SWAN ANNOTATED BIBLIOGRAPHY
03/22/2024

PUBLISHED MANUSCRIPTS

1 Solomon DH, Ruppert K, Cauley JA, Lian Y, Altwies H, Shieh A, Burnett-Bowie SM **The effect of starting metformin on bone mineral density among women with type 2 diabetes in the Study of Women's Health Across the Nation (SWAN)** Osteoporos Int. 2023 Sep 21. doi: 10.1007/s00198-023-06915-3. Online ahead of print. PMID: 37731055
Primary Question: Does the initiation of metformin, a commonly used drug, associate with worse bone mineral density?
Summary of Findings: Over four years of follow-up, women who initiated metformin had no important differences in bone mineral density compared with women who did not start metformin.
[WG#1107]

2 Dugan SA, Crawford SL, Wente K, Waetjen EL, Karvonen-Gutierrez C, Harlow SD **The Association of Urinary Incontinence and Disability Among a Diverse Sample of Mid-life SWAN Women** Menopause
Primary Question: Does the relationship over 2 years between Urinary Incontinence (UI) and Disability, differ by UI type?
Does the relationship over 2 years vary by UI frequency?
Does the relationship over 2 years vary by UI amount?

Summary of Findings: Urinary incontinence has strong association with multiple areas of disability after two years. It is important to address UI earlier in symptom onset. Screening for mixed UI (both Stress and Urge) and UI that occurs more frequently and in larger amounts more specifically may yield better information regarding an individual's future disability risk.
[WG#975]

3 Leis AM, Jackson EA, Baylin A,Barinas-Mitchell E, El Khoudary SR, Karvonen-Gutierrez CA **Carotid Intima Media Thickness and Comorbid Cardiometabolic Dysfunction in Women: The SWAN Study** Menopause
Primary Question: Do obesity and metabolic syndrome have unique effects on cardiovascular risk?
Summary of Findings: There are a significant proportion of metabolically healthy obese individuals within SWAN. The findings from this study suggest that there is only a minimal impact of obesity on carotid artery thickness over the effect of metabolic syndrome alone.
[WG#1034]

4 Qi M, Janssen I,Barinas-Mitchell E, Budoff, M, Brooks MM, Karlamangla AS,Derby CA, Chang CH, Shields KJ, El Khoudary SR **The quantity and quality of cardiovascular fat at midlife and future cognitive performance among women: The SWAN cardiovascular fat ancillary study** Alzheimers Dement 2023 Sep;19(9):4073-4083. doi: 10.1002/alz.13133. Epub 2023 May 22. PMID: 37212597
Primary Question:
1. Are lower volumes of epicardial adipose tissue and paracardial adipose tissue, higher

volume of thoracic perivascular adipose tissue, and better quality of all cardiovascular fat deposits at midlife associated with a higher future cognitive performance?

2. Does the effect of cardiovascular fat on cognitive performance depend on obesity or race/ethnicity?

Summary of Findings:
1. Higher thoracic perivascular adipose tissue volume and radiodensity at midlife were associated with higher future delayed recall and lower future working memory.

2. The effect of cardiovascular fat on cognitive performance did not depend on obesity and race/ethnicity.

[WG#1088]

5 Thurston R. **Vasomotor symptoms and cardiovascular health: findings from the SWAN and the MsHeart/MsBrain studies** Climacteric 2023 Aug 14;1-6. doi: 10.1080/13697137.2023.2196001. Online ahead of print. PMID: 37577812
Primary Question:
Summary of Findings: Using a range of methodologies and extensive consideration of confounders, these studies have shown that frequent and/or persistent VMS are associated with adverse CVD risk factor profiles, poorer underlying peripheral vascular and cerebrovascular health, and elevated risk for clinical CVD events.
[WG#1130]

6 DH Solomon, L Santacroce, AH Shadyab, B Haring, SM Burnett-Bowie, C Karvonen-Gutierrez, A Colvin, RD Jackson, MS LeBoff, K Ruppert, CI Valencia, NE Avis, JE Manson **Derivation and External Validation of a Risk Score for Clinically Important Declines in Health and Function Among Two Longitudinal Cohorts of Women in the Mid-Life** BMJ Open 2023 Aug 9;13(8):e069149. doi: 10.1136/bmjopen-2022-069149. PMID: 37558437 PMCID: PMC10414087
Primary Question: Can simple to collect variables be used to predict which women during the midlife will have significant declines over the decade from ages 55-65 years in physical health and function
Summary of Findings: Seven variables are moderate predictors of significant declines in two large representative cohorts of women in the midlife. These include baseline health, body mass index, educational attainment, smoking status, osteoarthritis, cardiovascular disease, and depressive symptoms. These variables work well as a risk score and should be considered in clinical settings.

Conclusions and relevance: Seven easy to collect clinical variables were used to create a valid risk score for PCS declines that was replicated in an external cohort of women. The risk score might provide a method for identifying women at high risk for a significant PCS decline in mid-life.
[WG#1058MS2]

7 Shieh A, Karlamangla A, Huang M, Shivappa N, Wirth M, Hebert J, Greendale G. **Dietary inflammatory index and fractures in midlife women: Study of Women's Health Across**

the Nation J Clin Endocrinol Metab 2023 Jul 14;108(8):e594-e602. doi: 10.1210/clinem/dgad051. PMID: 36780235 PMCID: PMC10348462
Primary Question: Is a more inflammatory diet related to more fractures?
Summary of Findings: A more inflammatory diet is related to more future fractures.
[WG#1075]

8 El Khoudary SR, Chen X, Wang Z, Brooks MM, Orchard T, Crawford S, Janssen I, Everson-Rose SA, McConnell D, Matthews K, **Low-density lipoprotein subclasses over the menopause transition and risk of coronary calcification and carotid atherosclerosis: The SWAN Heart & HDL Ancillary studies** Menopause
Primary Question: 1) Are LDL subclasses change over the menopause transition independent of aging?
2) Are LDL subclasses during midlife associated with the presence of coronary artery calcification and carotid intima-media thickness?
3) Will these associations vary by the timing of these measures as related to the final menstrual period (FMP)?

Summary of Findings: Women experience significant atherosclerotic increases in LDL subclasses that increases their risk of having greater cIMT levels and higher CAC prevalence. The reported associations were more profound during perimenopause stage.
[WG#1081]

9 Schiff MD, Mair CF, Barinas-Mitchell E, Brooks MM, Mendez DD, Naimi AI, Reeves A,Hedderson M, Janssen I, Fabio A **Longitudinal Profiles of Neighborhood Socioeconomic Vulnerability Influence Blood Pressure Changes Across the Female Midlife Period** Health Place 2023 Jul;82:103033. doi: 10.1016/j.healthplace.2023.103033. Epub 2023 May 2. PMID: 37141837 PMCID: PMC10407757
Primary Question: Does longitudinal exposure to neighborhood socioeconomic vulnerability throughout midlife impact blood pressure levels and their annual progression over time?
Summary of Findings: We used data from the Study of Women's Health Across the Nation to characterize longitudinal patterns of neighborhood socioeconomic vulnerability and sociodemographic change over time, and to determine their influence on blood pressure levels and their annual progression among women across ten-year follow-up. We identified four unique profiles of neighborhood socioeconomic vulnerability, and found that women living in socioeconomically vulnerable neighborhoods throughout midlife – characterized by lower SES, greater vacant housing, higher population density, and more non-Hispanic Black and Hispanic residents – had significantly higher SBP levels at study start, and experienced the fastest rate of annual SBP growth (at 0.93 mmHg/year) across ten-year follow-up. In our racially, ethnically, and geographically-diverse cohort of 2,738 women transitioning through menopause, neighborhood socioeconomic vulnerability was significantly associated with accelerated increases in systolic blood pressure throughout midlife.
[WG#1023]

10 Reeves AN, Elliott MR, Karvonen-Gutierrez C, Harlow SD **Selection Bias Masks Racial Differences in Age at Menopause: The Study of Women's Health Across the Nation** JAMA Open Network 2023 Jun 29;dyad085. doi: 10.1093/ije/dyad085. Online ahead of print. PMID: 37382579
Primary Question: Does selection into and out of the SWAN cohort bias estimates of

racial/ethnic differences in the age of final menstrual period (FMP)?
Summary of Findings: Overall selection biases cause overestimation of the median age of FMP in Black/Hispanic women, underestimating racial/ethnic disparities. After adjustment, Black women had earlier natural and surgical FMPs (average 1.2 years) versus White women despite control factors. Results are consistent with “weathering” and overuse of reproductive surgeries for Black/Hispanic women – highlighting that selection biases in aging research misinforms understanding of aging in minoritized populations.
[WG#956MS2]

11 Ding N, Karvonen-Gutierrez CA, Zota AR, Mukherjee B, Harlow SD, Park SK **The Role of Exposure to Per- and Polyfluoroalkyl Substances in Racial/Ethnic Disparities in Hypertension: Results from the Study of Women’s Health Across the Nation** Environ Res Ding N, Karvonen-Gutierrez CA, Zota AR, Mukherjee B, Harlow SD, Park SK. The role of exposure to per- and polyfluoroalkyl substances in racial/ethnic disparities in hypertension: Results from the study of Women's health across the nation. Environ Res. 2023 Jun 15;227:115813. doi: 10.1016/j.envres.2023.115813. Epub 2023 Mar 31. PMID: 37004857; PMCID: PMC10227830
Primary Question: Racial/ethnic disparities in hypertension are well-documented and a pressing public health problem. The contribution of environmental pollutants, including per- and polyfluoroalkyl substances (PFAS), have not been explored even though certain PFAS are higher in Black population and have previously been associated with hypertension incidence. We examined the extent to which racial/ethnic disparities in incident hypertension are explained by racial/ethnic differences in serum PFAS concentrations.
Summary of Findings: In this prospective cohort, PFAS were associated with significant and clinically meaningful race/ethnic differences in time to hypertension. A causal mediation analysis revealed that PFOS, and two precursors (EtFOSAA and MeFOSAA) explained around 7-10% of the differences observed in the time to onset of hypertension in Black compared to White participants. Using multipollutant approaches, we found PFAS mixtures could explain 19.1% of the Black-White disparities in hypertension.
[WG#877MS20]

12 Lange-Maia BS, El Khoudary SR, Crandall CJ, Zhang Y, Karvonen-Gutierrez CA, Gabriel KP, Appelhans BM, Strotmeyer ES, Ylitalo KR, Karavolos K, Kravitz HM, Dugan SA, Janssen I **Pre- and Early Perimenopausal Physical Function and Risk of Cardiovascular Events: The Study of Women’s Health Across the Nation**
J Aging Health Lange-Maia BS, El Khoudary SR, Crandall CJ, Zhang Y, Karvonen-Gutierrez CA, Gabriel KP, Appelhans BM, Strotmeyer ES, Ylitalo KR, Karavolos K, Kravitz HM, Dugan SA, Janssen I. Pre- and Early Peri-menopausal Physical Function and Risk of Cardiovascular Events: The Study of Women's Health Across the Nation. J Aging Health. 2023 Jun;35(5-6):383-391. doi: 10.1177/08982643221133580. Epub 2022 Oct 17. PMID: 36250945; PMCID: PMC10106523.
Primary Question: Do women with lower physical function during pre- or perimenopause have higher risk for a cardiovascular event compared to women with better physical function?
Summary of Findings: Women with lower physical function during pre- or perimenopause have higher risk of a cardiovascular event as they age. This association appears to be due to higher cardiovascular risk factors among women with lower physical function.
[WG#1019]

13 Cauley JA, Howard KM, Ruppert K, Lian Y, Hall MJ, Harlow SD, Finkelstein JS, Greendale G **Self-Reported Sleep disturbances over the menopausal transition and fracture risk: The Study of Women's Health Across the Nation (SWAN)** JBMR Plus 2023 May 27;7(8):e10762. doi: 10.1002/jbm4.10762. eCollection 2023 Aug. PMID: 37614302 PMCID: PMC10443076
Primary Question: Are Sleep Disturbances related to fractures as women transition over menopause?
Summary of Findings: We found that women with greater sleep disturbances have a higher risk of fracture but this association was explained by shared risk factors.
[WG#998]

14 Shieh A, Greendale GA, Cauley JA,, Karvonen-Gutierrez CA, Karlamangla AS **Prediabetes and Fracture Risk Among Midlife Women in the Study of Women's Health Across the Nation** JAMA Network Open Shieh A, Greendale GA, Cauley JA, Karvonen-Gutierrez CA, Karlamangla AS. Prediabetes and Fracture Risk Among Midlife Women in the Study of Women's Health Across the Nation. JAMA Netw Open. 2023 May 1;6(5):e2314835. doi: 10.1001/jamanetworkopen.2023.14835. PMID: 37219902; PMCID: PMC10208145
Primary Question:
Does having prediabetes increase the risk of bone fractures?

Summary of Findings: Having prediabetes increases the risk of future bone fractures in midlife women. This risk is independent of bone mineral density.
[WG#1111]

15 Santacroce LM, Avis NE, Colvin AB,Ruppert K, Karvonen-Gutierrez C,Solomon DH **Physical and Behavioral Factors Associated With Improvement in Physical Health and Function Among US Women During Midlife** JAMA Network Open 2023 May 1;6(5):e2311012. doi: 10.1001/jamanetworkopen.2023.11012. PMID: 37126345 PMCID: PMC10152304
Primary Question: Do women improve their physical health and function over time, and what are the factors associated with improvement?
Summary of Findings: Approximately 15% of women improved their physical health and function over time. Factors associated with improvement include having a higher physical activity score, lower BMI, no sleep disturbances, less financial strain, less medications, and lower baseline physical health and function.
[WG#1121]

16 Dooley EE, Winkles JF, Colvin A, Kline CE, Badon SE, Diaz KM, Karvonen-Gutierrez CA, Kravitz HM, Sternfeld B, Thomas JS, Hall MH, Gabriel KP **Method for Activity Sleep Harmonization (MASH): Harmonizing data from two wearable devices to estimate 24-hr movement cycles** J Act Sedentary Sleep Behav 2023;2:8. doi: 10.1186/s44167-023-00017-5. Epub 2023 Apr 5. PMID: 37694170 PMCID: PMC10492590
Primary Question: This is a methods paper to join together data from two different devices that measure physical activity during waking hours and sleep during night time hours and discusses the issues that arise when merging these data.
Summary of Findings: We developed a novel methodology – Method for Activity Sleep Harmonization (MASH) – to combine sleep watch data and activity waist data to create 24-hour sleep-wake cycles. MASH was developed as a two-tiered process that uses available diary data or, if diary data are not available, 1D convolutional neural network (1D CNN)

models are used to create predicted wake intervals. The process then reconciles sleep and activity data disagreement and creates day-level night-day pairs. Most of the reconciling between the sleep and activity data was due to the overlap between sedentary behavior and sleep (e.g., if the participant wore the activity device during sleep which was a protocol deviation).

[WG#1080]

17 Swanson LM, Hood MM, Hall MH, Avis NE, Joffe H, Colvin A, Ruppert K, Kravitz HM, Neal-Perry G, Derby CA, Hess R, Harlow SD **Sleep timing, sleep regularity, and psychological health in early late life women: Findings from the Study of Women's Health Across the Nation (SWAN).** Sleep Health Swanson LM, Hood MM, Hall MH, Avis NE, Joffe H, Colvin A, Ruppert K, Kravitz HM, Neal-Perry G, Derby CA, Hess R, Harlow SD. Sleep timing, sleep regularity, and psychological health in early late life women: Findings from the Study of Women's Health Across the Nation (SWAN). Sleep Health. 2023 Apr;9(2):203-210. doi: 10.1016/j.sleh.2022.11.001. Epub 2022 Dec 9. PMID: 36509657. PMCID: PMC10478033
Primary Question: Are sleep timing and regularity of sleep timing associated with psychological health?
Summary of Findings: Unhealthy sleep timing was associated with depressive symptoms. Irregular sleep was associated with depressive symptoms, anxiety symptoms, and worse psychological well-being.
[WG#1063]

18 Greendale GA, Jackson NJ, Shieh A, Cauley JA, Karvonen-Gutierrez C, Ylitalo KR, Gabriel KP, Sternfeld B, Karlamangla AS **Leisure time physical activity and bone mineral density preservation during the menopause transition and postmenopause : a longitudinal cohort analysis from the Study of Women's Health Across the Nation (SWAN)** The Lancet Regional Health - Americas Lancet Reg Health Am. 2023 Mar 26;21:100481. doi: 10.1016/j.lana.2023.100481. eCollection 2023 May. PMID: 37008197 PMCID: PMC10060105

Primary Question: In midlife women undergoing the menopause transition, does leisure time physical activity mitigate bone loss?

Summary of Findings: Larger increases in leisure time physical activity from pre-/early perimenopause to late perimenopause/postmenopause were associated with slower bone loss at the hip. More leisure time physical activity over the entire period spanning premenopause to postmenopause was associated with higher postmenopausal bone mineral density at the spine and hip.
[WG#1091]

19 Sanders WM, Harlow SD, Ylitalo KR, Lange-Maia BS, Leis AM, McConnell DS, Karvonen-Gutierrez CA **The Association of Inflammatory Factors With Peripheral Neuropathy: The Study of Women's Health Across the Nation.** J Clin Endocrinol Metab Sanders WM, Harlow SD, Ylitalo KR, Lange-Maia BS, Leis AM, McConnell DS, Karvonen-Gutierrez CA. The Association of Inflammatory Factors With Peripheral Neuropathy: The Study of Women's

Health Across the Nation. J Clin Endocrinol Metab. 2023 Mar 10;108(4):962-970. doi: 10.1210/clinem/dgac612. PMID: 36260527; PMCID: PMC10211489.
Primary Question: Are cardio-metabolic and inflammatory variables at baseline predictive of neuropathy in SWAN women at visit 15?
Summary of Findings: We found that baseline metabolic syndrome is a significant predictor of neuropathy even after control for obesity and diabetes. Longitudinal CRP was also strongly predictive even after control for all three metabolic conditions, and mediated the relationship between both obesity and metabolic syndrome with peripheral neuropathy
[WG#1055]

20 Avis NE, Crawford SL, Gold EB, Greendale GA **Sexual Functioning Among Breast Cancer Survivors and Non-Cancer Controls Over 5 Years Post Diagnosis: Pink SWAN** Cancer Medicine 2023 Mar;12(6):7356-7368. doi: 10.1002/cam4.5433. Epub 2022 Nov 28. PMID: 36440508; PMCID: PMC10067058
Primary Question: What is the time course of sexual functioning among breast cancer survivors following diagnosis compared to women without cancer over an equivalent period of time, and do risk factors for sexual functioning vary between cancer survivors and women without cancer?
Summary of Findings: Except for greater pain with intercourse among breast cancer survivors, negative changes in sexual function during mid-life were similar in those with and without cancer.
Both cancer survivors and con-cancer controls showed a decline over time in being sexually active, sexual intercourse frequency, and sexual desire. Characteristics such as depressive symptoms, previously related to sexual functioning among survivors, were similarly related to sexual functioning among women without cancer.

[WG#853]

21 Shieh A, Karlamangla AS, Karvonen-Guttierez CA, Greendale GA **Menopause-Related Changes in Body Composition Are Associated With Subsequent Bone Mineral Density and Fractures: Study of Women's Health Across the Nation** J Bone Miner Res J Bone Miner Res. 2023 Mar;38(3):395-402. doi: 10.1002/jbmr.4759. Epub 2023 Jan 17. PMID: 36542065; PMCID: PMC10023299.
Primary Question: What are the effects of lean mass loss and fat mass gain during the menopause transition on bone density at the end of the menopause transition and fracture in postmenopause?
Summary of Findings: Greater loss of lean during the menopause transition is associated with lower bone density at the hip at the end of the menopause transition, whereas greater gain in fat mass during the menopause transition is associated with greater bone density at the spine and hip. Both greater lean mass loss and fat mass gain during the menopause transition were associated with more fractures in postmenopause.
[WG#1068]

22 Dugan SA, Karavolos K, Zhang Y, Avery E, Janssen I, Farhi M, Harlow SD, Kravitz HM **Childhood Sexual Abuse and Pelvic Floor Dysfunction in Midlife Women in the Study of Women's Health Across the Nation** Journal of Women's Health Dugan SA, Karavolos K, Zhang Y, Avery E, Janssen I, Farhi M, Harlow SD, Kravitz HM. Childhood Sexual Abuse and Pelvic Floor Dysfunction in Midlife Women in the Study of Women's Health Across the Nation.

Journal of Women's Health. 2023 Mar 1;32(3):293-9. PMID: 36735600; PMCID: PMC9993161
Primary Question: Are women who have experienced childhood sexual trauma at greater risk for pelvic floor dysfunction as represented by urinary incontinence and/or pelvic pain during intercourse?
Summary of Findings: This analysis identified dyspareunia but not urinary incontinence as a significant midlife consequence of childhood sexual abuse. Clinicians who evaluate and treat pelvic floor dysfunctions should inquire about childhood sexual abuse.
[WG#959]

23 Peng MQ, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Park SK **Phthalates and Incident Diabetes in Midlife Women: The Study of Women's Health Across the Nation (SWAN)** J Clin Endocrinol Metab 2023 Feb 8;dgad033. doi: 10.1210/clinem/dgad033. Online ahead of print. PMID: 36752637 PMC10348472
Primary Question: Does exposure to phthalates increase the risk of diabetes over six years in midlife women?
Summary of Findings: Some phthalate metabolites were associated with a higher incidence of diabetes over six years, but the associations were inconsistent across racial/ethnic groups. Whether phthalates cause diabetes requires further investigation.
[WG#877MS21]

24 Park S, Ding N, Harlow SD, Mukherjee B, Randolph JF Jr, Zheutlin E **Associations between Repeated Measures of Urinary Phthalate Metabolites with Hormones and Timing of Natural Menopause** Journal of the Endocrine Society 2023 Feb 3;7(4):bvad024. doi: 10.1210/jendso/bvad024. eCollection 2023 Feb 9. PMID: 36846211 PMCID: PMC9945847
Primary Question: Are exposures to phthalates associated with hormones including estradiol, testosterone, FSH, SHBG, and AMH, and timing of natural menopause in midlife women?
Summary of Findings: We found that phthalates may affect circulating levels of testosterone in midlife women, especially in postmenopausal women, supporting antiandrogenic properties of phthalates.
[WG#878MS2]

25 Santoro NF, Flyckt R, Davis A, Finkelstein J, Crawford S, Sun F, Derby C, Morrison A, Sluss P, Zhang H **Anti-Mullerian Hormone (AMH) Decline in Women Undergoing Hysterectomy with and without Oophorectomy Compared to Natural Menopause: Study of Women's Health Across the Nation (SWAN)** Obstetrics & Gynecology 2023 Feb 1;141(2):331-340. doi: 10.1097/AOG.0000000000005049. Epub 2023 Jan 4. PMID: 36649324; PMCID: PMC9858351.
Primary Question: Does having a hysterectomy make menopause come earlier?
Summary of Findings: having a hysterectomy does not bring on menopause earlier than not having a hysterectomy. Women who have hysterectomies would have had a slightly later age at menopause than women who did not have hysterectomies if they hadn't had the surgery.
[WG#991 MS]

26 Jakubowski KP, Koffer RE, Matthews KA, Burnett-Bowie SM, Derby CA, Yu EW, Green R, Thurston RC **Psychosocial Impacts of the COVID-19 Pandemic on Women with Trauma**

Histories: Study of Women's Health Across the Nation (SWAN) Journal of Traumatic Stress Jakubowski KP, Koffer RE, Matthews KA, Burnett-Bowie SM, Derby CA, Yu EW, Green R, Thurston RC. Psychosocial impacts of the COVID-19 pandemic on women with trauma histories: Study of Women's Health Across the Nation (SWAN). J Trauma Stress. 2023 Feb;36(1):167-179. doi: 10.1002/jts.22896. Epub 2022 Dec 4. PMID: 36463566; PMCID: PMC9877990.

Primary Question:
The current study investigated whether pre-pandemic histories of childhood abuse or intimate partner violence (reported roughly 4-12 years prior to the COVID-19 pandemic) were prospectively related to elevated depression, anxiety, interpersonal conflict, and sleep problems during the pandemic among older women.

Summary of Findings:
[WG#1035]

27 Wang X, Ding N, Harlow SD, Randolph JF Jr, Mukherjee B, Gold EB, Park SK **Exposure to Heavy Metals and Hormone Levels in Midlife Women: the Study of Women's Health Across the Nation (SWAN)** Environ Pollut Wang X, Ding N, Harlow SD, Randolph JF Jr, Mukherjee B, Gold EB, Park SK. Exposure to heavy metals and hormone levels in midlife women: The Study of Women's Health Across the Nation (SWAN). Environmental Pollution. 2023 Jan 15;317:120740. PMID: 36436662; PMCID: PMC9897061

Primary Question:
Summary of Findings: In this prospective cohort study of 1,355 midlife women representing diverse racial/ethnic groups, a doubling of urinary metal concentration was associated with lower E2 levels by 2.2% (95% CI: -4.0%, -0.3%) for mercury and 3.6% (95% CI: -5.7%, -1.6%) for lead; higher FSH levels by 3.4% (95% CI: 0.9%, 5.9%) for lead; and higher SHBG levels by 3.6% (95% CI: 1.3%, 5.9%) for cadmium. No association was found between metals and testosterone levels.
[WG#878MS3]

28 Kang H, Calafat AM, Karvonen-Gutierrez CA, Park SK **Isomer-specific serum concentrations of perfluorooctane sulfonic acid (PFOS) among U.S. adults: Results from the National Health and Nutrition Examination Survey (NHANES) and the Study of Women's Health Across the Nation Multi-Pollutant Study (SWAN-MPS)** Environmental Science & Technology 2023 Jan 10;57(1):385-394. doi: 10.1021/acs.est.2c04501. Epub 2022 Dec 19. PMID: 36534511 PMCID: PMC10103141

Primary Question: - Does the ratio of concentrations of serum PFOS isomers differ by individual characteristics such as consumption of processed foods or fish/shellfish, drinking tap water, kidney health, or menopausal status?
- Does the ratio of concentrations of serum PFOS isomers differ by race/ethnicity?

Summary of Findings: We found that people with frequent fish/shellfish consumption, healthier kidney, and premenopausal status had relatively higher serum concentrations of linear PFOS isomer compared to branched PFOS isomers, while people with white race/ethnicity, frequent processed foods consumption, and drinking tap water had relatively lower serum concentrations of linear PFOS compared to branched PFOS isomers.

[WG#877MS19]

29 Peng MQ, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Park SK **Phthalate exposure is associated with more rapid body fat gain in midlife women: The Study of Women's Health Across the Nation (SWAN) Multi-Pollutant Study** Environmental Research Peng MQ, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Park SK. Phthalate exposure is associated with more rapid body fat gain in midlife women: The Study of Women's Health Across the Nation (SWAN) Multi-Pollutant Study. Environmental Research. 2023 Jan 1;216:114685. PMID: 36341787; PMCID: PMC9870605
Primary Question: Does exposure to phthalates cause faster increases in body weight, fat mass, and body fat percentage in women at midlife?
Summary of Findings: Exposure to some phthalates was associated with faster gains in body fat in midlife women, especially those who were normal/underweight at baseline.
[WG#877MS18]

30 Waetjen E, Crawford S, Gajer P, Brooks, M, Gold E, Reed B, Hess R, Ravel J. **Relationships Between the Vaginal Microbiota and Genitourinary Syndrome of Menopause Symptoms in Postmenopausal Women: The Study of Women's Health Across the Nation** Menopause
Primary Question: What is the distribution of vaginal microbiota (classified by community state types-CSTs) in a diverse cohort of postmenopausal women? What are the relationships among genitourinary syndrome of menopause symptoms (vaginal dryness, vulvovaginal irritation, sexual pain, dysuria, urinary urgency), CSTs, estrogen, and vaginal atrophy biomarkers (vaginal maturation index and vaginal pH)?
Summary of Findings: While close relationships exist among estrogen, the structure of the vaginal microbiota, vaginal atrophy biomarkers (vaginal maturation index and vaginal pH), sexual pain was the only genitourinary syndrome of menopause symptom associated with the structure of vaginal microbiota and vaginal atrophy biomarkers.
[WG#977MS1]

31 Carpenter JS, Cortés YI, Tisdale JE, Sheng Y, Jackson EA, Barinas-Mitchell E, Thurston RC **Palpitations across the menopause transition in SWAN: trajectories, characteristics, and associations with subclinical cardiovascular disease.** Menopause Carpenter JS, Cortés YI, Tisdale JE, Sheng Y, Jackson EA, Barinas-Mitchell E, Thurston RC. Palpitations across the menopause transition in SWAN: trajectories, characteristics, and associations with subclinical cardiovascular disease. Menopause. 2023 Jan 1;30(1):18-27. doi: 10.1097/GME.0000000000002082. Epub 2022 Oct 16. PMID: 36256921; PMCID: PMC9797427.

Primary Question: We explored trajectories of palpitations over time, their risk factors, and their associations with subclinical cardiovascular disease.
Summary of Findings: We identified three distinct trajectories of palpitations: high probability of palpitations in the peri- to early postmenopause diminishing in the late postmenopause (15.9% of women), moderate probability of palpitations in the peri- to early postmenopause diminishing in the late postmenopause (34.3%), and sustained low probability of palpitations (49.8%). The high probability group had more financial strain, and a more adverse reproductive and health-related profile at baseline. Palpitations trajectories were not related to atherosclerosis or arterial stiffness.

[WG#1053]

32 El Khoudary SR, Chen X, Qi M, Derby CA, Brooks MM, Thurston RC, Janssen I, Crawford S, Lee JS, Jackson EA, Chae CU, McConnell D, Matthews KA **The independent associations of anti-Müllerian hormone and estradiol levels over the menopause transition with lipids/lipoproteins: The study of women's health across the nation.** Journal of Clinical Lipidology 2023 Jan-Feb;17(1):157-167. doi: 10.1016/j.jacl.2022.11.008. Epub 2022 Nov 22. PMID: 36517413 PMCID: PMC9974763
Primary Question: 1) Are lower premenopausal AMH and greater declines in AMH levels over time associated with adverse lipid/lipoprotein profiles in women transitioning through menopause INDEPENDENT OF E2?
2) Are lower levels of AMH overtime associated with adverse changes in lipid profile early in the transition (e.g. during time elapsed between baseline and 1 year before FMP) INDEPENDENT OF E2?

Summary of Findings:
Lower premenopausal and/or greater declines in E2 over the MT were associated with an atherogenic lipid/lipoprotein profile, while lower premenopausal AMH and/or greater declines in AMH over the MT linked to a greater increase in HDL-C and apo A-1.

[WG#454B]

33 Jones G, Gold EB, El Khoudary SR, Janssen I, Johnson WO **Analysis of Multivariate Binary Longitudinal Data: Metabolic Syndrome During the Menopausal Transition** Statistics and its Interface
Primary Question: (1) Our goal was to develop a complex Bayesian joint model for baseline prevalence and longitudinal incidence of MetS components and to use this model to ascertain what factors are associated with prevalence of particular MetS components at baseline, and their incidence, if possible considering the complexity of the problem.
(2) Since we were able to accomplish (1), our next goal was to ascertain the effect of race/ethnicity on development of MetS modified by menopausal status.
(3) We also assessed the effect of particular MetS configurations at baseline on the predictive probabilities of particular MetS constellations using a Markov chain approach

Summary of Findings: Having central adiposity at baseline, alone or in combination with another MetS component, is the major factor that increases predictive probability of subsequent development of MetS. The predictive probability of development of MetS varies by race/ethnicity and is somewhat modified by menopausal transition stage. Later menopause is protective of developing component MetS.
[WG#1083]

34 Christmas M, Janssen I, Joffe H, Upchurch D, Santoro N, Kravitz H. **Menopause hormone therapy and complementary alternative medicine, quality of life, and racial/ethnic differences: the Study of Women's Health Across the Nation (SWAN)**
Menopause Christmas M, Janssen I, Joffe H, Upchurch D, Santoro N, Kravitz HM. Menopause hormone therapy and complementary alternative medicine, quality of life, and racial/ethnic differences: the Study of Women's Health Across the Nation (SWAN).

Menopause. 2022 Dec 1;29(12):1357-1364. doi: 10.1097/GME.0000000000002087. Epub 2022 Oct 16. PMID: 36256923; PMCID: PMC9901179.
Primary Question: To evaluate if quality of life differed by treatment (hormone therapy and complementary alternative medicine) in a large, diverse cohort of women with menopause-related symptoms.
Summary of Findings:
[WG#889]

35 Nasr A, Matthews KA, Brooks MM, Barinas-Mitchell E, Orchard T, Billheimer J, Wang NC, McConnell D, Rader DJ, El Khoudary SR **Early Midlife Cardiovascular Health Influences Future HDL Metrics in Women: The SWAN HDL Study** J Am Heart Assoc Nasr A, Matthews KA, Brooks MM, Barinas-Mitchell E, Orchard T, Billheimer J, Wang NC, McConnell D, Rader DJ, El Khoudary SR. Early Midlife Cardiovascular Health Influences Future HDL Metrics in Women: The SWAN HDL Study. J Am Heart Assoc. 2022 Nov;11(21):e026243. doi: 10.1161/JAHA.122.026243. Epub 2022 Oct 26. PMID: 36285790; PMCID: PMC9673623.
Primary Question: Is a better Life's Simple 7 (LS7) score and its health behavior components (body mass index, physical activity, smoking and diet) early in midlife associated with better metrics of HDL [higher HDL cholesterol efflux capacity (HDL-CEC), HDL-phospholipids (HDL-PL) and large HDL-particles (HDL-P) concentrations, larger HDL size, and less HDL triglycerides (HDL-Tg),medium and small HDL-P concentrations] later in life? Is a better LS7 score and its health behavior components (body mass index, physical activity, smoking and diet) early in midlife associated with favorable changes of HDL metrics over time?

Summary of Findings: After adjusting for confounders, a higher LS7 at baseline score was associated with higher HDL-PL, total HDL-P, and large HDL-P concentrations, lower HDL-Tg levels and larger overall HDL size later in life.

Ideal BMI was associated with higher HDL-CEC, HDL-PL and large HDL-P levels, larger HDL size and lower HDL-Tg and small HDL-P levels. Ideal physical activity status was associated with higher HDL-PL, total HDL-P, large HDL-P and medium HDL-P concentrations. Ideal smoking status was associated with lower HDL-Tg. Diet was not associated with any of the HDL metrics.

Higher baseline LS7 score was associated with a decrease in HDL size as time progressed. Compared to women with ideal BMI, women in the poor BMI group had larger increases in HDL size over time.

[WG#1048]

36 Wang X, Karvonen-Gutierrez CA, Gold EB, Derby C, Greendale G, Wu X, Schwartz J, Park SK **Longitudinal Associations of Air Pollution With Body Size and Composition in Midlife Women: The Study of Women's Health Across the Nation** Diabetes care 2022 Nov;45(11):2577-84. PMID: 36084038; PMCID: PMC9679268
Primary Question: Air pollution has been suggested to be associated with obesity; however, epidemiologic evidence is limited and has largely focused on body mass index (BMI). We examined longitudinal associations of air pollution exposure, including fine particulate matters (PM2.5), nitrogen dioxide (NO2), and ozone (O3) with weight, BMI, waist

circumference, fat mass, lean mass, and proportion fat mass in midlife women.
Summary of Findings: In this prospective cohort study of 1,654 midlife women representing diverse racial/ethnic groups, exposure to air pollution was associated with adverse changes in body composition measures. In particular, PM2.5 and NO2 were positively associated with fat mass and proportion fat mass, and inversely associated with lean mass. In addition, O3 was positively associated with proportion fat mass and inversely associated with lean mass. Associations of PM2.5 and NO2 with body size and composition were modified by physical activity; associations were attenuated among participants with higher physical activity levels.
[WG#1074]

37 Reeves A, Elliott MR, Lewis TT, Karvonen-Gutierrez CA, Herman WH, Harlow SD **Study Selection Bias and Racial or Ethnic Disparities in Estimated Age at Onset of Cardiometabolic Disease Among Midlife Women in the US** JAMA Netw Open Reeves A, Elliott MR, Lewis TT, Karvonen-Gutierrez CA, Herman WH, Harlow SD. Study Selection Bias and Racial or Ethnic Disparities in Estimated Age at Onset of Cardiometabolic Disease Among Midlife Women in the US. JAMA Netw Open. 2022 Nov 1;5(11):e2240665. doi: 10.1001/jamanetworkopen.2022.40665. PMID: 36342714; PMCID: PMC9641536
Primary Question: Is there a potential for selection into the SWAN cohort to bias estimates of racial/ethnic differences in health?
Summary of Findings: Black and Hispanic women had the lowest eligibility rates stemming from high rates of surgical menopause. Their eligibility rates decreased with increasing age at a higher rate than in White women. Higher education was associated with higher odds of eligibility for White women only. Participation was associated with demographic characteristics with little evidence of a “healthy volunteer” bias. Failure to account for selection at study commencement in the SWAN cohort, and similar cohorts of aging, may mis-estimate racial/ethnic disparities in health especially effecting Black and Hispanic women.
[WG#956]

38 Shieh A, Greendale GA, Cauley JA, Srikanthan P, Karlamangla AS **Longitudinal associations of insulin resistance with change in bone mineral density in midlife women** JCI Insight 2022 Oct 24;7(20):e162085. doi: 10.1172/jci.insight.162085. PMID: 36278482; PMCID: PMC9714784.
Primary Question: Does more insulin resistance lead to faster bone loss?

Summary of Findings: The longitudinal associations of insulin resistance with BMD were biphasic, and were more apparent in pre- and postmenopause than in the menopause transition. When insulin resistance is low and when it decreases, insulin resistance appears to be osteoanabolic. When insulin resistance increases, it appears to be osteocatabolic.
[WG#1071]

39 Bromberger JT, Chang Y, Colvin AB, Kravitz HM, Matthews KA. **Does childhood maltreatment or current stress contribute to increased risk for major depression during the menopause transition?** Psychol Med Bromberger JT, Chang Y, Colvin AB, Kravitz HM, Matthews KA. Does childhood maltreatment or current stress contribute to increased risk for major depression during the menopause transition? Psychol Med. 2022 Oct;52(13):2570-2577. doi: 10.1017/S0033291720004456. Epub 2020 Dec 10. PMID: 33298219.

PMC10329560.
Primary Question: Will women who experience various types of stressors, both historical (childhood adversity) or recent/current will be more likely to experience a major depressive episode during the MT (1) than women who do not report such stressors and (2) than during pre- or postmenopause.
Summary of Findings: Among women with lifetime major depression at study entry, compared to pre- or perimenopause, postmenopause poses a greater risk for a major depressive episode for women with childhood emotional abuse or neglect or physical neglect. This is not the case for women without lifetime major depression at study entry.
[WG#948]

40 Appelhans BM, Gabriel KP, Lange-Maia BS, Karavolos K, Ylitalo KR, Karvonen-Gutierrez CA, Kravitz HM, Janssen I **Longitudinal associations of midlife employment status with impaired physical function in the Study of Women's Health Across the Nation** Annals of Epidemiology Appelhans BM, Gabriel KP, Lange-Maia BS, Karavolos K, Ylitalo KR, Karvonen-Gutierrez CA, Kravitz HM, Janssen I. Longitudinal associations of mid-life employment status with impaired physical function in the Study of Women's Health Across the Nation. Ann Epidemiol. 2022 Oct;74:15-20. doi: 10.1016/j.annepidem.2022.06.001. Epub 2022 Jun 15. PMID: 35714876; PMCID: PMC10214385.

Primary Question: Is employment status a risk factor for poor physical function in midlife women?
Summary of Findings: Women with lower levels of employment from mid-life to older adulthood were more likely to experience severe impairment in physical function. These associations are not driven by adiposity, physical activity, or health-related variables.
[WG#1018]

41 El Khoudary SR, Chen X, McConnell D, Brooks MM, Billheimer J, Orchard TJ **Associations of HDL subclasses and lipid content with complement proteins over the menopause transition: The SWAN HDL ancillary study: HDL and complement proteins in women** J Clin Lipidol El Khoudary SR, Chen X, McConnell D, Brooks MM, Billheimer J, Orchard TJ. Associations of HDL subclasses and lipid content with complement proteins over the menopause transition: The SWAN HDL ancillary study: HDL and complement proteins in women. J Clin Lipidol. 2022 Sep-Oct;16(5):649-657. doi: 10.1016/j.jacl.2022.07.015. Epub 2022 Jul 31. PMID: 35987805.
Primary Question: Does C3 or C4 increase around the final menstrual period (FMP)? Are the changes in HDL subclasses over FMP associated with C3/C4 levels?

Summary of Findings: C3 and C4 significantly rise around menopause with C3 showing the steepest rise. Greater decreases in large and increases in small HDL-P concentrations and decreases in the overall size of HDL-P were independently associated with higher levels of C3 and C4 over time.
[WG#1005]

42 Goyal N, Levine BJ, Crawford SL, Avis NE **Sleep disturbance among breast cancer survivors and controls from midlife to early older adulthood: Pink SWAN** J Cancer Surviv 2022 Aug 18;10.1007/s11764-022-01247-3. doi: 10.1007/s11764-022-01247-3. Online

ahead of print. PMID: 35982358 PMCID: PMC9938082
Primary Question: To compare sleep disturbance from 5 years pre- to 5 years post-diagnosis between breast cancer survivors (BCS) and women without cancer over the same period and to identify BCS subgroups exhibiting different sleep trajectories
Summary of Findings: No differences were found between breast cancer survivors (BCS) and controls in prevalence of frequent nighttime awakenings either before or after diagnosis. Among BCS, three trajectory groups were identified. Thirty-seven percent of BCS had consistently low prevalence of waking several times per night, 30% had high prevalence and 33% had increasing prevalence which started 2 years pre-diagnosis. Pre-diagnosis vasomotor symptoms, anxiety, depressive symptoms, and smoking differed between the groups.
[WG#869]

43 Gold EB, Xing G, Avis NE, Harlow S, Joffe H, Matthews K, Pavlovic JM, Thurston RC, Waetjen E **The longitudinal relation of inflammation to incidence of vasomotor symptoms** Menopause Gold EB, Xing G, Avis NE, Harlow S, Joffe H, Matthews K, Pavlovic JM, Thurston RC, Waetjen E. The longitudinal relation of inflammation to incidence of vasomotor symptoms. Menopause. 2022 Aug 1;29(8):894-904. doi: 10.1097/GME.0000000000002005. PMID: 35905469; PMCID: PMC9346702.
Primary Question: 1. Are inflammatory biomarkers associated with subsequent incident VMS in women who did not report VMS at baseline?
2. Does the relation of inflammatory biomarkers to incident VMS vary by menopausal status or race/ethnicity?

Summary of Findings: Elevations of the inflammatory biomarkers, hs-CRP or IL-6, were not associated either concurrently or with subsequent incident VMS, indicating that inflammation was unlikely to be a risk factor for VMS.
[WG#858]

44 Grimes NP, Bertone-Johnson E, Whitcomb BW, Sievert LL, Crawford SL, Gold EB, Avis NE, Greendale GA, Santoro N, Habel LA, Reeves KW **Anti-Müllerian hormone levels and breast cancer risk in the study of women's health across the nation** Cancer Causes and Control Grimes NP, Bertone-Johnson E, Whitcomb BW, Sievert LL, Crawford SL, Gold EB, Avis NE, Greendale GA, Santoro N, Habel LA, Reeves KW. Anti-Müllerian hormone levels and breast cancer risk in the Study of Women's Health Across the Nation. Cancer Causes and & Control 2022;33(8):1039-1046. PMID: 35768642
Primary Question: Is there an association between premenopausal anti-Müllerian hormone levels and breast cancer risk?
Summary of Findings: Among 1,529 participants included in the analysis, 84 women self-reported an incident breast cancer diagnosis. In a multivariable Cox model adjusted for age, race/ethnicity, smoking, body mass index, and other factors, higher AMH levels were associated with a non-significant increased breast cancer risk.
[WG#895]

45 Ding N, Karvonen-Gutierrez CA, Mukherjee B, Calafat AM, Harlow SD, Park, SK. **Per- and Polyfluoroalkyl Substances and Incident Hypertension in Multi-Racial/Ethnic Women: The Study of Women's Health Across the Nation** Hypertension Ding N, Karvonen-Gutierrez CA, Mukherjee B, Calafat AM, Harlow SD, Park SK. Per- and Polyfluoroalkyl

Substances and Incident Hypertension in Multi-Racial/Ethnic Women: The Study of Women's Health Across the Nation. Hypertension. 2022 Aug;79(8):1876-1886. doi: 10.1161/HYPERTENSIONAHA.121.18809. Epub 2022 Jun 13. PMID: 35695012; PMCID: PMC9308661

Primary Question: Per- and polyfluoroalkyl substances (PFAS) can trigger a combination of pathophysiological responses that may lead to hypertension. However, human evidence to support this hypothesis is scant. We examined the association between PFAS and risks of developing hypertension.

Summary of Findings: We found that women with higher serum concentrations of perfluorooctane sulfonate (PFOS), perfluorooctanoate (PFOA), and 2-(N-ethyl-perfluorooctane sulfonamido) acetate (EtFOSAA) had a higher risk of developing hypertension. No significant associations were observed for perfluorononanoate (PFNA) and perfluorohexane sulfonate (PFHxS).

[WG#877MS14]

46 Qi M, Chen X, Krauss RM, Matthews K, Janssen I, Brooks MM, McConnell D, Crawford SL, El Khoudary SR **Lipoprotein subfractions and subclinical vascular health in middle aged women: does menopause status matter?** Menopause Qi M, Chen X, Krauss RM, Matthews K, Janssen I, Brooks MM, McConnell D, Crawford SL, El Khoudary SR. Lipoprotein subfractions and subclinical vascular health in middle aged women: does menopause status matter? Menopause. 2022 Aug 1;29(8):911-919. doi: 10.1097/GME.0000000000001998. Epub 2022 Jul 12. PMID: 35819840; PMCID: PMC9339472.

Primary Question:
Is there clear relationship between specific group of lipoproteins and subclinical atherosclerosis among perimenopausal women, after taking remaining lipoproteins into consideration? Does this relationship change by women's menopausal status?

Summary of Findings: Carotid intimal medial thickening is positively associated with a clusteri of small IDL particles in midlife women, and with a cluster of small and medium LDL particles after menopause.
[WG#1062]

47 Wang X, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Park SK **Metals and risk of incident metabolic syndrome in a prospective cohort of midlife women in the United States** Environ Res Wang X, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Park SK. Metals and risk of incident metabolic syndrome in a prospective cohort of midlife women in the United States. Environ Res. 2022 Jul;210:112976. doi: 10.1016/j.envres.2022.112976. Epub 2022 Feb 22. PMID: 35202625. PMCID: PMC9869389.

Primary Question: Exposure to metals may contribute to the development of metabolic syndrome (MetS); however, evidence from midlife women who are at greater risk of cardiometabolic disease is limited. We prospectively examined the associations of 15 urinary metal concentrations with incident MetS in the Study of Women’s Health Across the Nation Multi-Pollutant Study.

Summary of Findings: We found that women with higher urinary concentrations of arsenic, cobalt, and zinc were associated with higher incidence of MetS. Positive associations of urinary arsenic with high blood pressure and impaired fasting glucose, positive associations of urinary cobalt with high blood pressure and abdominal obesity, and positive associations of

urinary zinc with high blood pressure, impaired fasting glucose, abdominal obesity, and high triglyceride were also observed. A significant association between metal mixture and MetS was also observed using the Environmental Risk Score approach.
[WG#877MS16]

48 Kravitz HM, Colvin AB, Avis NE, Joffe H, Chen Y, Bromberger JT **Risk of high depressive symptoms after the final menstrual period: the Study of Women's Health Across the Nation (SWAN)**
Menopause 2022 Jul 1;29(7):805-815. doi: 10.1097/GME.0000000000001988. PMID: 35796553 PMCID: PMC9268212
Primary Question: To examine depressive symptoms during postmenopause and the contribution of depressive symptom trajectories prior to the final menstrual period (FMP) and psychosocial and health factors to postmenopause depressive symptoms.
Summary of Findings: Postmenopause remains a period of increased risk for higher depressive symptoms, especially for women with pre-FMP depressive symptoms. Compared to premenopause, postmenopause was associated with a greater odds of reporting depressive symptoms, but the odds of reporting high depressive symptoms did not differ significantly between postmenopause and early/late perimenopause. Pre-FMP depressive symptom trajectories are highly predictive of postmenopause depressive symptoms independent of health and psychosocial factors, and depressive symptoms tend to be highly consistent over midlife.
[WG#944]

49 Karlamangla AS, Shieh A, Greendale GA, Yu EW, Burnett-Bowie SM, Sluss PM, Martin D, Morrison A, Finkelstein JS **Anti-Mullerian Hormone as Predictor of Future and Ongoing Bone Loss During the Menopause Transition** Journal of Bone and Mineral Research
Karlamangla AS, Shieh A, Greendale GA, Yu EW, Burnett-Bowie SM, Sluss PM, Martin D, Morrison A, Finkelstein JS. Anti-Mullerian Hormone as Predictor of Future and Ongoing Bone Loss During the Menopause Transition. J Bone Miner Res. 2022 Jul;37(7):1224-1232. doi: 10.1002/jbmr.4525. Epub 2022 Apr 4. PMID: 35373854; PMCID: PMC9283201.

Primary Question: Q1. Does the serum level of AMH in a pre- or perimenopausal woman predict her rate of future BMD decline over the next 3 to 4 years?
Q2. Is the current level of serum AMH associated with the fraction of peak BMD that will have been lost after a few years, including both ongoing and imminent loss?
Summary of Findings: If a woman will lose more of her peak BMD than the site-specific least significant change (LSC) at either the lumbar spine or femoral neck by the end of the next 2-3 years, then AMH below 100 pg/mL will detect it with sensitivity of 50% in premenopause, 80% in early perimenopause, and 98% in late perimenopause. These findings suggest that AMH measurement can help flag women at the brink of significant bone loss, for early intervention
[WG#454C]

50 Ding N, Harlow SD, Randolph JF Jr, Mukherjee B, Batterman S, Gold EB, Park SK **Perfluoroalkyl Substances and Incident Natural Menopause in Midlife Women: The Mediating Role of Sex Hormones.** Am J Epidemiol Ding N, Harlow SD, Randolph JF, Mukherjee B, Batterman S, Gold EB, Park SK. Perfluoroalkyl Substances and Incident Natural Menopause in Midlife Women: The Mediating Role of Sex Hormones. Am J

Epidemiol. 2022 Jun 27;191(7):1212-1223. doi: 10.1093/aje/kwac052. PMID: 35292812; PMCID: PMC9393069.
Primary Question: Exposure to perfluoroalkyl and polyfluoroalkyl substances (PFAS) has been associated with earlier natural menopause, possibly through depletion of ovarian reserve and disturbance of hormone homeostasis. We aimed to investigate and quantify the degree to which follicle-stimulating hormone (FSH) and estradiol (E2) could mediate the associations between serum PFAS concentrations and incident natural menopause.
Summary of Findings: In this population-based cohort study, we found that the effects of exposure to PFAS on shortening time to incident natural menopause is partially explained through increasing serum concentrations of FSH. No mediation effects were observed for E2.
[WG#878]

51 Lee S, Karvonen-Gutierrez C, Mukherjee B, Herman WH, Park SK **Race-specific associations of urinary phenols and parabens with adipokines in midlife women: The Study of Women's Health Across the Nation (SWAN)** Environ Pollut. Lee S, Karvonen-Gutierrez C, Mukherjee B, Herman WH, Park SK. Race-specific associations of urinary phenols and parabens with adipokines in midlife women: The Study of Women's Health Across the Nation (SWAN). Environ Pollut. 2022 Jun 15;303:119164. doi: 10.1016/j.envpol.2022.119164. Epub 2022 Mar 16. PMID: 35306088.
Primary Question: We examined the cross-sectional associations of urinary phenols and parabens with adipokines. We also evaluated effect modification of these associations by race.

Summary of Findings: Urinary methyl-paraben was associated with lower leptin in all women but this association differed by race. Higher urinary concentrations of methyl-paraben were associated with a lower leptin in white women but with a higher leptin in black women. No significant associations were observed in Asian women.
[WG#877MS17]

52 Ylitalo K, Karvonen-Gutierrez C, Sternfeld B, Gabriel K. **Quantifying Physical Activity Across the Midlife: Does Consideration of Perceived Exertion Matter?** Prev Med Rep Ylitalo KR, Karvonen-Gutierrez CA, Oh M, Sternfeld B, Stamey J, Pettee Gabriel K. Quantifying physical activity across the midlife: Does consideration of perceived exertion matter? Prev Med Rep. 2022 Jun 10;28:101850. doi: 10.1016/j.pmedr.2022.101850. PMID: 35757579; PMCID: PMC9213249
Primary Question: Changes in heart rate and breathing during physical activity can influence perceptions of exertion. This study compared estimates of physical activity with and without adjustments for perceived exertion.
Summary of Findings: Approximately three-fourths of participants reported any planned exercise activities or sports during the previous year. The most common planned exercise activity for all participants was walking and the most common perceived exertion level was a “moderate” increase in heart rate and breathing during physical activity. For most women, adjusting for perceived exertion did not substantially change estimates of physical activity dose.
[WG#1028]

53 Waetjen LE, Johnson WO, Xing G, Hess R, Avis NE, Reed BD, Harlow SD, Dugan SA, Neal-Perry G, Gold EB. **Patterns of sexual activity and the development of sexual pain**

across the menopausal transition Obstetrics & Gynecology 2022 Jun 1;139(6):1130-1140. doi: 10.1097/AOG.0000000000004810. Epub 2022 May 2.PMID: 35675610 PMCID: PMC9199592
Primary Question: Do women who have declines in sexual intercourse frequency over the menopausal transition have a higher risk of developing sexual pain compared to women who have the same or increases in sexual intercourse frequency?
Summary of Findings: Long-term (over 13 years) and short-term (over 2 to 4 years) declines in reported sexual intercourse frequency across the menopausal transition were not associated with an increased risk of developing pain with intercourse. This empirical evidence does not support the “use it or lose it” notion that suggests women are responsible for their sexual pain.
[WG#929]

54 Hutchins F, El Khoudary SR, Catov J, Krafty R, Colvin A, Barinas-Mitchell E, Brooks MM **Excessive Gestational Weight Gain and Long-Term Maternal Cardiovascular Risk Profile: The Study of Women's Health Across the Nation** J Womens Health Hutchins F, El Khoudary SR, Catov J, Krafty R, Colvin A, Barinas-Mitchell E, Brooks MM. Excessive Gestational Weight Gain and Long-Term Maternal Cardiovascular Risk Profile: The Study of Women's Health Across the Nation. J Womens Health (Larchmt). 2022 Jun;31(6):808-818. doi: 10.1089/jwh.2021.0449. Epub 2022 Apr 18. PMID: 35442810; PMCID: PMC9245790.
Primary Question: Does excessive weight gain during pregnancy impact the long-term cardiovascular risk profile of the mother? And what proportion of that effect is explained by midlife obesity
Summary of Findings: A history of excessive gestational weight gain was associated with a small but statistically significant increase in atherosclerotic CVD risk score, and a moderate, statistically significant increase in level of the inflammatory marker C-reactive protein across midlife.
[WG#962]

55 Shieh A, Greendale GA, Cauley JA, Karvonen-Gutierriez C, Harlow SD, Finkelstein JS, Liao D, Huang MH, Karlamangla AS **Prediabetes and insulin resistance are associated with lower trabecular bone score (TBS): cross-sectional results from the Study of Women's Health Across the Nation TBS Study** Osteoporos Int 2022 Jun;33(6):1365-1372. doi: 10.1007/s00198-022-06325-x. Epub 2022 Feb 17. PMID: 35178609 PMCID: PMC9106606
Primary Question: Does prediabetes and insulin resistance reduce bone quality?
Summary of Findings: Prediabetes and insulin resistance are associated with reduced bone quality
[WG#972]

56 Verdiesen RMG, van der Schouw YT, van Gils CH, Verschuren WMM, Broekmans FJM, Borges MC, Gonçalves Soares AL, Lawlor DA, Eliassen AH, Kraft P, Sandler DP, Harlow SD, Smith JA, Santoro N, Schoemaker MJ, Swerdlow AJ, Murray A, Ruth KS, Onland-Moret NC. **Genome-wide association study meta-analysis identifies three novel loci for circulating anti-Müllerian hormone levels in women** Hum Reprod Verdiesen RMG, van der Schouw YT, van Gils CH, Verschuren WMM, Broekmans FJM, Borges MC, Gonçalves Soares AL, Lawlor DA, Eliassen AH, Kraft P, Sandler DP, Harlow SD, Smith JA, Santoro N, Schoemaker MJ, Swerdlow AJ, Murray A, Ruth KS, Onland-Moret NC. Genome-wide association study meta-analysis identifies three novel loci for circulating anti-Müllerian hormone levels in

women. Hum Reprod. 2022 May 3;37(5):1069-1082. doi: 10.1093/humrep/deac028. PMID: 35274129; PMCID: PMC9071229.
Primary Question: What genes are associated with variation in AMH levels in women with European Ancestry?
Summary of Findings: We identified a variant in the AMH gene and three other loci that may affect the size of the ovarian follicle pool: the previously reported MCM8 locus and three novel signals in or near AMH, TEX41, and CDCA7. The strongest signal was a missense variant in the AMH gene (rs10417628).
[WG#997]

57 Thurston RC, Chang Y, Matthews KA, Harlow S, El Khoudary SR, Janssen I, Derby C **Interpersonal Trauma and Risk of Incident Cardiovascular Disease Events Among Women** JAHA Thurston RC, Chang Y, Matthews KA, Harlow S, El Khoudary SR, Janssen I, Derby C. Interpersonal Trauma and Risk of Incident Cardiovascular Disease Events Among Women. J Am Heart Assoc. 2022 Apr 5;11(7):e024724. doi: 10.1161/JAHA.121.024724. Epub 2022 Mar 24. PMID: 35322675; PMCID: PMC9075461.
Primary Question: Is interpersonal violence [childhood abuse, adulthood abuse, intimate partner violence] related to increased risk of subsequent clinical CVD events?
Summary of Findings: Childhood abuse, particularly sexual abuse, was associated with increased risk of later CVD in women. IPV was associated with risk for CVD, and these relationships were explained in part by higher SBP among IPV-exposed women.
[WG#764]

58 Bielak LF, Peyser PA, Smith JA, Zhao W, Ruiz-Narvaez EA, Kardia SLR, Harlow SD **Multivariate, region-based genetic analyses of facets of reproductive aging in White and Black women** Mol Genet Genomic Med Bielak LF, Peyser PA, Smith JA, Zhao W, Ruiz-Narvaez EA, Kardia SLR, Harlow SD. Multivariate, region-based genetic analyses of facets of reproductive aging in White and Black women. Mol Genet Genomic Med. 2022 Apr;10(4):e1896. doi: 10.1002/mgg3.1896. Epub 2022 Feb 18. PMID: 35179313; PMCID: PMC9000932
Primary Question:
Summary of Findings:
[WG#994MS3]

59 Nasr A, Matthews K, Janssen I, Brooks MM, Barinas-Mitchell E, Orchard TJ, Billheimer J, Wang NC, McConnell D, Rader DJ, El Khoudary SR **Associations of Abdominal and Cardiovascular Adipose Tissue Depots With HDL Metrics in Midlife Women: the SWAN Study** JCEM Nasr A, Matthews K, Janssen I, Brooks MM, Barinas-Mitchell E, Orchard TJ, Billheimer J, Wang NC, McConnell D, Rader DJ, El Khoudary SR. Associations of Abdominal and Cardiovascular Adipose Tissue Depots With HDL Metrics in Midlife Women: the SWAN Study. J Clin Endocrinol Metab. 2022 May 17;107(6):e2245-e2257. doi: 10.1210/clinem/dgac148. PMID: 35298649; PMCID: PMC9113818.
Primary Question: Are higher volumes of abdominal visceral and cardiovascular (epicardial, paracardial and perivascular aortic) adipose tissue depots at midlife associated with a worse high-density lipoprotein (HDL) metric profile [lower HDL cholesterol efflux capacity (HDL-CEC), lower concentrations of HDL phospholipids (HDL-PL) and large HDL particles (HDL-P), smaller overall HDL size, and increases in levels of HDL triglycerides (HDL-Tg) and small HDL-P]?

Does insulin resistance mediate the observed associations between different adipose tissue depots and HDL metrics?
Summary of Findings: After adjusting for potential confounders, higher abdominal visceral adipose tissue volume was associated with lower concentrations of HDL-PL contents, HDL-cholesterol (HDL-C) and large HDL-P subclasses, and smaller overall HDL size.
Higher paracardial fat (PAT) volume was associated with lower concentrations of HDL-C and large HDL-P, and smaller overall HDL size. Higher epicardial fat (EAT) volume was associated with more small HDL-P concentrations. Higher perivascular aortic adipose tissue (PVAT) was associated with lower HDL-CEC.

Insulin resistance (IR) partially mediated the associations between adipose tissue depots and HDL metrics as following:
IR mediated the associations between HDL-CEC, HDL-C, large HDL-P, and HDL size. IR also mediated the associations between PAT and HDL-C, large HDL-P and HDL size, and the associations between PVAT and HDL-CEC.

[WG#1014]

60 Janssen I, Powell LH, Everson-Rose SA, Hollenberg SM, El Khoudary SR, Matthews KA **Psychosocial Well-Being and Progression of Coronary Artery Calcification in Midlife Women** JAHA Janssen I, Powell LH, Everson-Rose SA, Hollenberg SM, El Khoudary SR, Matthews KA. Psychosocial Well-Being and Progression of Coronary Artery Calcification in Midlife Women. J Am Heart Assoc. 2022 Mar;11(5):e023937. doi: 10.1161/JAHA.121.023937. Epub 2022 Feb 22. PMID: 35191325; PMCID: PMC9075088.
Primary Question: Are psychosocial protective factors related to slower progression of CAC over 2.3 years, independently of standard health behaviors and CV health (risk) factors?
Summary of Findings: A summary score of positive psychosocial factors was significantly inversely related to CAC progression. This association was stronger in women with presence of coronary calcium at baseline, even after accounting for standard health behaviors and CV health (risk) factors.
[WG#705]

61 Solomon DH, Santacroce L, Colvin A, Lian Y, Ruppert K, Yoshida K. **The relationship between 19-year trends in medication use and changes in physical function among women in the mid-life: A Study of Women's Health Across the Nation pharmacoepidemiology study.** Pharmacoepidemiology and Drug Safety Solomon DH, Santacroce L, Colvin A, Lian Y, Ruppert K, Yoshida K. The relationship between 19-year trends in medication use and changes in physical function among women in the mid-life: A Study of Women's Health Across the Nation pharmacoepidemiology study. Pharmacoepidemiol Drug Saf. 2022 Mar;31(3):283-293. doi: 10.1002/pds.5355. Epub 2021 Sep 21. PMID: 34496108; PMCID: PMC8825744.
Primary Question: We determined the impact of increasing medication use on health and function in women going through the mid-life.
Summary of Findings: There is a moderate correlation between increasing medication use and decreasing physical health and function among women transitioning through the mid-life. These details inform interventions to reduce declines in health and function in older women.
[WG#955]

62 Napoleone JM, Boudreau RM, Lange-Maia BS, El Khoudary SR, Ylitalo KR, Kriska AM, Karvonen-Gutierrez CA, Strotmeyer ES **Metabolic Syndrome Trajectories and Objective Physical Performance in Mid-to-Early Late Life: The Study of Women's Health Across the Nation (SWAN).** Gerontol A Biol Sci Med Sci. Napoleone JM, Boudreau RM, Lange-Maia BS, El Khoudary SR, Ylitalo KR, Kriska AM, Karvonen-Gutierrez CA, Strotmeyer ES. Metabolic Syndrome Trajectories and Objective Physical Performance in Mid-to-Early Late Life: The Study of Women's Health Across the Nation (SWAN). J Gerontol A Biol Sci Med Sci. 2022 Feb 3;77(2):e39-e47. doi: 10.1093/gerona/glab188. PMID: 34216218; PMCID: PMC8824556.
Primary Question: Do patterns of metabolic syndrome during midlife impact physical performance in early old age?
Summary of Findings: SWAN women with =3 metabolic syndrome (MetS; high-MetS) components compared to those with no MetS components had higher body mass index, pain, financial strain, and lower physical activity and self-reported health at visit 15 ($p<0.0001$). Compared to Caucasian women, African American and Hispanic women were more likely to be in the high-MetS group and had worse physical functioning along with Chinese women (SPPB, chair stand, stair climb, and gait speed but Hispanic women did not have worse gait speed). After adjustments, high-MetS compared to no MetS demonstrated significantly worse 40-ft walk (ß: -0.08; 95% CI: -0.13, -0.03), 4-m gait speed (ß: -0.09; 95% CI: -0.15, -0.02), SPPB (ß: -0.79; 95% CI: -1.15, -0.44), and chair stands (ß:0.69; 95% CI: 0.09, 1.28), though worse stair climb was not significant after adjustments. Excluding women with previous moderate or severe perceived physical function limitations did not change final models.
[WG#1012]

63 Lehrer HM, Yao Z, Krafty RT, Evans MA, Buysse DJ, Kravitz HM, Matthews KA, Gold EB, Harlow SD, Samuelsson LB, Hall MH **Comparing polysomnography, actigraphy, and sleep diary in the home environment: The Study of Women's Health Across the Nation (SWAN) Sleep Study** Sleep Advances Lehrer HM, Yao Z, Krafty RT, Evans MA, Buysse DJ, Kravitz HM, Matthews KA, Gold EB, Harlow SD, Samuelsson LB, Hall MH. Comparing polysomnography, actigraphy, and sleep diary in the home environment: The Study of Women's Health Across the Nation (SWAN) Sleep Study. Sleep Adv. 2022 Feb 19;3(1):zpac001. doi: 10.1093/sleepadvances/zpac001. PMID: 35296109; PMCID: PMC8918428.
Primary Question: How do different types of sleep measures compare to one another when used in the home environment? Does the agreement between measures differ by race/ethnicity?
Summary of Findings: Actigraphy and polysomnography produced similar estimates of sleep duration and sleep efficiency. Indices of sleep duration and sleep continuity measured by sleep diaries were consistently different than when measured by actigraphy and polysomnography. Differences in estimates of sleep continuity between sleep diaries and polysomnography were not uniform across race/ethnicity.
[WG#420]

64 Harlow SD, Burnett-Bowie SM, Greendale GA, Avis NE, Reeves AN, Richards TR, Lewis TT **Disparities in Reproductive Aging and Midlife Health between Black and White women: The Study of Women's Health Across the Nation (SWAN).** Womens Midlife Health 2022 Feb 8;8(1):3. PMID: 35130984; PMCID: PMC8822825.

Primary Question: How do SWAN findings help us understanding racial/ethnic health disparities in women's midlife health?
Summary of Findings: This SWAN story documents the presence, magnitude, and longitudinal patterns of racial disparities in selected areas of women's midlife health (menopause symptoms, sleep, mental health, health-related quality of life, cardio-metabolic health, and physical function) and considers the contextual factors that are likely influencing these disparities.
[WG#1061]

65 Samargandy S, Matthews KA, Brooks MM, Barinas-Mitchell E, Magnani JW, Thurston RC, El Khoudary SR **Trajectories of Blood Pressure in Midlife Women: Does Menopause Matter?** Circulation Research Samargandy S, Matthews KA, Brooks MM, Barinas-Mitchell E, Magnani JW, Thurston RC, El Khoudary SR. Trajectories of Blood Pressure in Midlife Women: Does Menopause Matter? Circ Res. 2022 Feb 4;130(3):312-322. doi: 10.1161/CIRCRESAHA.121.319424. Epub 2022 Jan 6. PMID: 35113663; PMCID: PMC8814466.
Primary Question: Do women form distinct groups of SBP, DBP, AND PP over time relative to the FMP?
Do some groupd of SBP, DBP, AND PP have a piecewise-linear relation with time relative to the FMP suggesting a contribution of the menopause transition?
Do menopause-related factors predict blood pressure trajectory membership or shape?

Summary of Findings: Women were classified into either low, medium, or high trajectory group in each BP measure. The low SBP and PP trajectories (in 36% and 52% of the cohort, respectively) were rising slowly before menopause but showed a significant accelerated rise 1 year after menopause, indicating a menopause contribution. The remaining BP trajectories were rising up until menopause and either continued with the same rise or declined after menopause. A younger menopause age predicted the low SBP and PP trajectories. A greater FSH level predicted a lower, while vasomotor symptoms occurrence predicted a higher SBP and PP levels overtime. Estradiol did not predict trajectory or level of any BP measure.
[WG#993]

66 Koffer RE, Thurston RC, Bromberger JT, Matthews KA **Racial/Ethnic Differences in Women's Life Event Exposure Across Midlife** J Gerontol B Psychol Sci Soc Sci Koffer RE, Thurston RC, Bromberger JT, Matthews KA. Racial/Ethnic Differences in Women's Life Event Exposure Across Midlife. J Gerontol B Psychol Sci Soc Sci. 2022 Feb 3;77(2):272-283. doi: 10.1093/geronb/gbab024. PMID: 33560407; PMCID: PMC8824596.
Primary Question: The present study aimed to identify levels and change in stressful life events across midlife in women and to understand racial/ethnic differences in these experiences. We examine change in total annual number of stressful life events and occurrence of various specific life events.
Summary of Findings: Number of annual life events declined with age and plateaued in later midlife. This pattern was largely consistent across types of life events, though family health and bereavement-related life events increased in later midlife. Compared to White women, Black women experienced more life events, Chinese and Japanese women experienced fewer life events, and Hispanic women experienced fewer life events but experienced increased life events in later midlife.
[WG#963]

67 Shieh A, Ruppert KM, Greendale GA, Lian Y, Cauley JA, Burnett-Bowie SA, Karvonen-Guttierez C, Karlamangla AS **Associations of Age at Menopause With Postmenopausal Bone Mineral Density and Fracture Risk in Women** The Journal of Clinical Endocrinology & Metabolism Shieh A, Ruppert KM, Greendale GA, Lian Y, Cauley JA, Burnett-Bowie SA, Karvonen-Guttierez C, Karlamangla AS. Associations of Age at Menopause With Postmenopausal Bone Mineral Density and Fracture Risk in Women. J Clin Endocrinol Metab. 2022 Jan 18;107(2):e561-e569. doi: 10.1210/clinem/dgab690. PMID: 34537850; PMCID: PMC8764341
Primary Question:
Summary of Findings: Becoming postmenopausal at a younger age is associated with lower postmenopausal bone mineral density, and greater risk of future fracture.
[WG#992]

68 Solomon DH, Colvin A, Lange-Maia BS, Derby C, Dugan S, Jackson EA, Ruppert K, Karvonen-Gutierrez C, Santacroce L, Strotmeyer ES, Avis NE. **Factors Associated With 10-Year Declines in Physical Health and Function Among Women During Midlife.** JAMA Open Network Solomon DH, Colvin A, Lange-Maia BS, Derby C, Dugan S, Jackson EA, Ruppert K, Karvonen-Gutierrez C, Santacroce L, Strotmeyer ES, Avis NE. Factors Associated With 10-Year Declines in Physical Health and Function Among Women During Midlife. JAMA Netw Open. 2022 Jan 4;5(1):e2142773. doi: 10.1001/jamanetworkopen.2021.42773. PMID: 35006247; PMCID: PMC8749479.
Primary Question: Can women's characteristics measured during their 50's predict declines in older adults?
Summary of Findings: Variables measured at age 55 have a moderate to strong correlation with clinically important declines in physical health and function at age 65. Variables include comorbidities, sociodemographic factors, and lifestyles issues.
[WG#1058]

69 Johannesdottir F, Putman MS, Burnett-Bowie SM, Finkelstein JS, Yu EW, Bouxsein ML **Age-Related Changes in Bone Density, Microarchitecture, and Strength in Postmenopausal Black and White Women: The SWAN Longitudinal HR-pQCT Study** J Bone Miner Res Johannesdottir F, Putman MS, Burnett-Bowie SM, Finkelstein JS, Yu EW, Bouxsein ML. Age-Related Changes in Bone Density, Microarchitecture, and Strength in Postmenopausal Black and White Women: The SWAN Longitudinal HR-pQCT Study. J Bone Miner Res. 2022 Jan;37(1):41-51. doi: 10.1002/jbmr.4460. Epub 2021 Nov 9. PMID: 34647644; PMCID: PMC8770571.
Primary Question: Are age-related declines in bone density, microarchitecture and strength at radius and tibia similar in Black and White postmenopausal women? Do body weight, body composition, physical activity and/or weight change modify age-related skeletal declines?
Summary of Findings: Postmenopausal Black women experience similar rates of skeletal decline as White women. Having low body weight or weight loss increases bone microarchitectural loss in postmenopausal women.
[WG#601G]

70 El Khoudary SR, Nasr A, Billheimer J, Brooks MM, McConnell D, Crawford S, Orchard TJ, Rader DJ, Matthews KA **Associations of Endogenous Hormones With HDL Novel Metrics Across the Menopause Transition: The SWAN HDL Study** Journal of Clinical

Endocrinology and Metabolism El Khoudary SR, Nasr A, Billheimer J, Brooks MM, McConnell D, Crawford S, Orchard TJ, Rader DJ, Matthews KA. Associations of Endogenous Hormones With HDL Novel Metrics Across the Menopause Transition: The SWAN HDL Study. J Clin Endocrinol Metab. 2022 Jan 1;107(1):e303-e314. doi: 10.1210/clinem/dgab595. PMID: 34390340; PMCID: PMC8684446

Primary Question: Are levels of estradiol (E2) and/or follicle-stimulating hormones (FSH) over the menopause transition associated with an adverse HDL metric profile [lower HDL cholesterol efflux capacity (HDL-CEC), lower concentrations of HDL phospholipids (HDL-PL) and large HDL particles (HDL-P), smaller overall HDL size, and increases in levels of HDL triglycerides (HDL-Tg) and small HDL-P]? Do these associations vary by time since menopause?

Summary of Findings:

Higher levels of estradiol are associated with larger HDL particle size, higher levels of large HDL-P, HDL-CEC and HDL-Tg, but with lower levels of medium HDL-P. The positive association between E2 and HDL-Tg was stronger 2 years after the final menstrual period (FMP) than before. FSH was related to higher total and medium HDL-P, but with smaller HDL particle size, and lower concentrations of large HDL-P, and HDL-CEC per particle. The associations of higher FSH with greater total HDL-P and smaller HDL size were only evident at or after menopause.

[WG#1040]

71 Gold EB, Crawford SL, Leung K, Greendale G, Reeves KW, Joffe H, Avis NE **Vasomotor symptoms in midlife women with incident breast cancer: pink SWAN. Breast Cancer Res Treat** Breast Cancer Research and Treatment Gold EB, Crawford SL, Leung K, Greendale G, Reeves KW, Joffe H, Avis NE. Vasomotor symptoms in midlife women with incident breast cancer: pink SWAN. Breast Cancer Res Treat. 2022 Jan;191(1):125-135. doi: 10.1007/s10549-021-06425-y. Epub 2021 Oct 25. PMID: 34694536; PMCID: PMC8758653.

Primary Question: 1. What is the time course of vasomotor symptoms (VMS) among women who developed incident breast cancer during follow-up in SWAN before and after their diagnosis and treatment?

2. Are rates of VMS higher in women who developed incident breast cancer during SWAN follow-up than in non-cancer controls from the SWAN cohort?

3. Does treatment with anti-estrogens, endocrine medications, and/or hysterectomy and/or oophorectomy in women who developed incident breast cancer during SWAN follow-up result in greater VMS reporting post-treatment?

4. Do the risk factors for VMS following breast cancer diagnosis differ from those for non-cancer controls?

Summary of Findings: Patterns of prevalent VMS reporting differed significantly between cases and controls, particularly post-diagnosis, the latter only partially explained by tamoxifen use among cases. Incident VMS had small numbers post-diagnosis and a lower rate in cases than in controls pre-diagnosis. Risk factors for VMS largely did not differ between cases and controls.

[WG#835]

72 Darssan D, Mishra GD, Greenwood DC, Sandin S, Brunner EJ, Crawford SL, El Khoudary SR, Brooks MM, Gold EB, Simonsen MK, Chung HF, Weiderpass E, Dobson AJ **Meta-**

analysis for individual participant data with a continuous exposure: A case study. Journal of Clinical Epidemiology Darssan D, Mishra GD, Greenwood DC, Sandin S, Brunner EJ, Crawford SL, El Khoudary SR, Brooks MM, Gold EB, Simonsen MK, Chung HF, Weiderpass E, Dobson AJ. Meta-analysis for individual participant data with a continuous exposure: A case study. J Clin Epidemiol. 2021 Dec;140:79-92. doi: 10.1016/j.jclinepi.2021.08.033. Epub 2021 Sep 4. PMID: 34487835.
Primary Question:
Summary of Findings:
[WG#1031PUD]

73 Kolli A, Hood MM, Karvonen-Gutierrez C, Moroi SE, Ehrlich JR, Gillespie BW, Dougherty Wood S, Musch DC **Midlife Vision Impairment and Cognitive Function in Later Life: The Study of Women's Health Across the Nation, Michigan Cohort** J Gerontol A Biol Sci Med Sci 2021 Nov 15;76(12):2178-2186. doi: 10.1093/gerona/glab180. PMID: 34153092 PMCID: PMC8598988
Primary Question: Prior studies have suggested that poor vision in later life is associated with worse cognitive function. We aim to assess whether there is a similar relationship between vision in mid-life and future cognitive function.
Summary of Findings: Moderate or worse vision impairment, assessed during mid-life, was associated with lower scores on measures of cognitive function over a 13 year period during which women transitioned from mid-life to later adulthood. Prior studies have suggested a relationship between vision and cognition in older age; this study supports an analogous relationship in mid-life.
[WG#1027]

74 Matthews KA, Lee L, Kravitz HM, Joffe H, Neal-Perry G, Swanson LM, Evans MA, Hall MH **Influence of the menopausal transition on polysomnographic sleep characteristics: a longitudinal analysis** Sleep Matthews KA, Lee L, Kravitz HM, Joffe H, Neal-Perry G, Swanson LM, Evans MA, Hall MH. Influence of the menopausal transition on polysomnographic sleep characteristics: a longitudinal analysis. Sleep. 2021 Nov 12;44(11):zsab139. doi: 10.1093/sleep/zsab139. PMID: 34081126; PMCID: PMC8598193
Primary Question: Does change in menopausal status influence change in PSG-assessed sleep across 3 to 4 years? Does the change vary by race/ethnicity?
Summary of Findings: Among women who were pre- or early-perimenopause at the first sleep assessment, those who transitioned to late perimenopause or postmenopause did not change in sleep duration, wake after sleep onset, NREM and REM delta power, and REM beta power, compared to those who remained pre- or earl perimenopause at the second sleep assessment. Women who transitioned did increase in NREM beta power. Findings were adjusted for age, race/ethnicity, site, interval between assessments, and within woman assessment. In addition, for NREM beta power body mass index, depressive symptoms and insomnia yes/no were covariates. Race/ethnicity only moderated the impact of transition group on sleep duration.
[WG#990]

75 Karvonen-Gutierrez CA, Kumar N, Hood MM, Musch DC, Harlow S, Moroi SE **Longitudinal association of midlife vision impairment and depressive symptoms: the study of Women's Health Across the Nation, Michigan site** Menopause
Primary Question: Is midlife vision impairment associated with depressive symptoms?

Summary of Findings: Vision impairment was associated with depressive symptoms during the midlife years. There was a significant longitudinal association of mild vision impairment with depressive symptoms among midlife women. Effect size of association of vision impairment and depressive symptoms attenuated but remained significant over time.
[WG#921]

76 El Khoudary SR, Qi M, Chen X, Matthews K, Allshouse AA, Crawford SL, Derby CA, Thurston RC, Kazlauskaite R, Barinas-Mitchell E, Santoro N **Patterns of menstrual cycle length over the menopause transition are associated with subclinical atherosclerosis after menopause** Menopause Menopause. 2021 Oct 11;29(1):8-15. doi: 10.1097/GME.0000000000001876. PMID: 34636354. PMCID: PMC9178927
Primary Question: 1. Are there distinct patterns of changes in menstrual cycle length over the menopausal transition among midlife women?
2. Are patterns of changes in cycle length associated with risk of atherosclerosis after menopause?

Summary of Findings: 1. Three distinct patterns of changes in menstrual cycle length over the menopausal transition was identified: stable, late increase, and early increase in cycle length.
2. Compared with women with stable pattern, women with the late increase pattern had lower risk of developing atherosclerosis after menopause.

[WG#899]

77 Park SK, Wang X, Ding N, Karvonen-Gutierrez CA, Calafat AM, Herman WH, Mukherjee B, Harlow SD **Per- and Polyfluoroalkyl Substances (PFAS) and Incident Diabetes in Midlife Women: the Study of Women's Health Across the Nation (SWAN)**
Primary Question: Do higher concentrations of serum PFAS increase the risk of developing diabetes?
How many new cases of diabetes in the United States annually could be prevented if serum concentrations of total PFAS were reduced to the background level?

Summary of Findings: We found that women with higher serum concentrations of perfluorooctanoate (PFOA), perfluorooctane sulfonate (PFOS), perfluorohexane sulfonate (PFHxS), and 2-(N-methyl-perfluorooctane sulfonamido) acetate (MeFOSAA) had higher risk of developing diabetes. In the United States approximately 370,000 incident diabetes cases each year are attributable to PFAS exposure.
[WG#877MS15]

78 El Khoudary SR, Nasr A, Matthews KA, Orchard TJ, Brooks MM, Billheimer J, McConnell D, Janssen I, Everson-Rose SA, Crawford S, Rader DJ **Associations of HDL metrics with coronary artery calcium score and density among women traversing menopause** Journal of Lipid Research El Khoudary SR, Nasr A, Matthews KA, Orchard TJ, Brooks MM, Billheimer J, McConnell D, Janssen I, Everson-Rose SA, Crawford S, Rader DJ. Associations of HDL metrics with coronary artery calcium score and density among women traversing menopause. J Lipid Res. 2021;62:100098. doi: 10.1016/j.jlr.2021.100098. Epub 2021 Jul 22. PMID: 34303684; PMCID: PMC8385165
Primary Question: Are different metrics of HDL associated with CAC presence or CAC

density, and does menopausal stage modify the association of HDL metrics with CAC presence and CAC density?
Summary of Findings: Only medium HDL-particle (HDL-P) concentrations was independently associated with
Higher odds of CAC presence; none of the HDL metrics were associated with CAC density. However, menopause status modified the associations between HDL metrics and measures of CAC, where higher small HDL-P and smaller overall HDL size were associated with higher odds of CAC presence in the late perimenopausal stage compared to the pre/early perimenopause stage. Lower large HDL-P and smaller overall HDL size were associated with lower CAC density in the late perimenopausal stage.

[WG#1000]

79 Greendale GA, Han W, Finkelstein JS, Burnett-Bowie SM, Huang M, Martin D, Karlamangla AS **Changes in Regional Fat Distribution and Anthropometric Measures Across the Menopause Transition** J Clin Endocrinol Metab Greendale GA, Han W, Finkelstein JS, Burnett-Bowie SM, Huang M, Martin D, Karlamangla AS. Changes in Regional Fat Distribution and Anthropometric Measures Across the Menopause Transition. J Clin Endocrinol Metab. 2021 Aug 18;106(9):2520-2534. doi: 10.1210/clinem/dgab389. PMID: 34061966; PMCID: PMC8372653.

Primary Question:
Does the menopause transition (MT) influence regional fat distribution and waist and hip circumferences?
Summary of Findings: The transition from pre- to postmenopause is accompanied by an increase in central fat stores and a decrease in peripheral fat stores. Accelerated gains in visceral, android and gynoid fat mass are associated with the onset of the MT. There are no similar changes in the rates of waist or hip circumference during the MT.
[WG#1017]

80 Wang X, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Harlow SD, Park SK. **Urinary Heavy Metals and Longitudinal Changes in Blood Pressure in Midlife Women: The Study of Women's Health Across the Nation** Hypertension 2021 Aug;78(2):543-551. doi: 10.1161/HYPERTENSIONAHA.121.17295. Epub 2021 Jun 21. PMID: 34148361; PMCID: PMC8266752.
Primary Question: Environmental exposure to heavy metals may contribute to increased blood pressure, however, evidence from midlife women who are at greater risk of cardio-metabolic disease, is limited. We evaluated the associations of urinary concentrations of arsenic, cadmium, mercury, and lead with longitudinal changes in blood pressure in the Study of Women's Health Across the Nation Multi-Pollutant Study.
Summary of Findings: After multivariable adjustment, estimated annualized increases (95%CI) in SBP in the highest and lowest tertiles were 0.93 (0.85, 1.01) mmHg and 0.74 (0.66, 0.82) mmHg for arsenic, 0.82 (0.75, 0.90) mmHg and 0.72 (0.65, 0.80) mmHg for mercury, and 0.86 (0.78, 0.93) mmHg and 0.72 (0.64, 0.79) mmHg for lead, respectively. Similar results were observed for associations of arsenic, mercury, lead with DBP. Urinary cadmium was associated with a greater rate of increase in SBP only among never smokers.
[WG#877MS13]

81 Bowman MA, Kline CE, Buysse DJ, Kravitz HM, Joffe H, Matthews KA, Bromberger JT, Roecklein KA, Krafty RT, Hall MH **Longitudinal Association Between Depressive Symptoms and Multidimensional Sleep Health: The SWAN Sleep Study** Annals of Behavioral Medicine. Bowman MA, Kline CE, Buysse DJ, Kravitz HM, Joffe H, Matthews KA, Bromberger JT, Roecklein KA, Krafty RT, Hall MH. Longitudinal Association Between Depressive Symptoms and Multidimensional Sleep Health: The SWAN Sleep Study. Ann Behav Med. 2021 Jun 28;55(7):641-652. doi: 10.1093/abm/kaaa107. PMID: 33410460; PMCID: PMC8240133
Primary Question: Are depressive symptoms (average and change) associated with multiple measures of sleep?
Summary of Findings: Average depressive symptoms, but not change in depressive symptoms, were associated with a multidimensional measure of sleep. Specifically, higher average depressive symptoms were associated with lower levels of sleep satisfaction and alertness, but no measures of sleep assessed with actigraphy (a research-grade Fitbit).
[WG#922]

82 Shieh A, Karlamangla A, Huang M, Han W, Greendale GA. **Faster Lumbar Spine Bone Loss in Midlife Predicts Subsequent Fracture Independent of Starting Bone Mineral Density** J Clin Endocrinol Metab 2021 Jun 16;106(7):e2491-e2501. doi: 10.1210/clinem/dgab279. PMID: 33903908 PMCID: PMC8208668
Primary Question:
Are women who lose bone faster during the menopause transition more likely to fracture?
Summary of Findings: Women who lose bone faster during the menopause transition are more likely to fracture.
[WG#785]

83 Cauley JA, Karlamangla AS, Ruppert K, Lian Y, Huang M, Harlow S, Finkelstein JS, Greendale GA **Race/ethnic difference in trabecular bone score in midlife women: The Study of Women's Health Across the Nation (SWAN)** Arch Osteoporos 2021 Jun 8;16(1):91. doi: 10.1007/s11657-021-00951-4. PMID: 34101033
Primary Question: TBS varies by race/ethnicity.
Summary of Findings: There was no difference in Trabecular Bone Score (TBS) comparing White and Black women after adjusting for body mass index (BMI) and diabetes status. Japanese women had lower TBS than White women. Our results diverge from established differences in fracture rates by race/ethnicity.
[WG#867]

84 Ylitalo KR, Karvonen-Gutierrez CA, Sternfeld B, Pettee Gabriel K. **Association of Physical Activity and Physical Functioning Phenotypes With Fall Risk Among Women.** J Aging Health Ylitalo KR, Karvonen-Gutierrez CA, Sternfeld B, Pettee Gabriel K. Association of Physical Activity and Physical Functioning Phenotypes With Fall Risk Among Women. J Aging Health. 2021 Jun-Jul;33(5-6):409-417. doi: 10.1177/0898264320988405. Epub 2021 Jan 31. PMID: 33517822; PMCID: PMC8356562.
Primary Question: Do physical activity behavior and physical functioning influence fall risk among older adult women?
Summary of Findings: Women with low physical activity and poor physical functioning are more likely to fall compared to women with high physical activity and good physical

functioning. Women who experience declining physical functioning over time are more likely to fall, but women who increase physical activity over time are not more likely to fall. Women can be physically activity to the extend they are able without increasing fall risk, even among those with physical functioning limitations.
[WG#1029]

85 Reeves AN, Elliott MR, Brooks MM, Karvonen-Gutierrez CA, Bondarenko I, Hood MM, Harlow SD. **Symptom clusters predict risk of metabolic-syndrome and diabetes in midlife: the Study of Women's Health Across the Nation** Ann Epidemiol 2021 Jun;58:48-55. doi: 10.1016/j.annepidem.2021.02.011. Epub 2021 Feb 22. PMID: 33631313 PMCID: PMC8165007
Primary Question: Do women with a heavy symptom burden at enrollment have an increased risk of having or developing MetS or Diabetes.
Summary of Findings: This study found that women in mid-life who experienced multiple high to moderate intensity symptoms across a range of physical and mental health domains, not exclusive to menopausal symptoms, were at higher risk for earlier onset of both type 2 diabetes and MetS than women with a lower symptom burden. Specifically, women in latent symptom classes experiencing a broad range of physical and psychological symptoms at moderate to high intensity, as well as women in the latent class characterized by experience of moderate vasomotor, pain, fatigue, sleep and physical health symptoms that interfere with life but fewer psychological symptoms were at highest risk of earlier onset of MetS and type 2 diabetes.
[WG#806MS2]

86 Ding N, Karvonen-Gutierrez CA, Herman WH, Calafat AM, Mukherjee B, Park SK **Associations of perfluoroalkyl and polyfluoroalkyl substances (PFAS) and PFAS mixtures with adipokines in midlife women** Int J Hyg Environ Health Ding N, Karvonen-Gutierrez CA, Herman WH, Calafat AM, Mukherjee B, Park SK. Associations of perfluoroalkyl and polyfluoroalkyl substances (PFAS) and PFAS mixtures with adipokines in midlife women. Int J Hyg Environ Health. 2021 Jun;235:113777. doi: 10.1016/j.ijheh.2021.113777. Epub 2021 Jun 2. PMID: 34090141; PMCID: PMC8207532
Primary Question: Perfluoroalkyl and polyfluoroalkyl substances (PFAS) exposure have been associated with obesity and related comorbidities. However, underlying mechanisms are not well understood. Therefore, we determined if serum PFAS concentrations were associated with adipokine profiles in midlife women.
Summary of Findings: We found that leptin concentrations and free leptin index (the ratio of leptin to soluble leptin receptor) at a 3-year follow-up were significantly higher in women with higher baseline concentrations of various PFAS compounds. In contrast, PFAS concentrations were not associated with soluble leptin receptor, total adiponectin, or high molecular weight adiponectin.
[WG#877MS11]

87 Miller JM, Hood MM, Karvonen-Gutierrez CA, Richards-McCullough KC, Harlow SD **Paper towel test as independently self-administered to quantify cough-related urine loss: Compliance and comparisons with survey-only data in SWAN.** Neurourol Urodyn Miller JM, Hood MM, Karvonen-Gutierrez CA, Richards-McCullough KC, Harlow SD. Paper towel test as independently self-administered to quantify cough-related urine loss: Compliance and comparisons with survey-only data in SWAN. Neurourol Urodyn. 2021 Jun;40(5):1207-1216.

doi: 10.1002/nau.24683. Epub 2021 May 11. PMID: 33973662; PMCID: PMC9255279.
Primary Question: Can the accuracy of incontinence sub-type classification be improved by adding a simple self-administered test, called the paper towel test, designed to catch leakage that results from coughing.
Summary of Findings: We conclude that adding a self-administered paper towel test to an epidemiologic study has high participant acceptance (less than 2% declined), and reduces estimation errors in presence and categorization of incontinence.
[WG#916]

88 Pettee Gabriel K, Karvonen-Gutierrez CA, Colvin AB, Ylitalo KR, Whitaker KM, Lange-Maia BS, Lucas AR, Dugan SA, Derby C, Cauley JA, Sternfeld B **Associations of accelerometer-determined sedentary behavior and physical activity with physical performance outcomes by race/ethnicity in older women** Prev Med Rep Pettee Gabriel K, Karvonen-Gutierrez CA, Colvin AB, Ylitalo KR, Whitaker KM, Lange-Maia BS, Lucas AR, Dugan SA, Derby C, Cauley JA, Sternfeld B. Associations of accelerometer-determined sedentary behavior and physical activity with physical performance outcomes by race/ethnicity in older women. Prev Med Rep. 2021 May 19;23:101408. doi: 10.1016/j.pmedr.2021.101408. PMID: 34123715; PMCID: PMC8173313.
Primary Question: To determine the associations of accelerometer-measured sedentary behavior and physical activity with physical performance and examine differences by race/ethnicity
Summary of Findings: Moderate to vigorous intensity physical activity was consistently related to better physical performance. Replacing 10-minutes of sedentary time for an equal amount of moderate to vigorous intensity physical activity was related to improvements on the stair climb, 40 foot walk test, and short physical performance battery. Important race/ethnic differences in the observed associations were noted for the stair climb.
[WG#924]

89 Ding N, Karvonen-Gutierrez CA, Herman WH, Calafat AM, Mukherjee B, Park SK **Perfluoroalkyl and polyfluoroalkyl substances and body size and composition trajectories in midlife women: the study of women's health across the nation 1999-2018** Int J Obes (Lond) 2021 May 13. doi: 10.1038/s41366-021-00848-9. Online ahead of print. PMID: 33986457
Primary Question: We aimed to examine associations of serum PFAS concentrations with longitudinal changes in weight, waist circumference (WC), fat mass, and proportion fat in midlife women.
Summary of Findings: PFOS, PFOA, EtFOSAA and MeFOSAA serum concentrations during midlife were positively associated with large body size and body fat in midlife women. Higher PFOS, PFHxS, EtFOSAA and MeFOSAA at baseline were also associated with accelerated increases in measures of adiposity over time. PFAS may be an underappreciated contributing factor to women’s obesity risk.
[WG#877MS7]

90 Solomon D, Ruppert K, Habel L, Finkelstein J, Lian P, Joffe H, Kravitz H. **Prescription medications for sleep disturbances among midlife women during 2 years of follow-up: a SWAN retrospective cohort study** BMJ Open 2021 May 11;11(5):e045074. doi: 10.1136/bmjopen-2020-045074. PMID: 33975865 PMCID: PMC8127972
Primary Question: Is the long-term use of sleep medications associated with improvement

in sleep disturbances?

Summary of Findings: Women who started medications for sleep disturbances had not significant improvement over baseline sleep symptoms and did no better than similar women who did not start sleep medications.

These analyses are limited by their observational nature, but suggest that women who initiated sleep medications rated their sleep disturbances similar after one and two years. The potential benefits of long-term use of sleep medication should be re-examined.

[WG#968MS2]

91 McConnell DS, Crawford SL, Gee NA, Bromberger JT, Kazlauskaite R, Avis NE, Crandall CJ, Joffe H, Kravitz HM, Derby CA, Gold EB, El Khoudary SR, Harlow S, Greendale GA, Lasley BL **Lowered progesterone metabolite excretion and an oscillatory LH excretion pattern associates with VMS but not negative mood in the early perimenopausal transition: Study of Women's Health Across the Nation** Maturitas 2021 May;147:26-33. doi: 10.1016/j.maturitas.2021.03.003. Epub 2021 Mar 5. PMID: 33832644 PMCID: PMC8091174
Primary Question: What hormone changes are associated with negative mood and/or VMS?
Summary of Findings: Lower PdG excretion and a specific pattern of LH excretion associates with VMS but not negative mood. An oscillatory pattern of LH associating with VMS is consistent with episodic pituitary fatigue leading to increased kisspeptin secretion. These results suggest that nncreased kisspeptin may be the final step in altering vasomotor tone.
[WG#903]

92 Wang X, Karvonen-Gutierrez CA, Mukherjee B, Herman WH, Park SK. **Urinary Metals and Adipokines in Midlife Women: Study of Women's Health Across the Nation (SWAN)** Environ Res 2021 May;196:110426. doi: 10.1016/j.envres.2020.110426. Epub 2020 Nov 4. PMID: 33157106 PMCID: PMC8093324
Primary Question: Epidemiologic studies on associations between metals and adipokines have been limited and results are mixed. We examined the associations of 15 urinary metal concentrations with prospectively-assessed serum levels of adipokines including HMW adiponectin, leptin, and soluble leptin receptor (sOB-R).
Summary of Findings: In multivariable adjusted adaptive elastic-net models, urinary molybdenum was associated with a 5.54% higher level (95% CI: 1.36%, 9.90%), whereas cadmium was associated with a 4.53% lower level (95% CI: -8.17%, -0.76%) of HMW-adiponectin. Urinary molybdenum was also associated with a 5.95% lower leptin level (95% CI: -10.15%, -1.56%) and a 2.98% (95% CI: 0.69%, 5.32%) higher sOB-R level. Urinary cesium and lead were associated with a 3.58% (95% CI: -6.06%, -1.03%) and a 2.53% (95% CI: -4.80%, -0.21%) lower level of sOB-R, respectively.
[WG#877MS8]

93 Zhao W, Smith JA, Yu M, Crandall CJ, Thurston RC, Hood MM, Ruiz-Narvaez E, Peyser PA, Kardia SLR, Harlow SD **Genetic variants predictive of reproductive aging are associated with vasomotor symptoms in a multiracial/ethnic cohort**

Menopause Zhao W, Smith JA, Yu M, Crandall CJ, Thurston RC, Hood MM, Ruiz-Narvaez E, Peyser PA, Kardia SLR, Harlow SD. Genetic variants predictive of reproductive aging are associated with vasomotor symptoms in a multiracial/ethnic cohort. Menopause. 2021 Apr 26;28(8):883-892. doi: 10.1097/GME.0000000000001785. PMID: 33906203; PMCID: PMC8373653
Primary Question: Vasomotor symptoms (VMS), hot flashes and night sweats, are cardinal symptoms of the menopausal transition. Little is known about genetic influences on VMS.
Summary of Findings: The C-allele of rs74827081 in TACR3 was associated with reduced likelihood of frequent VMS in White women. Higher age at menarche PRS (later menarche), was negatively associated with frequent VMS in Black women but positively associated with frequent VMS in Chinese women. With higher PRS for age at menarche, Black women were also less likely to have a persistently high vs persistently low VMS trajectory while White women were less likely to have an FMP onset trajectory (vs. persistently low). Chinese women with higher menopause PRS were more likely to have frequent VMS.
[WG#994MS2]

94 Zhao W, Smith J, Bielack L, Ruiz-Narvaez E, Yu M, Hood M, Peyser P, Kardia S, Harlow S. **Associations between polygenic risk score for age at menarche and menopause, reproductive timing, and serum hormone levels in multiple race/ethnic groups.** Menopause 2021 Apr 19;28(7):819-828. doi: 10.1097/GME.0000000000001775. PMID: 33878091; PMCID: PMC8225555.
Primary Question: Do the genetic loci that contribute to age at menarche and at menopause also play a role in related sentinel menopausal traits such as duration of the menopausal transition or hormone levels before or after the menopause?
Summary of Findings: Polygenic risk scores associated with onset (menarche) and ending (menopause) of reproductive life are determinants of menopausal timing and hormone levels in multiple ethnic groups
[WG#994]

95 Lewis TT, Van Dyke ME, Matthews KA, Barinas-Mitchell E **Race/Ethnicity, Cumulative Midlife Loss, and Carotid Atherosclerosis in Middle-Aged Women** Am J Epidemiol 2021 Apr 6;190(4):576-587. doi: 10.1093/aje/kwaa213. PMID: 33034337 PMCID: PMC8024052
Primary Question: Are African-American women more likely than women from other racial/ethnic backgrounds to experience multiple deaths of friends and/or family members over the course of midlife? Do these deaths have an impact on carotid atherosclerosis that is stronger for African-American women compared to women from other racial/ethnic groups?
Summary of Findings: Consistent with prior research, we found a racial/ethnic disadvantage in the experience of loss—with African-American women much more likely to report three or more upsetting deaths of friends and family members throughout midlife than White, Chinese or Hispanic women. These losses were associated with greater atherosclerosis in the carotid artery for African-American women, but not White, Chinese, or Hispanic women. Our findings in African-American women were not explained by cardiovascular risk factors, including BMI, blood pressure, cholesterol, smoking, or depressive symptoms
[WG#837]

96 Everson-Rose SA, Barinas-Mitchell EJ, El Khoudary SR, Huang H, Wang Q, Janssen I,

Thurston R, Jackson E, Lewis M, Karvonen-Gutierrez C, Mancuso P, Derby C. **Adipokines and Subclinical Cardiovascular Disease in Women at Midlife: Study of Women's Health Across the Nation** Journal of the American Heart Association 2021 Mar 27;e019173. doi: 10.1161/JAHA.120.019173. PMID: 33779242 PMCID: PMC8174324
Primary Question: Are adiponectin and leptin, markers of inflammation derived from fat cells, associated with subclinical cardiovascular disease in women at mid-life?
Summary of Findings: Adiponectin, an anti-inflammatory protein, was inversely related to higher levels of atherosclerosis and greater arterial stiffness. Analyses showed that traditional risk factors for heart disease largely accounted for these relationships. Leptin, a pro-inflammatory protein, also was associated with more atherosclerosis in the carotid arteries and these associations remained after taking into account other heart disease risk factors. This study indicates that adiponectin and leptin are important markers of inflammation that are related to risk for heart disease in women.
[WG#798]

97 Badon SE, Gabriel KP, Karvonen-Gutierrez C, Sternfeld B, Gold EB, Waetjen LE, Lee C, Avalos LA, El Khoudary SR, Hedderson MM **Dual trajectories of physical activity and blood lipids in midlife women: The Study of Women's Health Across the Nation** Maturitas 2021 Apr;146:49-56. doi: 10.1016/j.maturitas.2021.02.002. Epub 2021 Feb 6. PMID: 33722364 PMCID: PMC7966732
Primary Question: What are the patterns of physical activity and blood lipids across midlife in women? Are physical activity patterns associated with blood lipid patterns across midlife in women?
Summary of Findings: The most frequently observed patterns were consistently low physical activity, low or moderate HDL cholesterol, moderately low LDL cholesterol, and consistently low triglycerides. We did not find associations of long-term physical activity patterns with blood lipid patterns across midlife.
[WG#912]

98 Kroenke C, Alexeeff S, Kushi L, Kwan M, Matthews K. **Clustering of Social and Physical Pain Variables and Their Association With Mortality in Two Population-Based Cohorts** Psychosom Med 2021 Apr 1;83(3):228-238. doi: 10.1097/PSY.0000000000000910. PMID: 33793454 PMCID: PMC8023720
Primary Question: Social isolation and physical pain are related bidirectionally and as a function of temperament, the social environment, and disease processes, but whether and how these variables cluster in the population are unknown.
Summary of Findings: In two cohorts of women, regardless of age and disease status, latent class analysis produced similar sets of social-pain clusters with the same proportion in each cohort having both high social and pain symptomatology; women in this cluster also had elevated mortality.
[WG#940]

99 Greendale GA, Jackson NJ, Han W, Huang M, Cauley JA, Karvonen-Gutierrez C, Karlamangla AS **Increase in C-Reactive Protein Predicts Increase in Rate of Bone Mineral Density Loss: the Study of Women's Health Across the Nation (SWAN)** JBMR Plus. 2021 Mar 16;5(4):e10480. doi: 10.1002/jbm4.10480. PMID: 33869996; PMCID: PMC8046126.
Primary Question: Does increased level of CRP put women at greater risk of bone loss?

Summary of Findings: Within-woman increases in CRP levels predicted increases in the rates of bone loss in the next ~2 years and this association varied by the MT stage

Each within-woman doubling of CRP was associated with a 0.09% faster yearly decline in femoral neck BMD in MT stages 1 (premenopause and early perimenopause) and 3 (late postmenopause), and 0.10% faster decline in lumbar spine BMD in MT stage 3 only.

[WG#1006]

100 Derby CA, Hutchins F, Greendale GA, Matthews KA, Sternfeld B, Everson-Rose SA, Kazlauskaite R, Whitmer RA, Brooks MM **Cardiovascular risk and midlife cognitive decline in the Study of Women's Health Across the Nation.** Alzheimers Dement 2021 Mar 12. doi: 10.1002/alz.12300. Online ahead of print. PMID: 33710770
Primary Question: Does presence of cardiovascular risk factors in midlife predict the rate of cognitive decline over midlife?
Summary of Findings: We showed that during midlife, women experiences declines in processing speed, working memory and delayed recall. Presence of diabetes, elevated fasting glucose, central obesity as well as a composite index of cardiovascular risk at study baseline were each associated with the midlife rate of change in processing speed. Results suggest that control of cardiovascular risk factors in midlife may prevent cognitive decline in midlife women.
[WG#547]

101 Kline CE, Colvin AB, Pettee Gabriel K, Karvonen-Gutierrez CA, Cauley JA, Hall MH, Matthews KA, Ruppert KM, Neal-Perry GS, Strotmeyer ES, Sternfeld B **Associations between longitudinal trajectories of insomnia symptoms and sleep duration with objective physical function in postmenopausal women: the Study of Women's Health Across the Nation** Sleep 2021 Mar 11;zsab059. doi: 10.1093/sleep/zsab059. Online ahead of print. PMID: 33705558
Primary Question: Our main research question was whether the patterns of sleep complaints and sleep duration over a 13-year period would be associated with objective physical function at the end of that 13-year period.
Summary of Findings: We found that a consistent pattern of sleep complaints and persistent insufficient sleep duration during midlife were each associated with slower gait speed and, counterintuitively, a lower likelihood of balance problems.
[WG#834]

102 Hutchins F, Krafty R, El Khoudary SR, Catov J, Colvin A, Barinas-Mitchell E, Brooks MM **Gestational weight gain and long-term maternal obesity risk: A multiple bias analysis** Epidemiology 2021 Mar 1;32(2):248-258. doi: 10.1097/EDE.0000000000001310. PMID: 33284167 PMCID: PMC7855686
Primary Question: Is the association between excessive pregnancy weight gain and maternal midlife obesity that we have observed in SWAN due to systematic error (statistical bias) in the data collection methods?
Summary of Findings: A history of excessive weight gain during pregnancy is associated with an increased risk of maternal midlife obesity, after accounting for bias due to participant drop-out and the use of self-report to measure pregnancy weight.
[WG#961]

103 Samargandy S, Matthews KA, Brooks MM, Barinas-Mitchell E, Magnani JW, Janssen I, Kazlauskaite R, El Khoudary S. **Abdominal visceral adipose tissue over the menopause transition and carotid atherosclerosis: the SWAN heart study** Menopause 2021 Mar 1;28(6):626-633. doi: 10.1097/GME.0000000000001755. PMID: 33651741 PMCID: PMC8141004.
Primary Question:
Question 1a: Does VAT increase around the FMP, suggesting a contribution of the menopausal transition?
Question 1b: Do Black women have greater adverse VAT changes around the FMP compared with White women?
Question 2: Do menopause-related changes in VAT increase CAROTID ARTERY ATHEROSCLEROSIS?
Summary of Findings: Women experience accelerated increase in VAT starting 2 years before the FMP, consistent with a menopause-related effect. This menopause-related increase in VAT is associated with greater risk of carotid atherosclerosis.
[WG#941]

104 Avis NE, Colvin A, Hess R, Bromberger JT **Midlife Factors Related to Psychological Well-Being at an Older Age: Study of Women's Health Across the Nation (SWAN)** J Womens Health (Larchmt) 2021 Mar;30(3):332-340. doi: 10.1089/jwh.2020.8479. Epub 2020 Oct 22. PMID: 33090934 PMCID: PMC7957375
Primary Question: How do personal and social resources and modifiable behaviors at midlife relate to women's psychological well-being (PWB) at later life, and does psychological resilience moderate the impact of health problems on PWB?
Summary of Findings: Several modifiable factors at midlife were associated with better PWB in older women: greater physical activity, fewer sleep problems, and less perceived stress. Psychological resilience may moderate the impact of sleep problems.
[WG#933]

105 Greendale GA, Han W, Huang M, Upchurch DM, Karvonen-Gutierrez C, Avis NE, Karlamangla AS. **Longitudinal Assessment of Physical Activity and Cognitive Outcomes Among Women at Midlife** JAMA Netw Open 2021 Mar 1;4(3):e213227. doi: 10.1001/jamanetworkopen.2021.3227. PMID: 33787912. PMC8013795
Primary Question: Do higher amounts of physical activity during middle age slow cognitive aging?
Summary of Findings: We did not find evidence that greater physical activity was related to either better cognitive scores at the beginning of the study, when women were in their 50's, or less cognitive decline during up to 13 years of follow up.
[WG#951MS]

106 Yi Y, El Khoudary SR, Buchanich JM, Miller RG, Rubinstein D, Matthews K, Orchard TJ, Costacou T **Women with Type 1 diabetes (T1D) experience a shorter reproductive period compared with nondiabetic women: the Pittsburgh Epidemiology of Diabetes Complications (EDC) study and the Study of Women's Health Across the Nation (SWAN).** Menopause 2021 Mar 1;28(6):634-641. doi: 10.1097/GME.0000000000001758. PMID: 33651743
Primary Question: Whether the length of reproductive period, age at menarche, and age at

natural menopause differ in women with type 1 diabetes, compared to women without diabetes.
Summary of Findings: Women with type 1 diabetes onset before menarche have a shorter reproductive period compared with non-diabetic women, exhibiting delayed menarche and earlier natural menopause.
[WG#1015]

107 Swanson L, Hood M, Hall M, Kravitz H, Matthews K, Joffe H, Thurston R, Butters M, Ruppert K, Harlow S **Associations between Sleep and Cognitive Performance in a Racially/Ethnically Diverse Cohort: The Study of Women's Health Across the Nation (SWAN)** Sleep 2021 Feb 12;44(2):zsaa182. doi: 10.1093/sleep/zsaa182. PMID: 32918472 PMCID: PMC7879413.
Primary Question: To determine whether total sleep time, wake after sleep onset, and sleep fragmentation are associated with cognitive performance, and whether the associations vary by race/ethnicity.
Summary of Findings: Wakefulness and physical restlessness during the sleep period are associated with impairment in processing speed among older women. However, when race/ethnicity was examined as a moderator of sleep-cognitive performance, relative to white women, black women had less cognitive resiliency to worse sleep. Sleep-cognitive performance associations in Chinese and Japanese women were not different from white women.
[WG#934]

108 Cortés YI, Brooks M, Barinas-Mitchell E, Matthews KA, Thurston RC, Catov JM **Impact of prior preterm or term small for gestational age birth on maternal blood pressure during the menopause transition in the Study of Women's Health Across the Nation** Menopause 2021 Feb 8;28(3):255-262. doi: 10.1097/GME.0000000000001739. PMID: 33570873
Primary Question: Does blood pressure accelerate more rapidly during the menopause transtion for women with a history of a preterm birth or term small for gestational age birth compared to women with all term and appropriate for gestational age births?
Summary of Findings: This study suggests that women with a history preterm and term SGA delivery have higher BP than women with all term AGA births during the menopause transition, but that rate of change in BP does not differ in these group relative to final menstrual period. Our results highlight that earlier interventions prior to menopause may be necessary among women with a preterm or term SGA delivery to prevent elevated BP in midlife and future CVD.
[WG#836]

109 Thurston RC, Aslanidou Vlachos HE, Derby CA, Jackson EA, Brooks MM, Matthews KA, Harlow S, Joffe H, El Khoudary SR **Menopausal vasomotor symptoms and risk of incident cardiovascular disease events in the Study of Women's Health the Nation** JAHA 2021 Feb 2;10(3):e017416. doi: 10.1161/JAHA.120.017416. Epub 2021 Jan 20. PMID: 33470142 PMCID: PMC7955448
Primary Question: Are menopausal vasomotor symptoms (VMS) associated with risk of incident cardiovascular disease (CVD) events?
Summary of Findings: Women with frequent VMS at baseline or persistently frequent VMS over the course of the study have increased risk for incident CVD / CVD mortality. Findings

persisted controlling for covariates.
[WG#776]

110 Chung HF, Zhu D, Dobson AJ, Kuh D, Gold EB, Crawford SL, Avis NE, Mitchell ES, Woods NF, Anderson DJ, Mishra GD **Age at menarche and risk of vasomotor menopausal symptoms in midlife: a pooled analysis of six studies** BJOG 2021 Feb;128(3):603-613. doi: 10.1111/1471-0528.16393. Epub 2020 Jul 21. PMID: 33135854 PMCID: PMC7855657
Primary Question:
Summary of Findings:
[WG#1007PUD]

111 El Khoudary SR, Chen X, Nasr AN, Billheimer J, Brooks MM, McConnell D, Orchard TJ, Crawford SL, Matthews KA, Rader DJ **HDL (High-Density Lipoprotein) Subclasses, Lipid Content, and Function Trajectories Across the Menopause Transition: SWAN-HDL Study** Arterioscler Thromb Vasc Biol 2021 Feb;41(2):951-961. doi: 10.1161/ATVBAHA.120.315355. Epub 2020 Dec 3. Erratum in: Arterioscler Thromb Vasc Biol. 2021 May 5;41(5):e283. PMID: 33267661; PMCID: PMC8105263.
Primary Question: Does HDL-C increase reflect a cardio-protective profile of HDL composition and function in women traverse menopause?
Summary of Findings: Although HDL-C increased over the MT, measures of HDL composition showed a dramatic adverse changes. While HDL-CEC seemed to increase, HDL-CEC per particle declined. Large HDL-P may be compromised and became less efficient in promoting HDL-CEC during the MT
[WG#988]

112 Wang X, Ding N, Harlow SD, Randolph JF Jr, Mukherjee B, Gold EB, Park SK **Urinary metals and metal mixtures and timing of natural menopause in midlife women: The Study of Women's Health Across the Nation.**
Primary Question: Limited data have reported the possible effects of various metals on the timing of natural menopause. In this study, we examined if women with higher urinary concentrations of metals and metal mixtures experienced natural menopause earlier using data from a prospective cohort of midlife women, the Study of Women's Health Across the Nation, from 1999 to 2018.
Summary of Findings: We found that women with higher urinary concentrations of arsenic, mercury, and lead reached natural menopause earlier. Women whose combined exposure to metals above the top 25 percentile had a 69% higher risk of reaching natural menopause than women in the bottom 25 percentile, which is equivalent to a 1 year earlier median time to natural menopause.
[WG#877MS12]

113 Matthews KA, Chen X, Barinas-Mitchell E, Brooks MM, Derby CA, Harlow S, Jackson EA, Thurston RC, El Khoudary SR **Age at Menopause in Relationship to Lipid Changes and Subclinical Carotid Disease Across 20 Years: Study of Women's Health Across the Nation**
Primary Question: (1) Do women who are older at FMP have less adverse lipid changes around the FMP and thereafter into the postmenopausal years? (2) Do the hypothesized less adverse changes associated with older age at FMP predict less carotid plaque, intima-media thickness, and adventitial diameter measures later in life?

Summary of Findings: Despite the epidemiological literature showing early age at FMP is associated with elevated risk for CVD events and all-cause mortality, we found that later age of FMP had inconsistent associations with lipid changes in mid-life and that the observed changes did not translate into less risk for subclinical carotid disease and in some cases more risk.
[WG#949]

114 Lee S, Karvonen-Gutierrez C, Mukherjee B, Herman WH, Harlow SD, Park SK. **Urinary concentrations of phenols and parabens and incident diabetes in midlife women: The Study of Women's Health Across the Nation**
Primary Question: Although environmental exposure to personal care and product chemicals may play a role in the pathogenesis of diabetes, only a few phenols, most notably bisphenol A, have been studied with limited data. We examined associations between personal care and consumer product chemicals, assessed in urine at two time-points, and incident diabetes in the Study of Women's Health Across the Nation (SWAN), a multi-ethnic prospective cohort of midlife women.
Summary of Findings: We observed consistent inverse associations between parabens and incident diabetes at the Multi-pollutant study (MPS) baseline (1999-2000) and three-year later (2002-2003). Triclocarban with the 3-year exposure later baseline, dichotomized (yes/no) due to low detection rates (<15%), was positively associated with incident diabetes. Positive associations were found for 2,4-dichlorophenol only with the MPS baseline and for bisphenol-A only with the 3-year exposure later baseline. No significant associations were observed for the overall joint effect of phenol and paraben mixture at either time-points.
[WG#877MS9]

115 Swabe G, Matthews KA, Brooks MM, Janssen I, Wang N, El Khoudary S. **High-density lipoprotein cholesterol and arterial calcification in midlife women: the contribution of estradiol and C-reactive protein** Menopause 2020 Dec 21;28(3):237-246. doi: 10.1097/GME.0000000000001706. PMID: 33350671 PMCID: PMC7887095.
Primary Question: Does HDL offer less of a protective effect with respect to atherosclerosis in women with lower levels of estradiol compared to women with higher levels? Does increased inflammation explain this difference?
Summary of Findings: SWAN Heart Cohort

The protective cardiovascular association of higher HDL-C levels on AC was modified by estradiol but not CRP concentrations, suggesting a concentration of estradiol level to this association. The pathways through which estradiol might impact this association should be investigated in future studies
[WG#945]

116 Karvonen-Gutierrez CA, Hood MM, Moroi S, Musch DC, Kumar N, Wood SD **Disparities in Vision Impairment and Eye Diseases among Early Late-Life Women: The Study of Women's Health Across the Nation, Michigan Site** Innov Aging Karvonen-Gutierrez C, Kumar N, Moroi S, Musch D, Wood SD, Ehrlich J, Hood M. Vision Impairment Among Late Mid-Life Women: Michigan Study of Women's Health Across the Nation. Innov Aging. 2020 Dec 16;4(Suppl 1):811–2. doi: 10.1093/geroni/igaa057.2951. PMCID: PMC7741658.
Primary Question: What is the prevalence of vision impairment and age-related eye diseases among older women and does it differ by important sociodemographic variables?

Summary of Findings: Although nearly one in 10 Michigan SWAN women were defined as having vision impairment (worse than 20/40 in their better seeing eye) when using their usual correction, the vast majority (75%) of this was able to be corrected. Although there were important disparities in presenting vision impairment by race/ethnicity, economic strain and education, these differences did not persist after optimal correction. Further, despite high burden of ocular conditions, ranging from 3.3% for age-related macular degeneration to 30.2% for hypertensive retinopathy, more than half of women with a given condition were unaware of their diagnosis.
[WG#967]

117 Stewart AL, Magnani JW, Barinas-Mitchell E, Matthews KA, El Khoudary SR, Jackson EA, Brooks MM. **Social Role Stress, Reward and the American Heart Association Life's Simple 7 in Midlife Women: The Study of Women's Health Across the Nation** J Am Heart Assoc 2020 Dec 15;9(24):e017489. doi: 10.1161/JAHA.120.017489. Epub 2020 Dec 11. PMID: 33302752 PMCID: PMC7955397
Primary Question:
Summary of Findings: We tried multiple ways of summarizing the social role experience of women over mid-life. Women who had a social role that was "extremely" or "quite a bit" stressful during mid-life had worse carotid intima-media thickness than women who never reported a stressful social role. Rewarding social roles were not related to better cardiovascular disease health.
[WG#850A]

118 Solomon DH, Ruppert K, Kazlauskaite R, Lian P, Kravitz HM. **Sleep medications and sleep disturbances across middle aged pre- or peri-menopausal women of different race and ethnicities: A SWAN pharmacoepidemiology cohort study.** Pharmacoepidemiol Drug Saf 2020 Dec;29(12):1715-1721. doi: 10.1002/pds.5102. Epub 2020 Aug 18. PMID: 32810917
Primary Question: How does the use of medications impact sleep?
Summary of Findings:
[WG#968]

119 Bowman MA, Brindle RC, Joffe H, Kline CE, Buysse DJ, Appelhans BM, Kravitz HM, Matthews KA, Neal-Perry GS, Krafty RT, Hall MH **Multidimensional sleep health is not cross-sectionally or longitudinally associated with adiposity in the Study of Women's Health Across the Nation (SWAN)** Sleep Health 2020 Dec;6(6):790-796. doi: 10.1016/j.sleh.2020.04.014. Epub 2020 Jul 15. PMID: 32680819
Primary Question: Is multidimensional sleep health longitudinally associated with body mass index and waist-to-hip ratio?
Summary of Findings: There were no substantial changes in body mass index or waist-to-hip ratio from the sleep study to the follow-up assessment. Better sleep health was not longitudinally associated with body mass index or waist-to-hip ratio after accounting for adiposity at the sleep study.
[WG#923]

120 Jackson EA, Ruppert K, Derby CA, Lian Y, Chae CU, Kazlauskaite R, Neal-Perry G, El Khoudary SR, Harlow SD, Solomon DH **Is race and ethnicity are associated with under-utilization of Statins among Women in the United States: The Study of Women's Health**

Across the Nation (SWAN) Clin Cardiol 2020 Dec;43(12):1388-1397. doi: 10.1002/clc.23448. Epub 2020 Aug 30. PMID: 32862481 PMCID: PMC7724205
Primary Question: Is race/ethnicity associated with self-reported receipt of statins among women eligible for statin therapy
Summary of Findings: Women who would benefit from statins (i.e., those with a diagnosis of cardiovascular disease [CVD], diabetes, very high low-density lipoprotein cholesterol (LDL-c) and an elevated risk for CVD events had suboptimal rates of statin us. Less than half of women CVD reported using statins. Black women had lower rates of statin use compared to white participants.
[WG#794]

121 Cortes Y, Conant R, Catov J, Matthews KA, Crawford S, Hedderson M, Thurston R. **Impact of Nulliparity, Hypertensive Disorders of Pregnancy, and Gestational Diabetes on Vasomotor Symptoms in Midlife Women** Menopause 2020 Dec;27(12):1363-1370. doi: 10.1097/GME.0000000000001628. PMID: 32796290 PMCID: PMC8208832
Primary Question: Do women with a history of nulliparity, hypertensive disorders of pregnancy [HDP], or gestational diabetes mellitus [GDM]) have a higher odds of reporting vasomotor symptoms (VMS) at midlife?
Summary of Findings: Compared to women with no HDP/GDM, women with HDP/GDM had a greater odds of reporting any hot flashes, and nulliparous women had a lower odds of any hot flashes. Similar patterns were observed for frequency of hot flashes, but not independently of socio-demographic factors. Our findings underscore the importance of social and economic disparities in both reproductive outcomes and VMS.
[WG#879]

122 Zhu D, Chung HF, Dobson AJ, Pandeya N, Anderson DJ, Kuh D, Hardy R, Brunner EJ, Avis NE, Gold EB, El Khoudary SR, Crawford SL, Mishra GD **Vasomotor Menopausal Symptoms and Risk of Cardiovascular Disease: A pooled analysis of six prospective studies** Am J Obstet Gynecol 2020 Dec;223(6):898.e1-898.e16. doi: 10.1016/j.ajog.2020.06.039. Epub 2020 Jun 23. PMID: 32585222 PMCID: PMC7704910
Primary Question:
Summary of Findings:
[WG#1016PUD]

123 Wang X, Mukherjee B, Karvonen-Gutierrez CA, Herman WH, Batterman S, Harlow SD, Park SK. **Urinary Metal Mixtures and Longitudinal Changes in Glucose Homeostasis: The Study of Women's Health Across the Nation (SWAN)** Environ Int 2020 Dec;145:106109. doi: 10.1016/j.envint.2020.106109. Epub 2020 Sep 12. PMID: 32927284 PMCID: PMC7577932
Primary Question: Epidemiologic studies on associations between metals and insulin resistance and ß-cell dysfunction have been cross-sectional and focused on individual metals. We assessed the association between exposure to metal mixtures, based on assessment of 15 urinary metals, and longitudinal changes in homeostatic model assessments for insulin resistance (HOMA-IR) and ß-cell function (HOMA-ß).

Summary of Findings: In multivariable adjusted adaptive elastic-net models, urinary copper, lead, and zinc were associated with higher HOMA-IR at baseline, whereas molybdenum was associated with lower HOMA-IR at baseline. The estimated changes in

baseline HOMA-IR for one standard deviation increase in log-transformed urinary metal concentrations were 1.57% (-1.09%, 4.29%) for copper, 0.70% (-1.59%, 3.05%) for lead, 5.76% (3.05%, 8.55%) for zinc, and -3.25% (-5.45%, -1.00%) for molybdenum, respectively. Urinary zinc was also positively associated with a faster rate of increase in HOMA-IR. Urinary arsenic and zinc were associated with lower baseline HOMA- ß, whereas cobalt was associated with higher baseline HOMA-ß. Arsenic was also associated with a faster rate of decline in HOMA-ß.

[WG#877MS6]

124 Mishra SR, Chung HF, Waller M, Dobson AJ, Greenwood DC, Cade JE, Giles GG, Bruinsma F, Simonsen MK, Hardy R, Kuh D, Gold EB, Crawford SL, Derby CA, Matthews KA, Demakakos P, Lee JS, Mizunuma H, Hayashi K, Sievert LL, Brown DE, Sandin S, Weiderpass E, Mishra GD **The association Between Reproductive Life Span and Incident Nonfatal Cardiovascular Disease: A Pooled Analysis of Individual Patient Data From 12 Studies** JAMA Cardiol. 2020 Dec 1;5(12):1410-1418. doi: 10.1001/jamacardio.2020.4105. PMID: 32936210 PMCID: PMC7495334
Primary Question:
Summary of Findings:
[WG#1013PUD]

125 Solomon DH, Ruppert K, Kazlauskaite R, Lian P, Kravitz HM **Sleep medications and sleep disturbances across middle aged pre- or peri-menopausal women of different race and ethnicities: A SWAN pharmacoepidemiology cohort study** Pharmacoepidemiol Drug Saf 2020 Dec;29(12):1715-1721. doi: 10.1002/pds.5102. Epub 2020 Aug 18. PMID: 32810917 PMCID: PMC10561994
Primary Question:
Summary of Findings: We noted important baseline differences in women who did and did not report future sleep disturbances or use of medications for sleep. These include differences in anxiety and pain scores, as well as comorbid conditions. These baseline population differences have been reported in prior studies, but herein we report novel longitudinal data. There was a 3-4 fold rise in medication use for sleep over follow-up; this was observed in all race and ethnicities.

Women who did and did not report sleep disturbances were similar in age, BMI, and socioeconomic backgrounds at baseline (Table 1). However, women reporting sleep disturbances were more likely to have higher anxiety and pain scores and more comorbid conditions. Baseline characteristics were quite similar among women who did and did not use sleep medications during follow-up.

Figure 1a illustrates the 20-year time trends in sleep medication use for women who did and did not report sleep disturbances. In 1997, even among those women who reported sleep disturbances during follow-up, only 2.5% reported use of any sleep medication. This percentage increased to 8% over 20 years. However, the proportion of women reporting sleep medication use who did not report a sleep disturbance remained low, approximately 1-2% over the entire follow-up.

Finally, we examined the rates of medication use among women who reported a sleep

disturbance by race and ethnicity (Figure 1b). There were increases across all races/ethnicities. However, there were substantial racial/ethnic differences in the proportion of women using these medications.

[WG#968MS1]

126 France M, Ma B, Gajer P, Brown S, Humphrys MS, Holm J, Waetjen E, Brotman R, Ravel J. **VALENCIA: A nearest centroid classification method for vaginal microbial communities based on composition** Microbiome 2020 Nov 23;8(1):166. doi: 10.1186/s40168-020-00934-6. PMID: 33228810 PMCID: PMC7684964
Primary Question: Can VALENCIA (VAginaL community state typE Nearest CentroId clAssifier), a tool developed to classify vaginal samples into community state types (CSTs) developed from over 13,000 reference vaginal samples from mostly reproductive age women in the U.S. be used for assignment of samples to CSTs from other data sets, including postmenopausal women and women from other regions of the world?

Summary of Findings: VALENCIA provides a much-needed solution for the robust and reproducible assignment of vaginal CSTs, including for postmenopausal women. This will allow unbiased analysis of both small and large vaginal microbiota datasets, comparisons between datasets and meta-analyses that combine multiple datasets.

[WG#977MS2]

127 Davis E, Malig B, Broadwin R, Ebisu K, Basu R, Gold EB, Qi L, Derby CA, Park SK, Wu XM **Association between Coarse Particulate Matter and Inflammatory and Hemostatic Markers in a Cohort of Midlife Women** Environ Health 2020 Nov 5;19(1):111. doi: 10.1186/s12940-020-00663-1. PMID: 33153486. PMCID: PMC7643259
Primary Question: How does exposure to coarse particles influence midlife women's inflammation and coagulation markers?
Summary of Findings: Long-term exposures to coarse particles may increase the risks of thrombosis. This effect was independent from exposures to PM2.5 and other ambient gaseous pollutants.
[WG#935_MS]

128 Greendale GA, Huang M, Cauley J, Harlow S, Finkelstein J, Karlamangla A. **Premenopausal and Early Postmenopausal Trabecular Bone Score (TBS) and Fracture Risk: Study Of Women's Health Across the Nation (SWAN)** Bone 2020 Nov;140:115543. doi: 10.1016/j.bone.2020.115543. Epub 2020 Jul 27. PMID: 32730933 PMCID: PMC7526344
Primary Question: Does baseline or early postmenopausal trabecular bone score (TBS) predict fracture?
Summary of Findings: Our results indicate that variation in premenopausal TBS, a plausible estimate of peak TBS, is related to fracture risk, but this association is not independent of BMD. Our data suggest that the in early postmenopause, the risk of fracture associated with TBS is of a similar magnitude to that observed in premenopause, but our power to detect an association in this group is insufficient to warrant a conclusion.
[WG#862]

129 Sternfeld B, Colvin A, Stewart A, Appelhans BM, Cauley JA, Dugan SA, El Khoudary SR, Greendale GA, Strotmeyer E, Karvonen-Gutierrez C. **Understanding Racial/Ethnic Disparities in Physical Performance in Mid-Life Women: Findings from SWAN (Study of Women's Health Across the Nation)** J Gerontol B Psychol Sci Soc Sci. 2020 Oct 16;75(9):1961-1971. doi: 10.1093/geronb/gbz103. PMID: 31412129 PMCID: PMC7566973
Primary Question: How much of the impact of race/ethnicity on physical performance is due to differences in financial strain, body size, health conditions, physical activity and perceived stress?
Summary of Findings: This study of racial/ethnic differences in physical performance confirmed that disparities in physical function experienced by older African American and Hispanic women are apparent in mid-life, and that midlife Chinese women also suffer a disparity in physical performance, while Japanese women do not. Some, Almost all of the racial/ethnic disparities in physical performance in African Americans and Hispanics can be explained by known socioeconomic, medical, behavioral, or psychosocial factors, but these factors do not account for the disparity in the Chinese.
[WG#767]

130 Matthews KA, Chang Y, Brooks MM, Crawford SL, Janssen I, Joffe H, Kravitz HM, Thurston RC, El Khoudary SR. **Identifying women who share patterns of reproductive hormones, vasomotor symptoms, and sleep maintenance problems across the menopause transition: group-based multi-trajectory modeling in the Study of Women's Health Across the Nation** Menopause Matthews KA, Chang Y, Brooks MM, Crawford SL, Janssen I, Joffe H, Kravitz HM, Thurston RC, El Khoudary SR. Identifying women who share patterns of reproductive hormones, vasomotor symptoms, and sleep maintenance problems across the menopause transition: group-based multi-trajectory modeling in the Study of Women's Health Across the Nation. Menopause. 2020 Oct 5;28(2):126-134. doi: 10.1097/GME.0000000000001663. PMID: 33038144; PMCID: PMC9238015.
Primary Question: Can women be grouped into distinct groups based on combinations of trajectories of FSH, frequent VMS, and sleep maintenance problems during the menopausal transition? Do race/ethnicity, body mass index, and depressive symptoms predict group membership?
Summary of Findings: Women can be classified into five distinct groups based on shared patterns of FSH, frequent VMS, and sleep maintenance problems based on trajectories 10 years before and after final menstrual period. Either VMS or sleep maintenance problems can be dominant in the face of high FSH. Race/ethnicity, body mass index, and depressive symptoms at baseline and change in depressive symptoms during the early phase of the transition predict group membership.
[WG#976]

131 Ylitalo KR, Strotmeyer ES, Pettee Gabriel K, Lange-Maia BS, Avis NE, Karvonen-Gutierrez CA **Peripheral Nerve Impairment and Recurrent Falls Among Women: Results from the Study of Women's Health Across the Nation** J Gerontol A Biol Sci Med Sci. 2020 Sep 25;75(10):2020-2027. doi: 10.1093/gerona/glz211. PMID: 31549141 PMCID: PMC7518556
Primary Question: What is the relationship between peripheral nerve impairment and recurrent falls (and recurrent fall injuries) among early old age women?
Summary of Findings: Approximately one-quarter of participants had at least 4 peripheral nerve impairment symptoms or monofilament insensitivity. Peripheral nerve impairment may

identify those at high risk for falls, particularly among women during early late life.
[WG#909]

132 Appelhans BM, Lange-Maia BS, Pettee Gabriel K, Karvonen-Gutierrez C, Karavolos K, Dugan SA, Greendale GA, Avery EF, Sternfeld B, Janssen I, Kravitz HM **Body mass index versus bioelectrical impedance analysis for classifying physical function impairment in a racially diverse cohort of midlife women: The Study of Women's Health Across the Nation (SWAN)**
Aging Clin Exp Res. 2020 Sep;32(9):1739-1747. doi: 10.1007/s40520-019-01355-8. Epub 2019 Oct 4. PMID: 31584147 PMCID: PMC7125018
Primary Question: Can estimates of body fat and muscle mass derived from bioimpedance measures be used to accurately classify women with and without impairments in physical function?
Summary of Findings: Body mass index and percentage body fat do reasonably well for identifying women with impaired physical function. However, different cutpoints should be used for different racial/ethnic groups. Information on muscle mass does not improve the ability to classify women on physical function impairment.
[WG#885]

133 Nasr A, Matthews K, Brooks M, McConnell D, Orchard T, Billheimer J, Rader D, El Khoudary S. **Vasomotor Symptoms and Lipids/Lipoproteins in Midlife Women: Does Level of Endogenous Estradiol Matter? The SWAN HDL Ancillary Study** J Clin Lipidol Sep-Oct 2020;14(5):685-694.e2. doi: 10.1016/j.jacl.2020.07.002. Epub 2020 Jul 8. PMID: 32747311 PMCID: PMC7642056.
Primary Question: Are HDL and LDL metrics (HDL-C and LDL-C; HDL and LDL particles [HDL-P and LDL-P]; HDL and LDL size) related to vasomotor symptoms (VMS), and does endogenous estradiol affects this association?
Summary of Findings: After adjusting for potential confounders (age, site, race/ethnicity, education, menopausal status, physical activity, alcohol use and BMI), severe VMS was associated with smaller HDL size and higher LDL-C, compared to no VMS. Linear trends also showed additional associations between increased VMS and higher total LDL-P and intermediate LDL-P. Additional adjustment for endogenous estradiol attenuated these associations.
[WG#996]

134 Ding N, Harlow SD, Randolph JF, Calafat AM, Mukherjee B, Batterman S, Gold EB, Park SK **Associations between Perfluoroalkyl Substances and Incident Natural Menopause: the Study of Women's Health Across the Nation 1999-2017** J Clin Endocrinol Metab 2020 Sep 1;105(9):dgaa303. doi: 10.1210/clinem/dgaa303. PMID: 32491182 PMCID: PMC7418447
Primary Question: We examined the associations between PFAS exposures and incidence of natural menopause in the multi-racial/ethnic sample of women who were premenopausal at baseline from a prospective cohort, i.e., the Study of Women's Health Across the Nation (SWAN), with standard approximately annual clinic visits from 1999-2017, and assessed whether the relationship differed by racial/ethnic groups. We next identified subgroups exposed to different patterns of PFAS using the k-means clustering method and evaluated the combined effects of PFAS mixtures on natural menopause.
Summary of Findings:

[WG#877MS5]

135 Kim C, Saran R, Hood M, Karvonen-Gutierrez C, Peng MQ, Randolph JF Jr, Harlow SD **Changes in kidney function during the menopausal transition: the Study of Women's Health Across the Nation (SWAN) - Michigan site.** Menopause 2020 Sep;27(9):1066-1069. doi: 10.1097/GME.0000000000001579. PMID: 32852461
Primary Question: Does glomerular filtration rate change over the menopausal transition
Summary of Findings: GFR declines, but no more than would be expected by age Declines in GFR are associated with declines in FSH and SHBG but not with changes in sex steroids (estradiol, testosterone)

[WG#930]

136 Greendale GA, Witt-Enderby P, Karlamangla AS, Munmun F, Crawford S, Huang M, Santoro N. **Melatonin patterns and levels during the human menstrual cycle and after menopause** Journal of the Endocrine Society 2020 Aug 27;4(11):bvaa115. doi: 10.1210/jendso/bvaa115. PMID: 33094207; PMCID: PMC7566378.
Primary Question:
Is melatonin, a hormone that controls sleep-wake cycles in humans, also involved in the control of the menstrual cycle?
Do melatonin levels go down when women become postmenopausal?
Summary of Findings: We found a rise in aMT6s, a melatonin metabolite that appears in the urine, at the end of the menstrual cycle (just before menses occurs). We believe that melatonin helps to regulate the menstrual cycle. After menopause, the amount of melatonin in the urine declines, suggesting that a drop in melatonin may be partly responsible for some of the symptoms of menopause.
[WG#1026]

137 Pettee Gabriel K, Sternfeld B, Colvin AB, Lucas AR, Karvonen-Gutierrez CA, Gold EB, Crawford S, Greendale GA, Avis NE **The impact of breast cancer on physical activity from midlife to early older adulthood and predictors of change post-diagnosis** J Cancer Surviv 2020 Aug;14(4):545-555.doi: 10.1007/s11764-020-00879-7. Epub 2020 Mar 30. PMID: 32232722 PMCID: PMC7365759
Primary Question: The primary objectives of this study were to: 1) describe and compare changes in physical activity from pre- to post-diagnosis (or corresponding time period) in breast cancer survivors (BCS) and controls and 2) in BCS only, evaluate pre-diagnosis predictors of at-risk patterns of physical activity change, post-diagnosis (consistently low and decreased physical activity) to more effectively identify BCSs in greatest need of intervention or referral to physical activity programs.
Summary of Findings: The main findings of this study suggested that physical activity changes from pre- to post- breast cancer diagnosis were not statistically significantly different from similarly aged controls. While the majority (54.9%) of BCSs maintained sports/exercise physical activity levels post-diagnosis, 26.8% and 18.3% of BCSs increased and decreased physical activity post-diagnosis, respectively. Pre-diagnosis sleep problems and overweight/obesity status predicted decreased or consistently low physical activity post-diagnosis. Stage of breast cancer diagnosis and treatment were not statistically significant predictors of physical activity change, post-diagnosis.
[WG#863]

138 Lange-Maia BS, Karavolos K, Avery EF, Strotmeyer ES, Karvonen-Gutierrez CA, Appelhans BM, Janssen I, Dugan SA, Kravitz HM. **Contribution of Common Chronic Conditions to Midlife Physical Function Decline: The Study of Women's Health Across the Nation** Womens Midlife Health . 2020 Jul 28;6:6. doi: 10.1186/s40695-020-00053-0. eCollection 2020. PMID: 32742664 PMCID: PMC7385881
Primary Question:
Summary of Findings:
[WG#952MS2]

139 Wang X, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Harlow SD, Park SK **Urinary Metals and Incident Diabetes in Midlife Women: Study of Women's Health Across the Nation (SWAN)** BMJ Open Diabetes Research & Care 2020 Jul;8(1):e001233. doi: 10.1136/bmjdrc-2020-001233. PMID: 32747380 PMCID: PMC7398092
Primary Question:
Summary of Findings: Asian populations including both Chinese and Japanese women were found to have higher concentrations of arsenic, cadmium, copper, mercury, molybdenum, lead, thallium, compared with other racial/ethnic groups, independent of sociodemographic, lifestyle, dietary, and geographic characteristics. Intake of seafood and rice was associated with high concentrations of arsenic, cesium, mercury, molybdenum and lead in urine samples. Chinese women had the highest overall exposure compared with other racial/ethnic groups.
[WG#877_MS4]

140 Lange-Maia BS, Karvonen-Gutierrez CA, Kazlauskaite R, Strotmeyer ES, Karavolos K, Appelhans BM, Janssen I, Avery EF, Dugan SA, Kravitz HM **Impact of Chronic Medical Condition Development on Longitudinal Physical Function from Mid- to Early Late-Life: The Study of Women's Health Across the Nation** J Gerontol A Biol Sci Med Sci 2020 Jun 18;75(7):1411-1417. doi: 10.1093/gerona/glz243. PMID: 31732730 PMCID: PMC7302170
Primary Question: Does physical function change as women develop chronic conditions?
Summary of Findings: Physical function declined with the development of a new condition, and women who had more chronic conditions had a faster decline in physical function when they developed a new condition.
[WG#952]

141 Avis NE, Levine B, Goyal N, Crawford SL, Hess R, Colvin A, Bromberger JT, Greendale GA. **Health-related quality of life among breast cancer survivors and noncancer controls over 10 years: Pink SWAN.** Cancer Avis NE, Levine B, Goyal N, Crawford SL, Hess R, Colvin A, Bromberger JT, Greendale GA. Health-related quality of life among breast cancer survivors and noncancer controls over 10 years: Pink SWAN. Cancer. 2020 May 15;126(10):2296-2304. doi: 10.1002/cncr.32757. Epub 2020 Feb 27. PMID: 32105350; PMCID: PMC8559151.
Primary Question: What is the time course of HRQL among breast cancer survivors before and after their diagnosis and treatment and are breast cancer survivors at greater risk for lower HRQL post diagnosis than women without a history of cancer? What are the factors associated with HRQL following breast cancer diagnosis and treatment?
Summary of Findings: Breast cancer survivors had significantly lower HRQL, compared to non-cancer controls, at diagnosis and 1 year post-diagnosis. By 2 years post-diagnosis,

survivors and controls no longer differed significantly. Higher perceived stress prior to diagnosis, cigarette smoking, and and having >2 comorbidities were predictors of low HRQL after diagnosis.
[WG#926]

142 Anderson DJ, Chung HF, Seib CA, Dobson AJ, Kuh D, Brunner EJ, Crawford SL, Avis NE, Gold EB, Greendale GA, Mitchell ES, Woods NF, Yoshizawa T, Mishra GD **Obesity, smoking, and risk of vasomotor menopausal symptoms during menopause: a pooled analysis of eight cohort studies** Am J Obstet Gynecol 2020 May;222(5):478.e1-478.e17. PMCID: PMC7196035
Primary Question:
Summary of Findings:
[WG#1003PUD]

143 Matthews KA, Kravitz HM, Lee L, Harlow SD, Bromberger JT, Joffe H, Hall MH **Does mid-life aging impact women's sleep duration, continuity, and timing?: A longitudinal analysis from the Study of Women's Health Across the Nation.** Sleep. 2020 Apr 15;43(4):zsz259. doi: 10.1093/sleep/zsz259. PMID: 31633180 PMCID: PMC7157190
Primary Question: Does midlife aging across 12 years result in change in women's sleep duration, continuity, and timing as measured by actigraphy?
Summary of Findings: Mid-life aging is associated with improved sleep duration and wake after sleep onset, worse latency, and later sleep midpoint as measured by actigraphy; there is no change in self-reported sleep complaints. These results were independent of other changes in women's lives, including the menopausal transition, stress, and health problems.
[WG#942]

144 Samargandy S, Matthews KA, Brooks MM, Barinas-Mitchell E, Magnani JW, Janssen I, Hollenberg SM, El Khoudary SR **Arterial Stiffness Accelerates Within 1 Year of the Final Menstrual Period: The SWAN Heart Study** Arterioscler Thromb Vasc Biol 2020 Apr;40(4):1001-1008. doi: 10.1161/ATVBAHA.119.313622. PMID: 31969013. PMCID: PMC7101253.
Primary Question: When do women experience changes in arterial stiffness relative to the final menstrual period?
Summary of Findings: The results of this study showed that women experience increases in central arterial stiffness in the one year period surrounding the FMP. This increase is independent of aging, mid-life CVD risk factors, estradiol, and FSH.
[WG#896]

145 Kazlauskaite R, Janssen I, Wilson RS, Appelhans BM, Evans DA, Arvanitakis Z, El Khoudary SR, Kravitz HM **Is Midlife Metabolic Syndrome Associated With Cognitive Function Change? The Study of Women's Health Across the Nation.** J Clin Endocrinol Metab 2020 Apr 1;105(4):e1093-e1105. doi: 10.1210/clinem/dgaa067. PMID: 32083676 PMCID: PMC7059989
Primary Question:
Summary of Findings: An accelerated decline in perceptual (processing) speed, but not memory, may occur in women with metabolic syndrome at midlife. These changes in perceptual speed persisted after adjustment for sociodemographic factors (including site-race/ethnicity and education effects on time), and time-varying lifestyle, mood and

menopause covariates. Importantly, practice effects in cognitive testing substantially affected the models of perceptual speed up to 2 follow up cognitive assessments (or up to a mean 3.8±2.1 years after cognitive baseline).

In sum, our results indicate that metabolic syndrome accelerated 10-year decline in perceptual (processing) speed by an additional 6.4 years of aging, and persisted after adjustment for sociodemographic, lifestyle, mood and menopause factors.

[WG#759]

146 Finkelstein JS, Lee H, Karlamangla A, Neer RM, Sluss PM, Burnett-Bowie SM, Darakananda K, Donahoe PK, Harlow SD, Prizand SH, Joffe H, Kumar A, Martin DE, McConnell D, Merrilat S, Morrison A, Pastore LM, Randolph JF, Greendale GA, Santoro N **Anti-Mullerian Hormone and Impending Menopause in Late Reproductive Age: The Study of Women's Health Across the Nation.** J Clin Endocrinol Metab 2020 Apr 1;105(4):e1862-e1871. doi: 10.1210/clinem/dgz283. PMID: 31965189. PMCID: PMC7067546
Primary Question: How well does a single measurement antimullerian hormone (AMH) predict the time to a woman's final menstrual period (menopause)?
Summary of Findings: A single AMH level was able to help a woman know that she could become menopausal within as little as one year, depending on her age.
[WG#454]

147 Greendale GA, Huang M, Cauley JA, Liao D, Harlow S, Finkelstein JS, Hans D, Karlamangla AS **Trabecular Bone Score Declines During the Menopause Transition: the Study of Women's Health Across the Nation (SWAN).** J Clin Endocrinol Metab. 2020 Apr 1;105(4):e1872–82. doi: 10.1210/clinem/dgz056. PMID: 31613958; PMCID: PMC7069840.
Primary Question: Does trabecular bone score (which corresponds to bone strength) decline during the menopause transition?
Summary of Findings: Before the onset of the menopausal transition (MT), TBS was stable in White women with overall sample average BMI and age at final menstrual period (FMP). Decline in TBS began 1.5 years before the FMP, averaging 1.16% per year, a 10-fold change in rate. Two years after the FMP, the rate of TBS decline slowed, but did not stop, averaging 0.89% annually.
[WG#966]

148 Shieh A, Greendale GA, Cauley JA, Karlamangla AS **The Association between Fast Increase in Bone Turnover During the Menopause Transition and Subsequent Fracture** J Clin Endocrinol Metab 2020 Apr 1;105(4):e1440–8. doi: 10.1210/clinem/dgz281. PMID: 31840764; PMCID: PMC7067542.
Primary Question: Is faster increase in bone turnover during the menopause transition associated with future fracture?
Summary of Findings: Faster increase in bone turnover during the menopause transition is associated with future fracture.
[WG#946]

149 Stewart A, Sternfeld B, Lange-Maia B, Ylitalo K, Colvin A, Karvonen-Gutierrez C, Dugan S, Green R, Gabriel KP **Reported and Device-Based Physical Activity By Race/Ethnic Groups in Young-Old Women** Journal for the Measurement of Physical Behaviour. Stewart

A, Sternfeld B, Lange-Maia B, Ylitalo K, Colvin A, Karvonen-Gutierrez C, Dugan S, Green R, Gabriel KP. Reported and Device-Based Physical Activity By Race/Ethnic Groups in Young-Old Women. Journal for the Measurement of Physical Behaviour. 2020;3:1-10. doi: 10.1123/jmpb.2019-0062

Primary Question: How much does the self-reported physical activity questionnaire correlate with the accelerometer-measured physical activity in SWAN V? Is this correlation different in different racial or ethnic groups?
Summary of Findings: SWAN women are predominantly sedentary, but participate in significant amounts of low-light and high-light physical activity, which may have implications for their future physical health and function. The SWAN physical activity questionnaire had moderate correlation with accelerometry measures, with more frequent statistically significant correlations among white women for the sub-scores.
[WG#911]

150 Wang D, Karvonen-Gutierrez CA, Jackson EA, Elliott MR, Appelhans BM, Barinas-Mitchell E, Bielak LF, Huang MH, Baylin A. **Western Dietary Pattern Derived by Multiple Statistical Methods Is Prospectively Associated with Subclinical Carotid Atherosclerosis in Midlife Women** J Nutr. 2020 Mar 1;150(3):579-591. doi: 10.1093/jn/nxz270. PMID:31687759 PMCID: PMC7443736
Primary Question: Are dietary patterns during the midlife associated with measures of subclinical carotid atherosclerosis later in life?
Summary of Findings: Among midlife women, the adoption of a diet low in red meat, processed meat, deep-fried products, and sugar-sweetened beverages among midlife women may protect against future atherosclerosis.
[WG#871]

151 Kravitz HM, Matthews KA, Joffe H, Bromberger JT, Hall MH, Ruppert K, Janssen I. **Trajectory Analysis of Sleep Maintenance Problems in Midlife Women Before and After Surgical Menopause: The Study of Women's Health Across the Nation (SWAN).** Menopause 2020 Mar;27(3):278-288. doi: 10.1097/GME.0000000000001475. PMID:31934947 PMCID: PMC7047569
Primary Question:
Summary of Findings: We identified 4 groups of women who shared a common pattern of sleep maintenance problems throughout the observation period: low pre-surgery prevalence of frequent awakenings (33.5% of women), moderate prevalence (33.0%), increasing prevalence beginning pre-surgery (19.9%), and high prevalence. Frequent awakenings post-surgically in each of the 4 groups were significantly associated with their pre-surgical sleep maintenance problems, and except for one group (which included ~20% of the women) that had a pattern of increasing sleep maintenance problems, did not change during the post-surgery follow-up.
[WG#644A]

152 Lin HS, Naimi AI, Brooks MM, Richardson GA, Burke JG, Bromberger JT **Life-course impact of child maltreatment on midlife health-related quality of life in women: longitudinal mediation analysis for potential pathways** Ann Epidemiol 2020 Mar;43:58-65. doi: 10.1016/j.annepidem.2020.01.005. Epub 2020 Jan 18. PMID: 32127250 PMCID: PMC7153694

Primary Question: 1) Is child maltreatment associated with lower health-related quality of life (HRQoL) and quality-adjusted life years (QALY) and the rate of change in these measures over a 9-year follow-up?
2) Are these associations explained by adulthood psychosocial mediators over time?
Summary of Findings: Any CM was associated with both reduced midlife mental and physical HRQoL over 9 years. Compared to women without CM, women who experienced multiple CM types reported 5 and 4 points lower in MCS and PCS, respectively, and 28 fewer healthy days per year for QALY. But the rate of change over time in these measures was similar between women with and without CM. In longitudinal mediation analyses, low levels of optimism, sleep problems, and low social support each explained >10% of the relationship between multiple CM types and HRQoL and QALY.
[WG#814MS2]

153 Barinas-Mitchell E, Duan C, Brooks M, El Khoudary SR, Thurston RC, Matthews KA, Jackson EA, Lewis TT, Derby CA **Cardiovascular Disease Risk Factor Burden During the Menopause Transition and Late Midlife Subclinical Vascular Disease: Does Race/Ethnicity Matter?** JAHA. 2020 Feb 18;9(4):e013876. Epub 2020 Feb 17. PMID: 32063114. PMCID: PMC7070180
Primary Question: Does vascular health measured in late midlife differ by race and ethnicity? Does the effect of traditional risk factors measured from early to late midlife on vascular health differ by race and ethnicity?
Summary of Findings: In late midlife women carotid arterial measures of vascular remodeling and atherosclerosis vary by race/ethnicity. Compared to White women, measures of carotid arterial remodeling (CCA-IMT and IAD) were worse in Black women, similar in Hispanic women, and worse or similar in Chinese women; Yet, carotid plaque, a measure of atherosclerosis, was less prevalent in Black and Hispanic women and of similar prevalence in Chinese women. Despite the racial/ethnic inconsistency between subclinical vascular disease burden and cumulative CVD risk factors assessed across the menopause transition, there was no strong evidence that race or ethnicity consistently moderated the effects of traditional CVD risk factors on individual subclinical vascular disease indices.
[WG#694]

154 Bassiouni SS, White EM, Karvonen-Gutierrez CA, Harlow SD **Lack of food access and food consumption patterns of late midlife women in southeast Michigan** Michigan Journal of Public Health Bassiouni SS, White EM, Karvonen-Gutierrez CA, Harlow SD. Lack of food access and food consumption patterns in late midlife women in southeast Michigan. Michigan Journal of Public Health 2020;10(1):Article 8. Available at: https://scholarworks.gvsu.edu/mjph/vol10/iss1/8.
Primary Question:
Summary of Findings: Women who reported lack of food access were more likely to report making meals at home (p=0.021) but had less frequent consumption of fresh fruits, fresh vegetables, and lean meats as compared to those that did not report a lack of food access (p=0.04, p=0.001, p=0.048). Being African American (OR: 2.49; 95% CI: 1.20-5.17) and experiencing economic stress (OR: 2.86; 95% CI: 2.53-5.33) were major correlates of reporting lack of food access.
[WG#891]

155 Santoro N, El Khoudary SR, Nasr A, Gold EB, Greendale G, McConnell D, Neal-Perry G,

Pavlovic J, Derby C, Crawford S **Daily luteal serum and urinary hormone profiles in the menopause transition: Study of Women's Health Across the Nation** Menopause 2020 Feb;27(2):127-133. doi: 10.1097/GME.0000000000001453. PMID: 31794501; PMCID: PMC7050767.
Primary Question: Do blood levels of reproductive hormones match the levels that are seen in urine in midlife women, and is blood peak progesterone lower close to FMP, the same as urine progesterone?
Summary of Findings: Blood and urine hormones are closely related to each other in women in their 50's. Blood progesterone matches urine progesterone but the relationship is weak.
[WG#957]

156 Hutchins F, Abrams B, Brooks M, Colvin A, Moore Simas T, Rosal M, Sternfeld B, Crawford S **The Effect of Gestational Weight Gain across Reproductive History on Maternal Body Mass Index: The Study of Women's Health Across the Nation.** J Womens Health (Larchmt) 2020 Feb;29(2):148-157. doi: 10.1089/jwh.2019.7839. Epub 2019 Nov 27. PMID:31794347 PMCID:PMC7045562
Primary Question:
Summary of Findings: Our analysis found that each additional pregnancy a woman experienced with excessive gestational weight gain increased the odds of having an obese BMI at midlife, regardless of the total number of births in a woman's life.
[WG#410]

157 Ding N, Harlow SD, Batterman S, Mukherjee B, Park SK **Longitudinal trends in perfluoroalkyl and polyfluoroalkyl substances among multiethnic midlife women from 1999 to 2011: The Study of Women's Health Across the Nation** Environ Int. 2020 Feb;135:105381. doi: 10.1016/j.envint.2019.105381. Epub 2019 Dec 13. PMID: 31841808. PMCID: PMC7374929
Primary Question: This study examined temporal variations in serum concentrations of per- and polyfluoroalkyl substances (PFAS), a family of synthetic compounds widely used in a variety of industrial applications and consumer products, such as non-stick cookware, carpeting, apparels, food packaging, and firefighting forms, in midlife women. Specifically, we explored how patterns of exposure differ by race/ethnicity and reproductive characteristics.
Summary of Findings: Serum concentrations of legacy compounds (e.g. perfluorooctanoic acid, PFOA, and perfluorooctane sulfonic acid, PFOS) decreased significantly; whereas their replacements (e.g. perfluorononanoic acid, PFNA) increased from 1999-2011. Temporal variations varied significantly by race/ethnicity. For example, Chinese women tended to have consistently higher PFNA concentrations at each follow-up visit, compared to white and black women. Menstruating women also had lower concentrations over time. Parity was associated with lower concentrations at baseline but the differences between nulliparous and parous women narrowed during the follow-up visits.
[WG#877MS3]

158 Shieh, A., Epeldegui, M., Karlamangla, A. S., Greendale, G. A **Gut permeability, inflammation, and bone density across the menopause transition** JCI insight 2020 Jan 30;5(2):e134092. doi: 10.1172/jci.insight.134092. PMID: 31830000 PMCID: PMC7098720
Primary Question: Does gut permeability increase during the menopause transition?
Summary of Findings:

Gut permeability increases during the menopause transition, and higher gut permeability is associated with more inflammation and lower bone mineral density

[WG#1002]

159 Harlow SD, Elliott MR, Bondarenko I, Thurston RC, Jackson EA **Monthly variation of hot flashes, night sweats, and trouble sleeping: effect of season and proximity to the final menstrual period (FMP) in the SWAN Menstrual Calendar substudy** Menopause. 2020 Jan;27(1):5-13. doi: 10.1097/GME.0000000000001420. PMID: 31567864 PMCID: PMC6934911
Primary Question: Does reporting of menopausal symptoms vary by season.
Summary of Findings: Reporting of hot flashes, night sweats and trouble sleeping varied by season, with peaks in reporting occurring around the time of the summer solstice (longest period of daylight) and troughs occurring around the time of the winter solstice (shortest period of daylight).
[WG#744]

160 Shieh A, Greendale GA, Cauley JA, Karvonen-Gutierrez C, Crandall CJ, Karlamangla AS. **Estradiol and Follicle-Stimulating Hormone as Predictors of Onset of Menopause Transition-Related Bone Loss in Pre- and Perimenopausal Women** J Bone Miner Res 2019 Dec;34(12):2246-2253. doi: 10.1002/jbmr.3856. Epub 2019 Oct 24. PMID: 31442329
Primary Question: Can measuring estradiol or follicle stimulating hormone help identify who will experience loss of bone mineral density by the next year?
Summary of Findings: Measuring follicle stimulating hormone can help identify who will experience significant loss of bone mineral density by the next year.
[WG#894]

161 Shieh A, Ishii S, Greendale GA, Cauley JA, Karvonen-Gutierrez C, Karlamangla AS **A bone resorption marker as predictor of rate of change in femoral neck size and strength during the menopause transition.** Osteoporosis Int. 2019 Dec;30(12):2449-2457. doi: 10.1007/s00198-019-05099-z. Epub 2019 Aug 31. PMID: 31473793 PMCID: PMC6879851
Primary Question:
Summary of Findings: Check a marker of bone breakdown after women begin to experience less predictable menstrual bleeding helps predict how fast a woman will lose hip strength during the menopause transition.
[WG#881]

162 El Khoudary SR, Chen X, Nasr A, Shields K, Barinas-Mitchell E, Janssen I, Everson-Rose SA, Powell L, Matthews K. **Greater Periaortic Fat Volume at Midlife Is Associated with Slower Gait Speed Later in Life in Women: The SWAN Cardiovascular Fat Ancillary Study** J Gerontol A Biol Sci Med Sci. 2019 Nov 13;74(12):1959–1964. doi:10.1093/gerona/glz095. PMID: 30977813 PMCID: PMC6853654
Primary Question:
Summary of Findings: Greater volume of peri-aortic fat (PVAT) in women at midlife were associated with lower gait speed later in life, independent of overall adiposity, comorbid conditions and other possible confounders.
[WG#882]

163 Zhu D, Chung H-F, Dobson A-J, Pandeya N, Giles GG, Bruinsma F, Brunner EJ, Kuh D, Hardy R, Crawford SL, Avis NE, Gold EB, Derby CA, Matthews KA, Cade JE, Greenwood DC, Demakakos P, Brown DE, Sievert LL, Anderson D, Hayashi K, Lee JS, Mizunuma H, Tillin T, Simonsen MK, Adami HO, Weiderpass E, Mishra GD **Age at natural menopause and risk of incident cardiovascular disease: A pooled analysis of data from 15 studies.** The Lancet Public Health 2019 Nov;4(11):e553-e564. doi: 10.1016/S2468-2667(19)30155-0. Epub 2019 Oct 3. PMID: 31588031 PMCID: PMC7118366
Primary Question:
Summary of Findings:
[WG#980PUD]

164 Stewart A, Barinas-Mitchell EJ, Matthews KA, El Khoudary SR, Magnani JM, Jackson EA, Brooks MM **Social Role-Related Stress and Social Role-Related Reward as Related to Subsequent Subclinical Cardiovascular Disease in a Longitudinal Study of Midlife Women: The Study of Women's Health Across the Nation** Psychosom Med 2019 Nov/Dec;81(9):821-832. doi: 10.1097/PSY.0000000000000733. PMID: 31299023 PMCID: PMC6832794
Primary Question:
Summary of Findings:
[WG#850]

165 Cortés YI, Catov JM, Brooks M, El Khoudary SR, Thurston RC, Matthews KA, Isasi CR, Jackson EA, Barinas-Mitchell E. **Pregnancy-related events associated with subclinical cardiovascular disease burden in late midlife: SWAN.**
Atherosclerosis 2019 Oct;289:27-35. Epub 2019 Jul 30. PMID: 31446211 PMCID: PMC6952268
Primary Question:
Summary of Findings: Women with a history of gestational hypertension/preeclampsia have a more adverse subclinical CVD index in late midlife even after accounting for traditional cardiovascular risk factors. Women with a history of gestational diabetes may have greater arterial stiffness in late midlife. Earlier age at first birth does not appear to be associated with subclinical CVD after adjusting for traditional cardiovascular risk factors.
[WG#854]

166 Lange-Maia BS, Karvonen-Gutierrez C, Strotmeyer ES, Avery EF, Appelhans BM, Fitzpatrick SL, Janssen I, Dugan SA, Kravitz HM **Factors Influencing Longitudinal Stair Climb Performance from Midlife to Early Late Life: The Study of Women's Health Across the Nation Chicago and Michigan Sites** J Nutr Health Aging 2019;23(9):821-828. doi: 10.1007/s12603-019-1254-2. PMID: 31641731 PMCID PMC6818752
Primary Question: How does physical function change as women transition from mid- to late-life, and does physical function change at a different rate over time based upon physical acitvity participation, race, and other health factors?
Summary of Findings: Overall women's stair climb time got slower over the follow-up period. We found that higher levels of physical activity were associated with better performance on the stair climb test over time. Also, compared to white women, black women on average had slower stair climb times, which is consistent with some other studies which have shown racial disparities in physical function between white and black women.

[WG#828]

167 Dusendang JR, Reeves AN, Karvonen-Gutierrez CA, Herman WH, Ylitalo KR, Harlow SD **The association between perceived discrimination in midlife and peripheral neuropathy in a population-based cohort of women: the Study of Women's Health Across the Nation** Ann Epidemiol 2019 Sep;37:10-16. doi: 10.1016/j.annepidem.2019.07.012. Epub 2019 Jul 27. PMID: 31447292 PMCID: PMC6755046
Primary Question:
Summary of Findings: There is a significant association between perceived discrimination and peripheral neuropathy (Odds ratio = 1.29, 95% CI 1.01, 1.66) and this association is 28.3% (95% CI 17.1, 36.5%) mediated by body mass index.
[WG#913]

168 Park SK, Peng Q, Ding N, Mukherjee B, Harlow S **Determinants of per- and polyfluoroalkyl substances (PFAS) in midlife women: Evidence of racial/ethnic and geographic differences in PFAS exposure** Environ Res. 2019 Aug;175:186-199. doi: 10.1016/j.envres.2019.05.028. Epub 2019 May 18. PMID: 31129528 PMCID: PMC6579633
Primary Question:
Summary of Findings:
[WG#877_MS2]

169 Wang DQ, Karvonen-Gutierrez CA, Jackson EA, Elliott MR, Appelhans B, Barinas-Mitchell EJ, Bielak L, Baylin A **Prospective associations between beverage intake during the midlife and subclinical carotid atherosclerosis: The Study of Women's Health Across the Nation** PLoS One 2019 Jul 10;14(7):e0219301. doi: 10.1371/journal.pone.0219301. eCollection 2019. PMID: 31291324 PMCID: PMC6620009
Primary Question:
Summary of Findings: Coffee intake during the midlife in women is associated with a larger CCA-IMT in the future except among women who consumed more than 4 cups of coffee per day. Moderate alcohol intake is associated with a smaller CCA-IMT later in life.
[WG#805]

170 Mitchell DM, Ruppert K, Udupa N, Bassir F, Darakananda K, Solomon DH, Lian Y, Cauley JA, Karlamangla AS, Greendale GA, Finkelstein JS, Burnett-Bowie SM. **Temporal increases in 25-hydroxyvitamin D in midlife women: Longitudinal results from the Study of Women's Health Across the Nation (SWAN)** Clin Endocrinol (Oxf) 2019 Jul;91(1):48-57. doi: 10.1111/cen.13986. Epub 2019 Apr 24. PMID:30972777 PMCID:PMC6565441
Primary Question:
Summary of Findings:
[WG#758]

171 Solomon, DH, Ruppert, K, Kazlauskaite, R. Finkelstein, J, Habel, LA **Blood Pressure Lowering Medication initiation and Fracture Risk: A SWAN Pharmacoepidemiology Study** Arch Osteoporos 2019 Jun 28;14(1):73. doi: 10.1007/s11657-019-0618-x. PMID: 31254147
Primary Question:
Summary of Findings: There was evidence of an increased risk in fractures among women

initiating blood pressure lowering medications compared to those initiating anti-depressants. This is likely related to an increased risk of falling.
[WG#887]

172 Moody DLB, Chang YF, Pantesco EJ, Darden TM, Lewis TT, Brown C, Bromberger JT, Matthews KA **Everyday Discrimination Prospectively Predicts Blood Pressure across 10 Years in Racially/Ethnically Diverse Midlife Women: Study of Women's Health Across the Nation** Ann Behav Med. 2019 Jun 4;53(7):608-620. doi: 10.1093/abm/kay069. PMID: 30247506; PMCID: PMC6428619.
Primary Question:
Summary of Findings: Higher exposure to everyday discrimination at baseline predicted elevated SBP and DBP over the 10-year period in semi-adjusted (including age and time) and fully-adjusted models (also including site, visit, race/ethnicity, education, family history of hypertension, smoking status, medication use, and menopausal and diabetes status). All associations were attenuated upon adjustment for BMI. These associations did not vary by race/ethnicity and models did not predict HTN risk.
[WG#431]

173 Duan C, Talbott EO, Broadwin R, Brooks M, Matthews K, Barinas-Mitchell E **Residential Exposure to PM2.5 and Ozone and Progression of Subclinical Atherosclerosis Among Women Transitioning Through Menopause: The Study of Women's Health Across the Nation.** J Womens Health (Larchmt). 2019 Jun;28(6):802-811. doi: 10.1089/jwh.2018.7182. Epub 2019 Feb 7. PMID: 30730252 PMCID: PMC6590715.
Primary Question:
Summary of Findings: Among midlife women PM2.5 independently contributed to progression of maximum CIMT, a marker of subclinical atherosclerosis. PM2.5 related to plaque index progression after adjusting for socioeconomic factors, but not after adjusting for other traditional cardiovascular risk factors. There was no association between ozone (O3) and progression of subclinical atherosclerosis biomarkers.
[WG#819]

174 Cauley JA, Ruppert K, Lian Y, Finkelstein JS, Karvonen-Gutierrez CA, Harlow SD, Lo JC, Burnett-Bowie SA, Karlamangla A, Greendale GA. **Serum Sex Hormones and the Risk of Fracture Across the Menopausal Transition: Study of Women's Health Across the Nation.** J Clin Endocrinol Metab 2019 Jun 1;104(6):2412-2418. doi: 10.1210/jc.2018-02047. PMID: 30690517 PMCID: PMC6505454
Primary Question:
Summary of Findings: We found an inverse association between serum estrogen levels and subsequent fractures: Women whose estradiol level was twice as high as another had a 10% lower risk of fracture
[WG#849]

175 Wang X, Mukherjee B, Batterman S, Harlow SD, Park SK **Urinary metals and metal mixtures in midlife women: The Study of Women's Health Across the Nation (SWAN)** Int J Hyg Environ Health 2019 Jun;222(5):778-789. doi: 10.1016/j.ijheh.2019.05.002. Epub 2019 May 15. PMID: 31103473. PMCID: PMC6583796.
Primary Question:
Summary of Findings: Asian populations including both Chinese and Japanese women

were found to have higher concentrations of arsenic, cadmium, copper, mercury, molybdenum, lead, thallium, compared with other racial/ethnic groups, independent of sociodemographic, lifestyle, dietary, and geographic characteristics. Intake of seafood and rice was associated with high concentrations of arsenic, cesium, mercury, molybdenum and lead in urine samples. Chinese women had the highest overall exposure compared with other racial/ethnic groups.
[WG#877]

176 Nagaraj N, Boudreau RM, Danielson ME, Greendale GA, Karlamangla AS, Beck TJ, Cauley JA **Longitudinal Changes in hip geometry in relation to the Final Menstrual Period: Study of Women's Health Across the Nation(SWAN)** Bone 2019 May;122:237-245. doi: 10.1016/j.bone.2019.02.016. Epub 2019 Mar 3. PMID: 30840919 PMCID: PMC6518417
Primary Question:
Summary of Findings: Our study showed that the HSA parameters showed accelerated change around the time of the FMP, i.e., 2 years before to 1 year after the FMP (transmenopausal period). The HSA parameters, bone mineral density(BMD), cross sectional area (CSA) and Section modulus (SM) showed significant decline in the transmenopausal period and over the 10-year period, while outer diameter (OD) and buckling ratio (BR) showed significant increase. In addition, the results reflected the racial/ethnic differences in the hip geometry and its changes over time with Caucasian women suffering largest change both during the transmenopausal period and over 10 years. The rate of change of these parameters could contribute to further understanding of the increased fracture risk with age.
[WG#539]

177 Matthews KA, Hall MH, Lee L, Kravitz HM, Chang Y, Appelhans BM, Swanson LM, Neal-Perry GS, Joffe H. **Racial/ethnic disparities in women's sleep duration, continuity, and quality, and their statistical mediators: Study of Women's Health Across the Nation.** Sleep 2019 May 1;42(5):zsz042. doi: 10.1093/sleep/zsz042. PMID: 30778560 PMCID: PMC6519910.
Primary Question:
Summary of Findings: Whites had longer sleep duration than other racial/ethnic groups; less wake after sleep onset (WASO) than Black or Hispanic women, and better sleep quality than Chinese or Japanese women. For WASO differences by White vs Black or Hispanic women, significant mediators included concurrent number of health problems, physical inactivity, proportion of nights reporting vasomotor symptoms, number of life stressors, and financial hardship and increasing number of health problems and life stressors from baseline to sleep study. For perceived sleep quality differences by White vs Chinese or Japanese, significant mediators included positive affect, depressive symptoms, and increasing in depressive symptoms from baseline to the sleep study. For racial/ethnic differences in sleep duration, only concurrent financial hardship served as a significant mediator for Whites vs Hispanics.
[WG#888]

178 Ward E, Gold EB, Johnson WO, Ding F, Chang PY, Song P, El Khoudary SR, Karvonen-Gutierrez C, Ylitalo KR, Lee JS. **Patterns of Cardiometabolic Health as Midlife Women Transition to Menopause: A Prospective Multiethnic Study.** J Clin Endocrinol Metab 2019 May 1;104(5):1404-1412. doi: 10.1210/jc.2018-00941. PMID: 30365014 PMCID: PMC6426833

Primary Question:
Summary of Findings: Constellations over time of cardiometabolic risk components in midlife women depend on race/ethnicity but apparently not stage of menopausal transition. Physical activity is associated with a decreased risk of various common constellations and less dietary caloric intake is associated with recovery from metabolic syndrome over an average of 5 years.

[WG#752]

179 Mishra GD, Chung HF, Pandeya N, Kuh D, Hayashi K, Lee JS, Mizunuma H, Crawford SL, Avis NE, Gold EB, Mitchell ES, Woods NF, Anderson D, Brown DE, Sievert LL, Brunner EJ, Demakakos P, Cade JE, Greenwood DC, Giles GG, Bruinsma F, Cooper R, Hardy R, Tillin T, Obermeyer CM, Simonsen MK, Canonico M, Ancelin ML, Schoenaker DAJM, Adami HO, Weiderpass E, Dobson AJ **Variations in reproductive events across life: a pooled analysis of data from 505 147 women across 10 countries.** Hum Reprod 2019 May 1;34(5):881-893. doi: 10.1093/humrep/dez015. PMID: 30835788.
Primary Question:
Summary of Findings:
[WG#786PUD]

180 Harlow SD, Karvonen-Gutierrez C, Elliott MR, Bondarenko I, Avis NE, Bromberger JT, Brooks MM, Miller JM, Reed BD **It is not just menopause: symptom clustering in the Study of Women's Health Across the Nation** Women's Midlife Health doi:10.1186/s40695-017-0021-y
Primary Question:
Summary of Findings: We identified six latent symptom classes that ranged from highly or moderately symptomatic across all measured symptoms, to moderately symptomatic for a subset of symptoms that might be denominated as vasomotor symptoms, pain, fatigue, and sleep disturbances, to mildly symptomatic across most symptoms measured, to minimally symptomatic. The least symptomatic latent class reported only a few, very mild fatigue, pain and sleep disturbances symptoms. Notably, vasomotor symptoms tended to cluster with symptoms of sleep disturbances and fatigue. Although women did both worsen and improve across the midlife, women tended to track within latent class and menopausal stage did not influence the probability of transition from one latent class to another. Notably fully one-quarter of the women were highly or moderately symptomatic across all measured symptoms in the pre-menopause and the more symptomatic latent classes was strongly associated with worse self-reported health.
[WG#806]

181 Duan C, Talbott EO, Brooks MM, Park SK, Broadwin R, Matthews KA, Barinas-Mitchell E **Five-year exposure to PM2.5 and ozone and subclinical atherosclerosis in late midlife women: The Study of Women's Health Across the Nation.** Int J Hyg Environ Health 2019 Mar;222(2):168-176. doi: 10.1016/j.ijheh.2018.09.001. Epub 2018 Sep 17. PMID: 30236459 PMCID: PMC6408975.
Primary Question:
Summary of Findings: Long-term exposure to PM2.5 in early mid-life independently contributes to atherosclerosis as measured by mean of maximum CCA at later mid-life in

multi-ethnic population based cohort of women. However, we did not observe the effect of ozone. And, no association between air pollution and plaque or plaque index was established.
[WG#819E]

182 Greendale GA, Sternfeld B, Huang MH, Han W, Karvonen-Gutierrez C, Ruppert K, Cauley JA, Finkelstein JS, Jiang SF, Karlamangla A **Changes in body composition and weight during the menopause transition.**
JCI insight 2019 Mar 7;4(5):e124865. doi: 10.1172/jci.insight.124865. PMID: 30843880 PMCID: PMC6483504
Primary Question:
Summary of Findings: In the average woman, fat and lean mass increased prior to the menopause transition (MT). At the start of the MT, the rate of fat gain doubled and lean mass started to decline; gains and losses, respectively, continued until 2 years after the final menstrual period. Weight climbed linearly during premenopause without acceleration at the beginning of the MT; it stabilized (there was no further increase) after the MT
[WG#484]

183 Aharon DA, Friedman EG, Overbey JR, McLaughlin M, Langaee T, Thurston RC **The association of an alpha2C adrenoreceptor gene polymorphism with vasomotor symptoms in African American women.** Menopause 2019 Mar;26(3):300-305. doi: 10.1097/GME.0000000000001218. PMID: 30277919 PMCID: PMC6389394
Primary Question:
Summary of Findings: The alpha2C del (322-325) genotype was not associated with increased frequency or bother of VMS, hot flashes, or night sweats, in African American women.
[WG#918]

184 Wu X, Broadwin R, Basu R, Malig B, Ebisu K, Gold EB, Qi L, Derby C, Park SK, Green S **Associations between fine particulate matter and changes in lipids/lipoproteins among midlife women.** Sci Total Environ 2019 Mar 1;654:1179-1186. doi: 10.1016/j.scitotenv.2018.11.149. Epub 2018 Nov 11. PMID: 30841392 PMCID: PMC6413864
Primary Question:
Summary of Findings:
[WG#856]

185 Bromberger JT, Schott LL, Avis NE, Crawford S, Harlow S, Joffe H, Kravitz HM, Matthews K. **Psychosocial and health-related risk factors for depressive symptom trajectories among midlife women over 15 years: Study of Women's Health Across the Nation (SWAN).** Psychol Med 2019 Jan;49(2):250-259. doi: 10.1017/S0033291718000703. Epub 2018 Apr 6. PMID: 29622056 PMCID: PMC6545593.
Primary Question:
Summary of Findings: We identified 7 trajectories which we reduced to 5: very low symptoms, consistently low symptoms, increasing symptoms, decreasing symptoms, consistently elevated symptoms. multiple time-invariant and time-varying factors significantly distinguished among the trajectories.
[WG#719]

186 Shieh A, Greendale GA, Cauley JA, Karvonen-Gutierrez C, Lo JC, Karlamangla AS **Urinary N-Telopeptide as Predictor of Onset of Menopause-Related Bone Loss in Pre- and Perimenopausal Women.** J Bone Miner Res Plus 2018 Dec 30;3(4):e10116. doi: 10.1002/jbm4.10116. eCollection 2019 Apr. PMID: 31044185 PMCID: PMC6478585
Primary Question:
Summary of Findings: Measuring a marker of bone breakdown in the urine when women are having regular or just starting to have irregular menstrual cycles may help identify who will experience loss in bone mineral density over the next several years.
[WG#880]

187 Crawford SL, Crandall CJ, Derby CA, El Khoudary SR, Waetjen LE, Fischer M, Joffe H. **Menopausal Hormone Therapy Trends Before Versus After 2002: Impact of the Women's Health Initiative Study Results** Menopause 2018 Dec 21;26(6):588-597. doi: 10.1097/GME.0000000000001282. PMID: 30586004 PMCID: PMC6538484
Primary Question:
Summary of Findings: Immediate post-WHI recommendations for ET use were widely adopted. Contrary to current clinical guidelines, however, women with frequent vasomotor symptoms, were less likely post-WHI to use ET.
[WG#890]

188 Wang D, Jackson E, Karvonen-Gutierrez C, Elliott M, Harlow S, Hood M, Derby C, Sternfeld B, Janssen I, Crawford S, Huang M-H, El Khoudary S, Chae C, Baylin A **Healthy Lifestyle During the Midlife Is Prospectively Associated With Less Subclinical Carotid Atherosclerosis: The Study of Women's Health Across the Nation.** J Am Heart Assoc 2018 Dec 4;7(23):e010405. doi: 10.1161/JAHA.118.010405. PMID: 30482079. PMCID: PMC6405552
Primary Question:
Summary of Findings: A healthy lifestyle during midlife is associated with less subclinical atherosclerosis in women later in life. Among the three individual components of the HLS, abstinence from smoking had the strongest association with the measures of subclinical atherosclerosis.
[WG#700]

189 Mitchell CM, Waetjen LE **Genitourinary Changes with Aging** Obstet Gynecol Clin North Am. 2018 Dec;45(4):737-750. doi: 10.1016/j.ogc.2018.07.010. Epub 2018 Oct 25. PMID: 30401554
Primary Question:
Summary of Findings:
[WG#960E]

190 Bromberger JT, Epperson CN **Depression During and After the Perimenopause: Impact of Hormones, Genetics, and Environmental Determinants of Disease** Obstet Gynecol Clin North Am 2018 Dec;45(4): 663-678. doi: 10.1016/j.ogc.2018.07.007. Epub 2018 Oct 25. PMID: 30401549 PMCID: PMC6226029
Primary Question:
Summary of Findings:
[WG#960D]

191 Hanley C, Shields KJ, Matthews KA, Brooks MM, Janssen I, Budoff MJ, Sekikawa A, Mulukutla S, El Khoudary SR. **Associations of cardiovascular fat radiodensity and vascular calcification in midlife women: The SWAN cardiovascular fat ancillary study.** Atherosclerosis 2018 Dec;279:114-121. doi: 10.1016/j.atherosclerosis.2018.09.001. Epub 2018 Sep 8. PMID: 30241697. PMCID: PMC6295258
Primary Question:
Summary of Findings: Women in the lowest TAT radiodensity tertile were significantly more likely to be White and to have adverse cardiovascular risk factors. Independent of cardiovascular risk factors, women in the middle and high TAT radiodensity tertiles were less likely to have CAC. Although adjusting for BMI attenuated the overall association, women in the middle TAT radiodensity tertile remained at significantly lower odds of CAC when compared to women in the low radiodensity tertile.

[WG#755]

192 El Khoudary SR, Thurston RC **Cardiovascular Implications of the Menopause Transition: Endogenous Sex Hormones and Vasomotor Symptoms.** Obstet Gynecol Clin North Am. 2018 Dec;45(4):641-661. doi: 10.1016/j.ogc.2018.07.006. Epub 2018 Oct 25. PMID: 30401548
Primary Question:
Summary of Findings:
[WG#960F]

193 Dugan SA, Gabriel KP, Lange-Maia BS, Karvonen-Gutierrez C **Physical Activity and Physical Function: Moving and Aging.** Obstet Gynecol Clin North Am 2018 Dec;45(4):723-736. doi: 10.1016/j.ogc.2018.07.009. Epub 2018 Oct 25. PMID: 30401553 PMCID: PMC6226270.
Primary Question:
Summary of Findings:
[WG#960C]

194 Harlow SD **Menstrual Cycle Changes as Women Approach the Final Menses: What Matters?**
Obstet Gynecol Clin North Am 2018 Dec;45(4):599-611. doi: 10.1016/j.ogc.2018.07.003. Epub 2018 Oct 25. PMID: 30401545
Primary Question:
Summary of Findings:
[WG#960H]

195 Allshouse AA, Pavlovic J, Santoro N **Menstrual Cycle Hormone Changes Associated with Reproductive Aging and How They May Relate to Symptoms** Obstet Gynecol Clin North Am 2018 Dec;45(4):613-628. doi: 10.1016/j.ogc.2018.07.004. Epub 2018 Oct 25. PMID:30401546 PMCID: PMC6226272
Primary Question:
Summary of Findings:

[WG#960J]

196 Karlamangla AS, Burnett-Bowie SM, Crandall CJ **Bone Health During the Menopause Transition and Beyond.** Obstet Gynecol Clin North Am 2018 Dec;45(4):695-708. doi: 10.1016/j.ogc.2018.07.012. Epub 2018 Oct 25. PMID: 30401551 PMCID: PMC6226267
Primary Question:
Summary of Findings:
[WG#960G]

197 Lin HS, Naimi AI, Brooks MM, Richardson GA, Burke JG, Bromberger JT **Child maltreatment as a social determinant of midlife health-related quality of life in women: do psychosocial factors explain this association?** Qual Life Res 2018 Dec;27(12):3243-3254. doi: 10.1007/s11136-018-1937-x. Epub 2018 Aug 18. PMID:30121897 PMCID: PMC7366611
Primary Question:
Summary of Findings: Childhood maltreatment was a robust risk factor for reduced midlife mental and physical HRQoL in women. The association between CM and HRQoL MCS was partially explained by the proximal adulthood psychosocial mediators: depressive symptoms, very upsetting life events, or low social support.

[WG#814]

198 Avis NE, Crawford SL, Green R. **Vasomotor symptoms across the menopause transition: Differences among women** Obstet Gynecol Clin North Am 2018 Dec;45(4):629-640. doi: 10.1016/j.ogc.2018.07.005. Epub 2018 Oct 25. PMID 30401547. PMCID: PMC6226273
Primary Question:
Summary of Findings:
[WG#960A]

199 Santoro N, Kravitz H **The Disruptive Changes of Midlife: A Biopsychosocial Adventure.** Obstet Gynecol Clin North Am. 2018 Dec;45(4):xv-xvii. doi: 10.1016/j.ogc.2018.08.001. Epub 2018 Oct 25. PMID: 30401557
Primary Question:
Summary of Findings:
[WG#960I]

200 Kravitz HM, Kazlauskaite R, Joffe H **Sleep, Health, and Metabolism in Midlife Women and Menopause: Food for Thought.** Obstet Gynecol Clin North Am 2018 Dec;45(4):679-694. doi: 10.1016/j.ogc.2018.07.008. Epub 2018 Oct 25. PMID: 30401550 PMCID: PMC6338227
Primary Question:
Summary of Findings:
[WG#960B]

201 Zhu D, Chung HF, Pandeya N, Dobson AJ, Cade JE, Greenwood DC, Crawford SL, Avis NE, Gold EB, Mitchell ES, Woods NF, Anderson D, Brown DE, Sievert LL, Brunner EJ, Kuh D,

Hardy R, Hayashi K, Lee JS, Mizunuma H, Giles GG, Bruinsma F, Tillin T, Simonsen MK, Adami HO, Weiderpass E, Canonico M, Ancelin MK, Tillin T, Simonsen MK, Adami HO, Weiderpass E, Canonico M, Ancelin ML, Demakakos P, Mishra GD **Relationships between intensity, duration, cumulative dose, and timing of smoking with age at menopause: a pooled analysis of individual data from 17 observational studies.** PLoS Medicine 2018 Nov 27;15(11):e1002704. doi: 10.1371/journal.pmed.1002704. eCollection 2018 Nov. PMID: 30481189 PMCID: PMC6258514
Primary Question:
Summary of Findings:
[WG#987PUD]

202 Chung HF, Pandeya N, Dobson A, Kuh D, Brunner E, Crawford S, Avis N, Gold EB, Mitchell E, Woods NF, Bromberger J, Thurston R, Joffe H, Yoshizawa T, Anderson D, Mishra G, **The role of sleep difficulties in the vasomotor menopausal symptoms and depressed mood relationships: an international pooled analysis of eight studies in the InterLACE consortium** Psychology of Medicine 2018 Nov;48(15):2550-2561. doi: 10.1017/S0033291718000168. Epub 2018 Feb 12. PMID: 29429422 PMCID: PMC6087679
Primary Question:
Summary of Findings: In this pooled study that included 21,312 midlife women from eight observational studies, we observed a prospective bi-directional relationship between VMS and depressed mood. Baseline sleep difficulties largely affected the relationship between VMS and subsequent depressed mood over three years, but it had little impact on the relationship between depressed mood and subsequent VMS.
[WG#843PUD]

203 Everson-Rose SA, Clark CJ, Wang Q, Guo H, Mancuso P, Kravitz HM, Bromberger JT. **Depressive symptoms and adipokines in women: Study of Women's Health Across the Nation.** Psychoneuroendocrinology 2018 Nov;97:20-27. doi: 10.1016/j.psyneuen.2018.07.011. Epub 2018 Jul 5. PMID: 30005278 PMCID: PMC6300165
Primary Question:
Summary of Findings: Depressive symptoms measured at the start of the study were associated with 1 of the 2 hormones we assessed – i.e., with adiponectin but not with leptin. Women who reported more depressive symptoms at baseline had lower levels of adiponectin, an anti-inflammatory hormone, both at baseline and at subsequent follow-up visits, compared to women with few or no depressive symptoms at baseline. However, we did not find a greater decline in concentrations of adiponectin over time for women with more depressive symptoms – that is, depression did not accelerate the rate of change in adiponectin over the 5-year study period. The study findings indicate depression is associated with a "dampening" of adiponectin levels in middle-aged women, which may help explain how depression affects risk for heart disease and diabetes in women as they age.
[WG#534]

204 Avis NE, Zhao X, Johannes CB, Ory M, Brockwell S, Greendale GA. **Correlates of sexual function among multi-ethnic middle-aged women: results from the Study of Women's Health Across the Nation (SWAN).** Menopause 2018 Nov;25(11):1244-1255. doi: 10.1097/GME.0000000000001226. PMID: 30358720
Primary Question:
Summary of Findings:

[WG#103B]

205 Avis NE, Colvin A, Bromberger JT, Hess R. **Midlife Predictors of Health-Related Quality of Life (HRQL) in Older Women** J Gerontol A Biol Sci Med Sci. 2018 Oct 8;73(11):1574-1580. doi: 10.1093/gerona/gly062. PMID: 29596565 PMCID: PMC6175022
Primary Question:
Summary of Findings: With aging, physical health scores declined and mental health scores improved. Increasing physical activity, lowering BMI, not smoking, and improving sleep are modifiable factors at mid-age that are associated with better HRQL.
[WG#801]

206 Khan ZA, Janssen I, Mazzarelli JK, Powell LH, Dumasius A, Everson-Rose SA, Barinas-Mitchell E, Matthews K, El Khoudary SR, Weinstock PJ, Hollenberg SM **Serial Studies in Subclinical Atherosclerosis During Menopausal Transition (from the Study of Women's Health Across the Nation).** Am J Cardiol 2018 Oct 1;122(7):1161-1168. doi: 10.1016/j.amjcard.2018.06.039. Epub 2018 Jul 4. PMID: 30077316 PMCID: PMC6345556
Primary Question:
Summary of Findings: All women in the cohort had an increase in their morphologic indices of subclinical atherosclerosis assessed by carotid artery inner lining thickness and coronary artery calcium from baseline to follow-up, but the increase was similar in the three groups. The physiologic marker of subclinical atherosclerosis, assessed by aortic stiffness, increased in the transition group alone with no significant change in the premenopausal or postmenopausal women. There was no correlation between theses indices during the follow-up period. Changes in aortic stiffness were more sensitive measures of perimenopausal vascular aging than morphological indices of subclinical atherosclerosis in women undergoing the menopausal transition.
[WG#829]

207 Waetjen LE, Crawford SL, Chang P-Y, Reed B, Hess R, Avis N, Harlow S, Greendale GA, Dugan S, Gold EB. **Factors associated with the development of vaginal dryness symptoms in women transitioning through menopause: a longitudinal study.** Menopause 2018 Oct;25(10):1094-1104. doi: 10.1097/GME.0000000000001130. PMID: 29916947. PMCID: PMC6136974
Primary Question:
Summary of Findings: Vaginal dryness increases from 19.4% among all women at baseline (ages 42-53 years) to 47.0% of women sexually active, and 25.3% of women not sexually active at visit 13 (ages 57-69 years). Advancing menopause, surgical menopause (hysterectomy and removal of ovaries), anxiety and marital status were associated with new reports of vaginal dryness, regardless of sexual activity. For women not using hormone therapy, higher levels of estrogen reduced the risk of developing vaginal dryness, while neither testosterone nor DHEAS levels had no effect on this risk. Although vaginal dryness was not associated with subsequent reporting of pain during intercourse, lubricant use in the year before reports of vaginal dryness was associated with a lower chance of reporting of sexual pain.
[WG#701]

208 Hanley C, Shields KJ, Matthews KA, Brooks MM, Janssen I, Budoff MJ, Sekikawa A,

Mulukutla S, El Khoudary SR **Cardiovascular fat in women at midlife: effects of race, overall adiposity, and central adiposity. The SWAN Cardiovascular Fat Study** Menopause 2018 Jan;25(1):38-45. doi: 10.1097/GME.0000000000000945.
Primary Question:
Summary of Findings: Black women had significantly lower volumes of cardiovascular fat compared with White women, independent of individual measures of adiposity. Race modified the associations between adiposity and cardiovascular fat with stronger associations between BMI and paracardial fat in White women compared with Black women, and stronger associations between abdominal visceral fat and epicardial fat in Black women compared with White women.
[WG#755DissertationHypo1]

209 Zhu D, Chung H-F, Pandeya N, Dobson AJ, Kuh D, Crawford SL, Gold EB, Avis NE, Giles GG, Bruinsma F, Adami H-O, Weiderpass E, Greenwood DC, Cade JE, Mitchell ES, Woods NF, Brunner EJ, Kildevaeld Simonsen M, Mishra GD. **Body mass index and age at natural menopause: an international pooled analysis of 11 prospective studies** Eur J Epidemiol. 2018 Aug;33(8):699-710. doi: 10.1007/s10654-018-0367-y. Epub 2018 Feb 19. PMID 29460096
Primary Question:
Summary of Findings: Current evidence on the association between body mass index (BMI) and age at menopause remains unclear. We
investigated the relationship between BMI and age at menopause using data from 11 prospective studies. A total of 24,196
women who experienced menopause after recruitment was included. Baseline BMI was categorised according to the WHO
criteria. Age at menopause, confirmed by natural cessation of menses for C 12 months, was categorised as\45 years
(early menopause), 45–49, 50–51 (reference category), 52–53, 54–55, and C 56 years (late age at menopause). We used
multinomial logistic regression models to estimate multivariable relative risk ratios (RRRs) and 95% confidence intervals
(CI) for the associations between BMI and age at menopause. The mean (standard deviation) age at menopause was 51.4
(3.3) years, with 2.5% of the women having early and 8.1% late menopause. Compared with those with normal BMI
(18.5–24.9 kg/m2), underweight women were at a higher risk of early menopause (RRR 2.15, 95% CI 1.50–3.06), while
overweight (1.52, 1.31–1.77) and obese women (1.54, 1.18–2.01) were at increased risk of late menopause. Overweight
and obesity were also significantly associated with around 20% increased risk of menopause at ages 52–53 and
54–55 years. We observed no association between underweight and late menopause. The risk of early menopause was
higher among obese women albeit not significant (1.23, 0.89–1.71). Underweight women had over twice the risk of
experiencing early menopause, while overweight and obese women had over 50% higher risk of experiencing late
menopause.
[WG#986PUD]

210 Thurston RC, Karvonen-Gutierrez CA, Derby CA, El Khoudary SR, Kravitz HM, Manson JE. **Menopause versus chronologic aging: their roles in women's health.** Menopause 2018 Aug;25(8):849-854. doi: 10.1097/GME.0000000000001143 PMID: 30045364
Primary Question:
Summary of Findings:
[WG#927]

211 Allshouse AA, Santoro N, Green R, Wong JYY, Upchurch DM, Neal-Perry G, Thurston RC, Derby CA **Religiosity and faith in relation to time to metabolic syndrome for Hispanic women in a multiethnic cohort of women-Findings from the Study of Women's Health Across the Nation (SWAN).** Maturitas 2018 Jun;112:18-23. doi: 10.1016/j.maturitas.2018.03.008. Epub 2018 Mar 13. PMID: 29704912 PMCID: PMC5933058
Primary Question:
Summary of Findings: Faith could be associated with a different risk of MetS among women of Hispanic vs other ethnicities, suggesting that among women not part of a community of faith, Hispanic ethnicity is risk factor for MetS.
[WG#783]

212 Karvonen-Gutierrez CA, Peng Q, Peterson M, Duchowny K, Nan B, Harlow S. **Low grip strength predicts incident diabetes among mid-life women: the Michigan Study of Women's Health Across the Nation.** Age Ageing 2018 Sep 1;47(5):685-691. doi: 10.1093/ageing/afy067. PMID: 29726885 PMCID: PMC6108393
Primary Question:
Summary of Findings: Higher baseline grip strength relative to body weight was associated with lower rates of diabetes.
The association between baseline grip strength and diabetes was stronger in White women compared to Blacks.
Rate of change in grip strength was not associated with diabetes incidence.

[WG#813]

213 Chyu L, Upchurch DM. **A longitudinal analysis of allostatic load among a multi-ethnic sample of midlife women: Findings from the Study of Women Across the Nation.** Women's Health 2018 May - Jun;28(3):258-266. doi: 10.1016/j.whi.2017.11.002. Epub 2017 Dec 8.
Primary Question:
Summary of Findings: Women's allostatic load score increased by approximately 2% each year over the course of the study. African American race/ethnicity, low family income, older age, and ability to read and speak only in English were significantly associated with higher allostatic load.
[WG#394]

214 Hedgeman E, Hasson RE, Karvonen-Gutierrez CA, Herman WH, Harlow SD **Perceived Stress Across the Midlife: Longitudinal Changes Among a Diverse Sample of Women, The Study of Women's Health Across the Nation (SWAN)** Women's Midlife Health 2018 Mar;4(2)

Primary Question:
Summary of Findings: At baseline, Hispanic women, women with less education and women reporting financial hardship were more likely to report high perceived stress levels. After adjustment for sociodemographic factors (age, race / ethnicity, education, financial hardship, site of recruitment), we found that perceived stress decreased over the midlife for most SWAN women, but increased for Hispanic and white women recruited from New Jersey. Changing menopausal status was not a significant predictor of perceived stress after adjustment for these sociodemographic variables.
[WG#791]

215 Kim C, Harlow SD, Zheng H, McConnell DS, Randolph JF **Changes in androstenedione, dehydroepiandrosterone, testosterone, estradiol, and estrone over the menopausal transition** Women's Midlife Health 2017 ; 3: . doi:10.1186/s40695-017-0028-4
Primary Question:
Summary of Findings: A4 and E1 decline minimally over the MT, and A4 and E1 are higher in Whites than in African-Americans.
[WG#679]

216 Waetjen LE, Xing G, Johnson WO, Melnikow J, Gold EB **Factors associated with reasons incontinent midlife women report for not seeking urinary incontinence treatment over 9 years across the menopausal transition.** Menopause 2018 Jan;25(1):29-37. doi: 10.1097/GME.0000000000000943. PMID: 28763399. PMCID PMC5735005
Primary Question:
Summary of Findings: Of the 1339 women reporting urinary incontinence (UI) during follow-up, 814 (61.0%) reported they did not seek treatment for UI. The most frequently reported reasons for not seeking treatment were: UI was not bad enough, the belief that UI is a normal part of aging and that health care providers never asked. Women with more frequent UI were most likely to report beliefs about the cause of UI or motivation barriers as reasons for not seeking treatment regardless of race or ethnicity, socioeconomic status, or education level.
[WG#709A]

217 Cortes Y, Catov J, Brooks MM, Harlow S, Isasi C, Jackson E, Matthews KA, Thurston R, Barinas-Mitchell E. **History of Adverse Pregnancy Outcomes, Blood Pressure, and Subclinical Vascular Measures in Late Midlife: SWAN (Study of Women's Health Across the Nation)** Journal of the American Heart Association doi:10.1161/jaha.117.007138
Primary Question:
Summary of Findings:  Women who report having had a preterm birth, or multiple adverse pregnancy outcomes, have higher systolic blood pressure at late midlife compared with women who report no adverse pregnancy outcomes.
 Black women who report having had a preterm birth have a lower carotid intima-media thickness at late midlife than White women who report having had a preterm birth.
 History of adverse pregnancy outcomes was not related to carotid plaque in late midlife.

[WG#821]

218 Yoshida K, Yu Z,Greendale GA, Ruppert K. Lian Y, Tedeschi S, Lin T, Haneuse S, Glynn R, Hernandez-Dias S, Solomon D. **Effects of Analgesics on Bone Mineral Density: a Longitudinal Analysis of the Prospective SWAN Cohort with Three-group Matching Weights** Pharmacoepidemiol and Drug Safety 2017;1–9. https://doi.org/10.1002/pds.4362
Primary Question:
Summary of Findings: Non-steroidal anti-inflammatory drugs (NSAIDs) users had similar bone mineral density trajectory to the reference medication acetaminophen, suggesting they do not differ. Opioid users, however, showed a more pronounced BMD decline in the fifth year of usage, suggesting potential association with decreased BMD if used persistently.
[WG#810]

219 Marsh WK, Bromberger JT, Crawford SL, Leung K, Kravitz HM, Randolph JF, Joffe H, Soares CN. **Lifelong Estradiol Exposure and Risk of Depressive Symptoms during the Transition to Menopause and Postmenopause** Menopause 2017 Dec;24(12):1351-1359. doi: 10.1097/GME.0000000000000929.
Primary Question:
Summary of Findings: A longer duration from menarche to onset of menopause transition (i.e., duration of estrogen exposure) was significantly associated with a lower risk of depression during the menopausal transition and postmenopause

Longer duration of oral contraceptive use was associated with a lower risk of depression while number of pregnancies and breastfeeding were not significantly associated with depression risk during the menopausal transition and postmenopause

[WG#614]

220 Gabriel K, Karvonen-Gutierrez C, Cauley J, Dugan S, Greene AC, Sternfeld B, Stewart A, Strotmeyer E. **Physical activity trajectories during midlife and subsequent risk of physical functioning decline in late mid-life: The Study of Women's Health Across the Nation (SWAN)** Prev Med Prev Med. 2017 Dec;105:287-294. doi: 10.1016/j.ypmed.2017.10.005. Epub 2017 Oct 5.
Primary Question:
Summary of Findings: Across midlife, five patterns of physical activity appeared including: (1) low physical activity, overtime (26.2% of SWAN participants), (2) middle or moderate physical activity, overtime (23.9%), (3) decreasing physical activity, overtime (22.4%), (4) high physical activity, overtime (14.1%), and (5) increasing physical activity, overtime (13.4%). When compared to the low physical activity, overtime group, physical performance improved by 3.5-9.8%. Differences in physical performance were also noted when the other patterns of physical activity were compared to the increasing physical activity group.
[WG#831]

221 Green RR, Santoro N, Allshouse AA, Neal-Perry G, Derby C **Prevalence of CAM Herbal Remedy use in Hispanic and non-Hispanic White women: Results from the Study of Women's Health Across the Nation** Journal of Alternative and Complementary Medicine 2017 Oct;23(10):805-811
Primary Question:
Summary of Findings: We observed overall high prevalence rates of herbal CAM use in

both Hispanic and Non-Hispanic White women. Hispanic women in particular used more types of herbal remedies, and were less likely to report their use to physicians. Use of herbal remedies was higher among women who reported trouble paying for basics and among those without health insurance.

[WG#760]

222 Wu X, Basu R, Malig, B, Broadwin R, Ebisu K, Gold EB, Qi L, Derby C, Green RS. **Association between Gaseous Air Pollutants and Inflammatory, Hemostatic and Lipid Markers in a Cohort of Midlife Women** Environmental International 107:131-139. doi: 10.1016/j.envint.2017.07.004
Primary Question:
Summary of Findings: Both long- and short-term exposures to ambient gas pollutants increase the potential of forming blood clots, and thus contribute to the greater risk of CVD in midlife women.

[WG#841]

223 Colvin A, Richardson GA, Cyranowski JM, Youk A, Bromberger JT. **The Role of Family History of Depression and the Menopausal Transition in the Development of Major Depression in Midlife Women: Study of Women's Health Across the Nation Mental Health Study (SWAN MHS)** Depression and Anxiety 2017 Sep;34(9):826-835. doi: 10.1002/da.22651
Primary Question:
Summary of Findings: Family history of depression predicts major depression in midlife women independent of the menopausal transition and changes in psychosocial and health profiles. Furthermore, the menopausal transition was associated with major depression only among women without a family history of depression
[WG#632B]

224 Kravitz HM, Janssen I, Bromberger JT, Matthews KA, Hall MH, Joffe H **Sleep Trajectories Before and After the Final Menstrual Period in The Study of Women's Health Across the Nation (SWAN)** Curr Sleep Medicine Rep (2017) 3:235-250
Primary Question:
Summary of Findings: We found (1) 4 distinct sleep trajectories for waking several times across the MT in both naturally and surgically menopausal groups, (2) except for one subgroup with an increasing trajectory, this sleep problems tended to remain stable from pre-FMP/pre-surgery to post-FMP/post-surgery, and (3) trouble falling asleep, early morning awakening, and frequent VMS were strongly associated with problems waking several times that persist through post-menopause.
[WG#644]

225 Santoro N, Crawford SL, El Khoudary SR, Allshouse AA, Burnett-Bowie SA, Finkelstein J, Derby C, Matthews K, Kravitz HM, Harlow SD, Greendale GA, Gold EB, Kazlauskaite R, McConnell D, Neal-Perry G, Pavlovic J, Randolph J, Weiss G, Chen HY, Lasley B **Menstrual Cycle Hormone Changes in Women Traversing Menopause: Study of Women's Health**

Across the Nation J Clin Endocrinol Metab July 2017, 102(7):2218-2229, PMID: PMID: 28368525,
Primary Question:
Summary of Findings: Cycle length and hormone levels remain relatively well preserved among ELA cycles, although the proportion of ELA cycles becomes lower as the FMP approaches. In non-ELA cycles, much more heterogeneity in hormones and cycle lengths is observed.
[WG#818]

226 Jepsen KJ, Kozminski A, Bigelow EM, Schlecht SH, Goulet RW, Harlow SD, Cauley JA, Karvonen-Gutierrez C. **Femoral Neck External Size but not aBMD Predicts Structural and Mass Changes for Women Transitioning Through Menopause** J Bone Miner Res. 2017 Jun;32(6):1218-1228. doi: 10.1002/jbmr.3082
Primary Question:
Summary of Findings: Bone size at baseline (i.e., external size of the femoral neck) was negatively correlated with the amount of change in bone mineral content and bone area over a 14-year period but there was no correlation of baseline bone size and change in bone mineral density. This data suggests that longitudinal changes in bone mineral density are associated with different morphologic changes in different women. In some women (those with narrower bones), there are greater increases in bone area with time but in other women (those with wider bones), there are greater losses in bone mineral content.

[WG#840]

227 Basu, S, Duren W, Evans CR, Burant CF, Michailidis G, Karnovsky A. **Sparse network modeling and Metscape-based visualization methods for the analysis of large-scale metabolomics data** Bioinformatics 2017 May 15;33(10):1545-1553. doi: 10.1093/bioinformatics/btx012.
Primary Question:
Summary of Findings: The manuscript describes new Debiased Sparse Partial Correlation (DSPH) methodology and new data visualization tools for modeling metabomics data. The new tools were used to analyze several data sets including targeted and untargeted metabolomics data from SWAN and to demonstrate the applications of new methodology.
[WG#742A]

228 Putnam, MS, Yu EW., Lin D, Darakananda K, Finkelstein JS, Bouxsein ML **Differences in Trabecular Microstructure between Black and White Women Assessed by Individual Trabecular Segmentation Analysis of HR-pQCT Images.** J Bone Miner Res 2017 May;32(5):1100-1108. doi: 10.1002/jbmr.3060
Primary Question:
Summary of Findings: Black women had more plate-like trabecular morphology and higher axial alignment of trabeculae, whereas white women had more rod-like trabeculae. These differences may contribute to the improved bone strength and lower fracture risk observed in black women.

[WG#601F]

229 Baker JH, Peterson CM, Thornton LM, Brownley KA, Bulik CM, Girdler, SS, Marcus MD, Bromberger JT **Reproductive and Appetite Hormones and Bulimic Symptoms during Midlife.** European Eating Disorders Review 2017 May;25(3):188-194. doi: 10.1002/erv.2510.
Primary Question:
Summary of Findings: We did not find that midlife women at perimenopause experience more eating disorder symptoms than women in premenopause. However, we did observe a significant correlation between the appetite hormone leptin and self-reported binge eating.

[WG#636]

230 Randolph J, Karvonen-Gutierrez C, Park SK, Ruppert K, Thurston R, Zheng H(. **Association between changes in oestradiol and follicle-stimulating hormone levels during the menopausal transition and risk of diabetes** Diabet Med. 2017 Apr;34(4):531-538. doi: 10.1111/dme.13301. Epub 2017 Jan 4. PMID: 27973745 PMCID: PMC5352524
Primary Question:
Summary of Findings: Independent of age, obesity, smoking status, education and study site, women with lower premenopausal E2 levels and a slower rate of FSH change during the early transition had higher risk of developing diabetes in midlife as they transitioned through the menopause. The rate of change in E2 during the menopausal transition and baseline FSH levels and change in FSH in the later menopausal transition do not seem to be associated with diabetes risk.
[WG#568]

231 Appelhans BM, Baylin A, Huang MH, Li H, Janssen I, Kazlauskaite R, Avery EF, Kravitz HM **Beverage Intake and Metabolic Syndrome Risk Over 14 years: The Study of Women's Health Across the Nation** J Acad Nutr Diet 2017 Apr;117(4):554-562. doi: 10.1016/j.jand.2016.10.011. Epub 2016 Dec 6.
Primary Question:
Summary of Findings: Less educated women and African-American women were the highest consumers of energy-dense beverages. Greater consumption of energy-dense beverages was associated with higher odds of developing metabolic syndrome and accumulating additional metabolic syndrome components over time. These associations were primarily driven by risk for hypertension and impaired fasting glucose.
[WG#734]

232 Avis N, Brooks MM, Colvin A, Crawford S, Greendale GA, Hess R, Karlamangla A, Tepper PG, Waetjen E. **Change in Sexual Functioning Over the Menopause Transition: Results from the Study of Women's Health Across the Nation (SWAN)** Menopause 2017 Apr;24(4):379-390. doi: 10.1097/GME.0000000000000770. PMID: 27801705 PMCID: PMC5365345
Primary Question:
Summary of Findings: Decline in sexual function became apparent 20 months prior to FMP and continued to decline more than one year after the FMP, but at a slower rate. Women who had a hysterectomy did not show decline in sexual function prior to hysterectomy, but scores declined afterwards.

[WG#526]

233 Samuelsson LB, Rangarajan AA, Shimada K, Krafty RT, Buysse DJ, Strollo PJ, Kravitz HM, Zheng H, Hall, MH. **Support Vector Machines for Automated Snoring Detection: Proof-of-Concept** Sleep and Breathing 2017 Mar;21(1):119-133. doi: 10.1007/s11325-016-1373-5. Epub 2016 Jul 13. PMID 27411338 PMCID: PMC5903275
Primary Question:
Summary of Findings: Episodes of snoring during sleep can be reliably identified using a computer algorithm. The computer algorithm performs comparably to human visual scorers in the detection of snoring events during sleep.
[WG#740]

234 Jackson EA, Ruppert K, Derby CA,Lian Y, Neal-Perry G, Habel LA, Tepper PG, Harlow SD, Solomon DH. **Effect of Race and Ethnicity on Antihypertensive Medication Utilization among Women in the United States: The Study of Women's Health Across the Nation (SWAN)** J Am Heart Assoc. 2017 Feb 23;6(3). pii: e004758. doi: 10.1161/JAHA.116.004758. PMID: 28232324 PMCID: PMC5524010
Primary Question:
Summary of Findings: Use of antihypertension medications increased over time particularly among White and Black women. The most commonly used class of antihypertensive medication was angiotensin converting enzyme inhibitors or angiotensin receptor blockers. Black women were more likely to report use of calcium channel blockers compared to Whites women. Current guidelines support the use of thiazide diuretics as first line antihypertensive class for most adults; despite increases in thiazide use over time, this class was not the most commonly used antihypertensive medication class.

[WG#649]

235 Sternfeld B, Colvin A, Stewart A, Dugan S, Nackers L, El Khoudary S, Huang MH, Karvonen-Gutierrez C **The Effect of a Healthy Lifestyle on Future Physical Functioning in Midlife Women** Med Sci Sports Exerc. 2017 Feb;49(2):274-282. doi: 10.1249/MSS.0000000000001109. PMID: 27669444. PMCID: PMC5271600
Primary Question:
Summary of Findings: A composite score representing the average values of as many as three repeated measures of diet, physical activity and smoking behavior was associated with faster walking speed, better ability to rise from a seated position, and overall better physical functioning. Most of the association was due to physical activity with smoking behavior and diet playing on insignificant roles.
[WG#729]

236 Pangaja Paramsothy, Sioban D. Harlow, Bin Nan, Gail A. Greendale. Nanette Santoro, Sybil L. Crawford, Ellen B. Gold, Ping G. Tepper, John F. Randolph Jr **Duration of the menopausal transition is longer in women with young age at onset: the multiethnic Study of Women's Health Across the Nation** Menopause 2017 Feb;24(2):142-149. doi: 10.1097/GME.0000000000000736. PMID: 27676632. PMCID: PMC5266650

Primary Question:
Summary of Findings: Women with an earlier age at onset of menopausal transition had a longer duration of the menopausal transition. Smokers were younger at the onset of the menopausal transition and had a shorter duration of the menopausal transition. African-American race were associated with younger onset but longer duration of the MT.
[WG#175]

237 Chandrasekaran N, Harlow S., Moroi S, Musch D, Peng M, Karvonen-Gutierrez C **Visual Impairmentat at baseline is associated with future poor physical functioning among middle-aged women: The Study of Women's Health Across the Nation, Michigan Site** Maturitas 2017 Feb;96:33-38. doi: 10.1016/j.maturitas.2016.11.009. Epub 2016 Nov 15. PMID: 28041592 PMCID: PMC5215835
Primary Question:
Summary of Findings: At the time of the first vision exam, the prevalence of distant visual impairment was 19.3% and of near visual impairment was 39.5% among women in the Michigan site of the Study of Women's Health Across the Nation. Distant visual impairment was predictive of poorer forward reach and timed stair climb up to 10 years later whereas near visual impairment was only predictive of poorer forward reach. Stratified analyses revealed that the association of near visual impairment and forward reach was present only among black women.
[WG#832]

238 Lee YC, Karlamangla AS, Yu Z, Solomon D, Liu CC, Finkelstein JS, Greendale GA, Harlow SD, Solomon DH **Pain Severity in Relation to the Final Menstrual Period in a Prospective Multiethnic Observational Cohort: Results From the Study of Women's Health Across the Nation** Journal of Pain 2017 Feb;18(2):178-187. doi: 10.1016/j.jpain.2016.10.012. Epub 2016 Nov 9. PMID: 27836812. PMCID: PMC5291798
Primary Question:
Summary of Findings: Bodily pain (on a scale of 0-100) increased at a rate of 0.49 points per year during the late reproductive years and menopause transition (10 years before to 0.4 years after the final menstrual period). During early postmenopause (0.4 to 5 years after the final menstrual period), pain decreased at an average rate of 0.82 points per year and plateaued in late postmenopause. Although statistically significant, these changes are unlikely to represent clinically meaningful differences.
[WG#673]

239 Kazlauskaite R, Avery-Mamer EF, Li H, Chataut CP, Janssen I, Powell LH, Kravitz HM **Race/Ethnic Comparisons of Waist-to-Height Ratio for Cardiometabolic Screening: The Study of Women's Health Across the Nation** American Journal of Human Biology 2017 Jan;29(1):10.1002/ajhb.22909. doi: 10.1002/ajhb.22909. Epub 2016 Nov 1. PMID: 27801534 PMCID: PMC5426803
Primary Question:
Summary of Findings: The performance of WHtR to screen for cardiometabolic conditions was fair/good among all 5 race/ethnic groups. In race/ethnicity stratified analyses, the boundary values for waist-to-height ratio to screen for cardiometabolic outcomes suggest the need for higher WHtR boundary values in non-Asian minority women compared to Asian women, and range from 0.45 to 0.55.
The likelihood of overall high cardiometabolic risk decreases by 0.24 if woman's WHtR<0.45

(sensitivity 86%, specificity 55%, negative predictive value 55%); whereas the likelihood of overall high cardiometabolic risk increases 6.6-fold if woman's WHtR>0.55 (sensitivity 53%, specificity 91%, positive predictive value 54%).
Midlife transition is a vulnerable period in women's lives for progression of abdominal adiposity and related cardiometabolic conditions. A simple public health message: "Keep your waist to less than half of your height"1 applies to mid-life women of all ethnicities to alert about preventable cardiometabolic risk.

[WG#97]

240 Karlamangla A, Lachman M, Han WJ, Huang MH, Greendale GA. **Evidence for Cognitive Aging in Midlife Women: Study of Women's Health Across the Nation** PLoS One 2017 Jan 3;12(1):e0169008. doi: 10.1371/journal.pone.0169008. eCollection 2017. PMID: 28045986. PMCID: PMC5207430
Primary Question:
Summary of Findings: Although cross-sectional studies suggest that human cognitive aging starts in midlife, few longitudinal studies have documented within-individual declines in cognitive performance. Using annually repeated measures of cognitive performance, we showed that cognitive aging in women does indeed occur in midlife, with substantial longitudinal declines in cognitive processing speed and verbal memory.
[WG#697]

241 El Khoudary SR, Shields KJ, Janssen I, Budoff MJ, Everson-Rose SA, Powell LH, Matthews KA. **Postmenopausal Women with Greater Paracardial Fat Have More Coronary Artery Calcification than Premenopausal Women: The Study of Women's Health Across the Nation (SWAN) Cardiovascular Fat Ancillary Study** J Am Heart Assoc. 2017 Jan 29;6(2):e004545. doi: 10.1161/JAHA.116.004545. PMID: 28137715 PMCID: PMC5523758
Primary Question:
Summary of Findings: We demonstrated that greater volumes of epicardial fat volumes are significantly associated with presence and extent of coronary calcification, independent of age, race, menopausal status and traditional CVD risk factors. Additionally, we reported that the associations between paracardial fat volumes and CAC measures are significantly modified by women's menopausal status and E2 levels independent of age, race, obesity and other CVD risk factors; while similar effect modifications were not found for epicardial fat volumes as related to CAC measures. Taken together, the current findings suggest PAT as a potential menopause-specific CVD risk factor.

[WG#761]

242 Basu R, Broadwin R, Derby CA, Gold EB, Green S(, Jackson E, Malig BJ, Qi L, Wu X. **Estimating the Associations of Apparent Temperature and Inflammatory, Hemostatic, and Lipid Markers in a Cohort of Midlife Women** Environ Res 2017 Jan;152:322-327.doi: 10.1016/j.envres.2016.10.023. Epub 2016 Nov 9. PMID: 27835857. PMCID: PMC5135618
Primary Question:
Summary of Findings: After taking into account age, race/ethnicity, geographic location, body weight, smoking and recent alcohol use, women exposed to higher and lower levels of apparent temperature over the past week or month had higher levels of some blood markers

of inflammation, blood clotting, and lipid markers than women exposed to lower levels of apparent temperature.

[WG#803]

243 Matthews KA, El Khoudary SR, Brooks MM, Derby CA, Harlow S, Thurston R. **Trajectories of lipids and lipoproteins over the menopausal transition and subclinical measures of vascular disease** Stroke 2017 Jan;48(1):70-76. doi: 10.1161/STROKEAHA.116.014743. Epub 2016 Dec 1. PMID: 27909203. PMCID: PMC5183479
Primary Question:
Summary of Findings: Our findings suggest that declines in HDL-C and increases in LDL-C around the FMP are associated with subsequent adventitial diameter and carotid plaque scores, respectively, in the postmenopausal years. Furthermore, these associations were independent of age, site, race, educational attainment, number of years after the menopause at the time of the carotid scan, baseline systolic blood pressure and BMI, or medications for hypertension or diabetes. Adjustments for baseline HDL-C or LDL-C and for changes in HDL-C or LDL-C prior to and after the one year interval did reduce the effect sizes somewhat but the associations by and large remained. Taken together, the findings suggest that changes in HDL-C and LDL-C around the FMP do provide unique predictive information.
[WG#763]

244 Pastore LM, Young SL, Manichaikul A, Baker VL, Wang XQ, Finkelstein JS **Distribution of the FMR1 gene in females by race/ethnicity: women with diminished ovarian reserve versus women with normal fertility (SWAN Study)** Fertility and Sterility 2017 Jan;107(1):205-211.e1. doi: 10.1016/j.fertnstert.2016.09.032. Epub 2016 Nov 2. PMID: 27816231 PMCID: PMC5261832
Primary Question:
Summary of Findings: This study refutes prior reports of an association between Diminished Ovarian Reserve and CGG trinucleotide repeats of 35-54 CGG length, which would be considered high normal and intermediate in the current FMR1 clinical laboratory reference range. This study confirms an association between Diminished Ovarian Reserve and a very low number of repeats (most notably <20 CGG) in Caucasians, which was reported by one large NY fertility clinic; These repeat lengths would be considered low normal in the current FMR1 clinical laboratory reference ranges.
[WG#749]

245 Gold EB, Crawford SL, Shelton JF, Tepper PG, Crandall CJ, Greendale GA, Matthews KA, Thurston RC, Avis NE **Longitudinal analysis of changes in weight and waist circumference in relation to incident vasomotor symptoms: the Study of Women's Health Across the Nation (SWAN)** Menopause 2017 Jan;24(1):9-26. doi: 10.1097/GME.0000000000000723. PMID: 27749738 PMCID: PMC5177513
Primary Question:
Summary of Findings: Greater concurrent body mass index and WC were significantly positively related to incident VMS in the early menopause stage and negatively related in the late stage of menopause. Percentage weight change since baseline had a shallow U-shaped association with incident frequent (>6 days in the last two weeks) VMS in the early stage and shallow inverse U-shape in the late stage.

[WG#387]

246 Quintana FA, Johnson WO, Waetjen LE, Gold EB. **Bayesian nonparametric longitudinal data analysis** Journal of American Statistical Association, Theory and Methods. 2016;111(515):1168-1181. doi: 10.1080/01621459.2015.1076725. Epub 2016 Oct 18. PMID: 28366967 PMCID: PMC5373670
Primary Question:
Summary of Findings: Here, we develop a novel statistical model that generalizes standard mixed models for longitudinal data that include flexible mean functions as well as combined compound symmetry (CS) and autoregressive (AR) covariance structures. Our model generalizes these types of covariance structure by using Bayesian nonparametric methods. The methodology is illustrated using data on Follicle Stimulating Hormone (FSH) profiles in women who are experiencing the menopausal transition. While our main goal was to accommodate different kinds of potential correlations in the data, we also focus on the estimation of a variety of covariance structures and make comparisons with other methods that have been used in the literature. We observe that models that fail to incorporate CS or AR structure can result in very poor estimation of a of a covariance or correlation matrix. covariance or correlation matrix.
[WG#677]

247 Jackson EA, El Khoudary SR, Crawford SL, Matthews KA, Joffe H, Chae C, Thurston RC **Hot Flash Frequency and Blood Pressure: Data from the Study of Women's Health Across the Nation.** J Womens Health (Larchmt) 2016 Dec;25(12):1204-1209. doi: 10.1089/jwh.2015.5670. Epub 2016 Jul 12. PMID: 27404767 PMCID: PMC5175429
Primary Question:
Summary of Findings: Women with VMS may be more likely to develop HTN compared to women without VMS. Further research related to VMS including frequency of symptoms is warranted.
[WG#322]

248 Bromberger JT, Kravitz HM, Youk A, Schott LL., Joffe H **Patterns of depressive disorders across 13 years and their determinants among midlife women: SWAN mental health study** J Affect Disord 2016 Dec; 206:31-40. doi: 10.1016/j.jad.2016.07.005. Epub 2016 Jul 5. PMID: 27455356. PMCID: PMC5077630
Primary Question:
Summary of Findings: 91 (31%) women had Persistent/recurrent clinical depression, 27 (9%) had one episode of MDD, 35 (12%) experienced minor depression only, 144 (48%) had no depression. Persistent and recurrent depression episodes during midlife are common. Lifetime and recent/current exposures prior to and during the early MT increase risk of a pernicious depression course. In addition to lifetime major or minor depression, upsetting life events and sleep problems posed a greater risk for persistent or recurrent depression than for the other three groups.
[WG#708]

249 Shieh, A, Ishii, S, Greendale GA, Cauley J, Lo JC, Karlamangla AS **Urinary N-telopeptide and Rate of Bone Loss Over the Menopause Transition and Early Postmenopause** J

Bone Miner Res 2016 Nov;31(11):2057-2064. doi: 10.1002/jbmr.2889. Epub 2016 Oct 21. PMID: 27322414 PMCID: PMC5407063
Primary Question:
Summary of Findings: Levels of a marker of bone breakdown in the urine collected during early postmenopause are related to rates of bone loss across and after the menopause transition. This marker of bone breakdown may be useful in identifying women at risk for faster than average bone loss.

[WG#780]

250 Montez JK, Bromberger JT, Harlow SD, Kravitz HM, Matthews KA. **Life Course-Socioeconomic Status and Metabolic Syndrome Among Midlife Women** The Journals of Gerontology Series B: Psychological Sciences and Social Sciences. 2016 Nov;71(6):1097-1107. doi: 10.1093/geronb/gbw014. Epub 2016 Feb 28. PMID: 26926957 PMCID: PMC5067946
Primary Question:
Summary of Findings: Women raised in adverse childhood SES (low-educated and poor parents) were more likely to have/develop metabolic syndrome during midlife than women raised in good childhood SES (high-educated and non-poor parents), regardless of women's own educational attainment.
[WG#756]

251 Hart V, Sturgeon SR, Reich, N, Sievert L, Crawford SL, Gold EB, Avis, NE, Reeves KW **Menopausal vasomotor symptoms and incident breast cancer risk in the Study of Women's Health Across the Nation** Cancer Causes Control 2016 Nov;27(11):1333-1340. doi: 10.1007/s10552-016-0811-9. Epub 2016 Sep 28. PMID: 27680016 PMCID: PMC5353975
Primary Question:
Summary of Findings: Vasomotor symptoms were associated with a 38% reduction in breast cancer risk. Among women who fully transitioned to postmenopause during follow-up, vasomotor symptoms were associated with a 55% reduction in breast cancer risk. Our findings suggest that endogenous sex hormones may play a more limited role in this association than previously hypothesized. Future research is needed to understand the biology underlying this relationship.

[WG#615A]

252 Mishraa G, Chunga H, Pandeyaa N, Dobsona A, Jones L,Avis N, Crawford S, Gold E, Brown D, Sievertf L, Brunnerg E, Cade J, Burley V, Greenwood D, Giles G, Bruinsma F, Goodman A, Hayashi K, Lee J, Mizunuma H, Kuh D, Cooper R, Hardy R, Obermeyer CM, Lee K,, Simonsen MK, Yoshizawa T, Woods NF, MItchell ES, Hamer M, Demakakos P, Sandin S, Adami HO, Weiderpass E, Anderson D **The InterLACE study: Design, data harmonization and characteristics across 20 studies on women's health** Maritus 2016 Oct;92:176-85. doi: 10.1016/j.maturitas.2016.07.021. Epub 2016 Aug 4. PMID: 27621257. PMCID: PMC5378383
Primary Question:
Summary of Findings: Overall, 76% of the women were Caucasian, 22% Japanese, and

other ethnicity (of 300 or more participants) included Hispanic/Latin American (0.2%), Chinese (0.2%), Middle Eastern (0.3%), African/black (0.5%), and Other (1.0%). The median age at baseline was 47 years (Inter-quartile range (IQR): 41-53), and that at the last follow-up was 56 years (IQR: 48-64). Regarding reproductive characteristics, half of the women (49.8%) had their first menstruation (menarche) at 12-13 years of age. The distribution of menopausal status and the prevalence of chronic disease varied considerably among studies. At baseline, most women (57%) were pre- or peri-menopausal, 20% reported a natural menopause (range 0.8-55.6%), and remaining had surgery or were taking hormones. By the end of follow-up, the prevalence of CVD and diabetes were 7.2% (range 0.9-24.6%) and 4.7% (range 1.3-13.2%), respectively.

[WG#754PUD]

253 Wong JYY, Chang PY, Gold EB, Johnson WO, Lee JS **Environmental tobacco smoke and risk of Late-diagnosis incident fibroids in the Study of Women's Health across the Nation (SWAN)** Fertility and Sterility 2016 Oct;106(5):1157-1164doi: 10.1016/j.fertnstert.2016.06.025. Epub 2016 Jul 18. PMID: 27445196. PMCID: PMC5048612.
Primary Question:
Summary of Findings: Having any exposure to secondhand smoke increases the risk of uterine fibroids in midlife women by approximately 30% compared to having no exposure. In women who never smoked cigarettes, the increased risk of fibroids from secondhand smoke is even greater at nearly 50%.

[WG#799]

254 Ping G. Tepper, Maria M. Brooks, John F. Randolph Jr, Sybil L. Crawford, Samar R. El Khoudary, Ellen B. Gold, Bill L. Lasley, Bobby Jones, Hadine Joffe, Rachel Hess, Nancy E. Avis, Sioban Harlow, Daniel S. McConnell, Joyce T. Bromberger, Huiyong Zheng, Kristine Ruppert, Rebecca C. Thurston **Characterizing the trajectories of vasomotor symptoms across menopausal transition** Menopause. 2016 Oct;23(10):1067-74. doi: 10.1097/GME.0000000000000676. PMID: 27404029. PMCID: PMC5028150
Primary Question:
Summary of Findings: Four distinct VMS trajectories were found: early onset and decline after the FMP (early onset, 18.4%), onset near the FMP then decline (late onset, 28.9%), early onset and persistently high (high, 25.5%), and consistently low frequency (low, 27.2%). Relative to women with low levels of VMS across the transition, women with persistently high and early onset VMS had a more adverse psychosocial and health profile and low levels of estradiol, the early onset group was less likely to be obese. The high VMS group was less likely to have a moderate than high rise of FSH. African American women were most likely to be in the late onset or persistently high VMS groups relative to Caucasian women.

[WG#689]

255 El Khoudary SR, Hutchins PM, Matthews KA, Mori Brooks M, Orchard J, Heinecke J **Cholesterol Efflux Capacity and Subclasses of HDL Particles in Healthy Women Transitioning Through Menopause** J Clin Endocrinol Metab 2016 Sep;101(9):3419-28. doi: 10.1210/jc.2016-2144. Epub 2016 Jul 11.PMID: 27399353 PMCID: PMC5010578
Primary Question:
Summary of Findings: Within a median of 2.14 years of menopause, an improvement in HDL cholesterol efflux capacity and significant alterations in HDL-P subclasses were observed. Whether patterns of these alterations differ in late postmenopause and how they relate to atherogenesis are not known. The reported changes in HDL metrics over menopause call for further evaluation of potential risk on CVD after menopause.
[WG#800]

256 Lisa M. Pastore, Ani Manichaikul, Xin Q. Wang, Joel S. Finkelstein **FMR1 CGG Repeats: Reference Levels and Race-Ethnicity In Women With Normal Fertility (Study of Women's Health Across the Nation)** Reproductive Sciences 2016 Sep;23(9):1225-33. doi: 10.1177/1933719116632927. Epub 2016 Feb 22. PMID: 26905421 PMCID: PMC5933164
Primary Question:
Summary of Findings: The distribution of this one particular gene (FMR1) does vary by race-ethnicity in women with normal reproductive histories. This report provides unique detail on the distributions for use by researchers and clinicians.
[WG#741]

257 Ellen B. Gold, Craig Wells, Marianne O'Neill Rasor **The Association of Inflammation with Premenstrual Symptoms** Journal of Women's Health 2016 Sep;25(9):865-74. doi: 10.1089/jwh.2015.5529. Epub 2016 May 2.
Primary Question:
Summary of Findings: Having a hs-CRP level >3 mg/L was significantly positively associated with premenstrual mood symptoms (adjusted odds ratio (aOR)=1.32, 95% Confidence Interval (CI) 1.062-1.642), abdominal cramps/back pain (aOR=1.413, 95% CI 1.099, 1.817), appetite cravings/weight gain/bloating (aOR=1.407, 95% CI 1.046, 1.893) and breast pain (aOR=1.267, 95% CI 1.030, 1.558). Elevated hs-CRP level was not significantly associated with premenstrual headaches or reporting three or more PMSx.
[WG#777]

258 Greendale GA, Wilhalme H, Huang MH, Cauley JA, Karlamangla AS **Prevalent and Incident Vertebral Deformities in Midlife Women: Results from the Study of Women's Health Across the Nation (SWAN)** PLoS One 2016 Sep 22;11(9):e0162664. doi: 10.1371/journal.pone.0162664. eCollection 2016. PMID: 27657693 PMCID: PMC5033403
Primary Question:
Summary of Findings:
[WG#804]

259 Chang PY, Gold EB, Cauley JA, Johnson WO, Karvonen-Gutierrez C, Jackson EA, Ruppert KM, Lee JS **Triglyceride Levels and Fracture Risk in Midlife Women: Study of Women's Health Across the Nation (SWAN)** JCEM 2016 Sep;101(9):3297-305. doi: 10.1210/jc.2016-1366. Epub 2016 Jun 13. PMID: 27294327 PMCID: PMC5010577
Primary Question:
Summary of Findings: Every 100 mg/dL increase in triglyceride levels was associated with

15% increased risk of non-traumatic fracture in midlife women (7% increased risk of non-traumatic fracture for every 50 mg/dL increase in triglyceride level). In diabetic women, the increased risk of non-traumatic fracture was about 50% for every 100 mg/dL increase (23%, every 50 mg/dL increase) in triglyceride level.
[WG#793A]

260 Vikram V, Shanbhogue V, Finkelstein JS., Bouxsein M, Yu E, **Association Between Insulin Resistance and Bone Structure in NonDiabetic Postmenopausal Women** JCEM 2016 Aug;101(8):3114-22. doi: 10.1210/jc.2016-1726. Epub 2016 May 31. PMID: 27243136 PMCID: PMC4971339
Primary Question:
Summary of Findings: In non-diabetic, postmenopausal women, the presence of insulin resistance and hyperinsulinemia was associated with smaller bone size, greater volumetric bone mineral density and favorable bone microarchitecture at weight bearing and non-weight bearing skeletal sites. Further, these associations were independent of body weight suggesting that hyperinsulinemia directly effects bone structure independently of obesity.

[WG#601D]

261 El Khoudary SR, Wang L., Brooks MM, Thurston RC, Matthews KA **Increase HDL-C Level over The Menopausal Transition is Associated with Greater Atherosclerotic Progression** Journal of Clinical Lipidology Jul-Aug 2016;10(4):962-9. doi: 10.1016/j.jacl.2016.04.008. Epub 2016 Apr 26. PMID: 27578129 PMCID: PMC5010007
Primary Question:
Summary of Findings: As women transition through menopause, increases in HDL-C levels are independently associated with greater cIMT progression. Thus, the quality of HDL may be altered over the menopausal transition rendering HDL dysfunctional and not providing the expected cardioprotective effect.
[WG#772]

262 Wang NC, Matthews KA, Barinas-Mitchell EJM, Chang CCH, El Khoudary SR **Inflammatory/Hemostatic Biomarkers and Coronary Artery Calcium Progression in Women at Midlife (from the Study of Women's Health Across the Nation, Heart Study)** American Journal of Cardiology 2016 Aug 1;118(3):311-8. doi: 10.1016/j.amjcard.2016.05.009. Epub 2016 May 14. PMID: 27289291 PMCID: PMC4949081
Primary Question:
Summary of Findings:
[WG#710]

263 Karlamangla A, Crandall C, Greendale GA, Han W, Seeman T., Shieh A, Han W, Miller D, Binkley N **Quantifying the Balance Between Total Bone Formation and Total Bone Resorption: An Index of Net Bone Formation.** J Clin Endocrinol Metab 2016 Jul;101(7):2802-9. doi: 10.1210/jc.2015-4262. Epub 2016 Jun 23. PMID: 27336357 PMCID: PMC4929845
Primary Question:
Summary of Findings: We created a bone balance index from markers of bone formation and bone breakdown. We found that this index could predict current bone strength as well as

the direction and magnitude of future change in bone strength.
[WG#646]

264 Jelena M. Pavlovic, Amanda A. Allshouse, Nanette F. Santoro, Sybil L. Crawford, Rebecca C. Thurston, Genevieve S. Neal-Perry. Richard B. Lipton, Carol A. Derby **Sex hormones in women with and without migraine: Evidence of migraine-specific hormone profiles** Neurology 2016 Jul 5;87(1):49-56. doi: 10.1212/WNL.0000000000002798. Epub 2016 Jun 1. PMID: 2725188 PMCID: PMC4932235
Primary Question:
Summary of Findings: Of the four sex hormones studies (E1C, PDG, FSH and LH), only E1C was found to decline more steeply in women with a history of migraine compared to those without. This finding supports the 'estrogen withdrawal hypothesis' of migraine pathogenesis. The relatively steeper estrogen decline in women with a history of migraine does not distinguish cycles with and without a headache, suggesting that this rapid luteal E1C decline is more a marker of migraine pathophysiology than mediator of headache.

[WG#775]

265 Imke Janssen, Lynda H. Powell, Karen A. Matthews, Mateusz S. Jasielec, Susan A. Everson-Rose **Relation of Persistent Depressive Symptoms to Coronary Artery Calcification in Women Aged 46 to 59 Years** American Journal of Cardiology, 2016 Jun 15;117(12):1884-9. doi: 10.1016/j.amjcard.2016.03.035. Epub 2016 Apr 5. PMID: 27138181 PMCID: PMC4885775
Primary Question:
Summary of Findings: High depressive symptoms over five years were common (11% experienced three or more episodes), and coronary calcium was low (54% had no CAC, 25% had scores between 0 and 10, and 21% had CAC¡Ý10 Agatston score). Women with 3 or more episodes were twice as likely to have significant CAC (¡Ý10 Agatston units) than women with no depressive episodes [OR (95% CI)=2.20 (1.13-4.28), p=0.020] with no difference by race. Women with 1 or 2 episodes did not differ from women with no episodes.

[WG#607]

266 Mitro SD, Harlow SD, Randolph JF, Reed BD **Chronic vulvar pain in a cohort of post-menopausal women: Atrophy or Vulvodynia?** Women's Midlife Health (2016) 2:4pii: 4. doi: 10.1186/s40695-016-0017-z. Epub 2016 Jun 9. PMID: 28127441.
Primary Question:
Summary of Findings: Some women experience chronic vulvar pain symptoms independent of current estrogen levels, and even while taking hormone replacement. Vulvar atrophy and estrogen deprivation may not be the sole cause of postmenopausal vulvar pain.

[WG#766]

267 Solomon DH, Ruppert K. Greendale GA, Lian Y, Selzer F, Finkelstein JS **Medication Use by Race and Ethnicity in Women Transitioning Through the Menopause: A SWAN Drug Epidemiology Study** J. Womens Health 2016 Jun;25(6):599-605. doi: 10.1089/jwh.2015.5338. Epub 2016 Mar 30. PMID: 27028503 PMCID: PMC4900213
Primary Question:
Summary of Findings: 1. Medication use increases a lot in about 15% of women and very minimally in the rest
2. Menopause has no effect on the increase in medications observed
3. Race/ethnicity play significant roles in medication use

[WG#639]

268 Wang NC., Mathews KA, Barinas-Mitchell EJ, Chang CC, El Khoudary SR **Inflammatory/hemostatic biomarkers and coronary artery calcification in midlife women of African-American and White race/ethnicity: the Study of Women's Health Across the Nation (SWAN) heart study** Menopause 2016 Jun;23(6):653-61. doi: 10.1097/GME.0000000000000605. PMID: 27023861 PMCID: PMC5370572
Primary Question:
Summary of Findings: Plasminogen-activator inhibitor 1, which regulates blood clotting, is related to the change in time of calcium in heart arteries in African-American and Caucasian women.
[WG#710C]

269 Ylitalo KR, Karvonen-Gutierrez C, McClure C, El Khoudary SR, Jackson EA, Sternfeld B, Harlow SD. **Is self-reported physical functioning associated with incident cardiometabolic abnormalities or the metabolic syndrome?** Diabetes Metabolism Research and Reviews 2016 May;32(4):413-20. doi: 10.1002/dmrr.2765. Epub 2015 Dec 10. PMID: 26518120 PMCID: PMC4838533
Primary Question:
Summary of Findings: Substantial limitations in physical functioning predict incident metabolic syndrome. Compared to women who reported no limitations, women who reported some and substantial limitations were more likely to develop hypertension and increased waist circumference. Compared to Caucasian women, African American women were more likely to have elevated fasting glucose, elevated blood pressure, increased waist circumference, and reduced HDL-C, but they were less likely to have elevated triglycerides.
[WG#655]

270 Shahabi L, Karavolos K, Everson-Rose S, Lewis T, Matthews K, Sutton-Tyrrell K, Powell L. **Associations Of Psychological Well-Being with Carotid Intima Media Thickness In African American And White Middle-Aged Women** Psychosomatic Medicine 2016 May;78(4):511-9. doi: 10.1097/PSY.0000000000000293. Epub 2016 Jan 9. PMID: 26761714. PMCID: PMC4851588
Primary Question:
Summary of Findings: Life satisfaction showed a significant, independent, inverse relationship with IMT, after controlling for important demographic, behavioral, and cardiovascular covariates, such that each 1-point higher life satisfaction score predicted a significant 0.010 mm lower level of mean IMT. In contrast, life engagement was not a significant correlate of IMT, and because reported life events were low in this sample, no

significant association was seen between life events and IMT. Finally, no significant interaction between life satisfaction and race on IMT was observed.

[WG#251]

271 El Khoudary SR, Santoro N, Chen HY, Tepper PG, Brooks MM, Thurston RC, Janssen I, Harlow SD, Barinas-Mitchell E, Selzer F, Derby CA, Jackson EA, McConnell D, Matthews KA **Trajectories of estradiol and follicle stimulating hormone over the menopausal transition and early markers of atherosclerosis after menopause** European Journal of Preventive Cardiology 2016 May;23(7):694-703. doi: 10.1177/2047487315607044. Epub 2015 Sep 18. PMID: 26385249 PMCID: PMC4816655
Primary Question:
Summary of Findings: Women with higher E2 before their FMP, but lower E2 afterwards appeared to have lower risk of atherosclerosis after menopause when compared to women with low E2 before and after their FMP. Women with lower FSH rise over MT had lower IMT than those with a medium or high rise.
[WG#721]

272 April M. Falconi, Ellen B. Gold, Imke Janssen **The Longitudinal Relation of Stress during the Menopausal Transition to Fibrinogen Concentrations: Results from the Study of Women's Health Across the Nation** Menopause 2016 May;23:518-27.doi: 10.1097/GME.0000000000000579. PMID: 26886885. PMCID: PMC4844901.
Primary Question:
Summary of Findings: Although perimenopausal women reported perceiving higher levels of stress relative to pre-menopausal women, this increased perception of stress did not translate to significant differences in fibrinogen by stage of the menopausal transition. While perimenopause may represent a sensitive window with respect to the perception of stress, neuroendocrine changes that occur during perimenopause do not appear to exacerbate or interact with such stress, as measured by changes in fibrinogen.

[WG#753]

273 Karvonen-Gutierrez C, Barinas-Mitchell E, Brooks MM, Derby C, Duan C, El Khoudary S, Harlow S, Jackson E, Lewis T, Matthews KA, Thurston R, Zheng H(. **Higher Leptin and Adiponectin Concentrations Predict Poorer Performance-based Physical Functioning in Midlife Women: the Michigan Study of Women's Health Across the Nation.** Journal of Gerontology: Medical Sciences 2016 Apr;71(4):508-14. doi: 10.1093/gerona/glv123. Epub 2015 Aug 24. PMID: 26302979 PMCID: PMC5014187
Primary Question:
Summary of Findings: Higher levels of leptin were associated with poorer mobility physical functioning performance. Higher levels of adiponectin were associated with lower leg strength. Resistin was not associated with any of the physical functioning performance measures.

[WG#684]

274 Karen A. Matthews, Yuefang Chang, Joyce T. Bromberger, Carrie A. Karvonen-Gutierrez, Howard M. Kravitz, Rebecca C. Thurston, Jennifer Karas Montez **Childhood Socioeconomic Circumstances, Inflammation, and Hemostasis Among Midlife Women: Study of Women's Health Across the Nation** Psychosomatic Medicine 2016 Apr;78(3):311-8. doi: 10.1097/PSY.0000000000000283. PMID: 26716815 PMCID: PMC4844772
Primary Question:
Summary of Findings: Women classified as being raised by poor families with parents with little education are likely to have elevated levels of C reactive protein, a generic inflammatory marker, and plasminogen activator inhibitor-1, an inhibitor of fibrinolysis. These relationships are due primarily to women from such families being obese as adults.
[WG#773]

275 Peterson LM, Matthews KA, Derby CA, Bromberger JT, Thurston RC **The Relationship Between Cumulative Unfair Treatment and Intima Media Thickness and Adventitial Diameter: The Moderating Role of Race in the Study of Women's Health Across the Nation** Health Psychology 2016 Apr;35(4):313-21. doi: 10.1037/hea0000288. PMID: 27018722. PMCID: PMC4817355
Primary Question:
Summary of Findings: Cumulative unfair treatment is related to intima media thickness and adventitial diameter. This relationship was moderated by race because unfair treatment was significantly related to higher intima media thickness and adventitial diameter among Caucasian women, and was not significantly related among African American, Hispanic, and Chinese women.
[WG#707]

276 Green S, Broadwin R, Malig B, Basu R, Gold EB, Lihong Q, Sternfeld B, Bromberger JT, Greendale GA, Kravitz H, Tomey K, Matthews K, Derby CA, Jackson EA, Green R, Ostro B. **Long-and Short- Term Exposure To Air Pollution and Inflammatory/Hemostatic Markers in Midlife Women** Epidemiolgy 2016 Mar;27(2):211-20, doi:10.1097/EDE.0000000000000421 PMID: 26600256 PMCID: PMC4841679
Primary Question:
Summary of Findings: After taking into account age, race/ethnicity, geographic location, body weight, smoking and recent alcohol use, women exposed to higher levels of fine particulate matter over the past year had higher levels of some blood markers of inflammation and blood clotting than women exposed to lower levels of pollution. Women who were exposed to higher levels of ozone during the past year had higher levels of a factor associated with blood clotting than women exposed to lower levels. Taking into account menopausal status and other lifestyle and health factors did not change the results.

[WG#618]

277 D.H. Solomon, K, Ruppert, Z, Zhao, Y.J. Lian, G.A. Greendale, J.S. Finkelstein **Bone Mineral Density Changes Among Women Initiating Blood Pressure Lowering Drugs: A SWAN Cohort Study** Osteoporosis International 2016 Mar;27(3):1181-1189. doi:10.1007/s00198-015-3332-6. Epub 2015 Oct 8. PMID: 26449354 PMCID: PMC4813302
Primary Question:
Summary of Findings: Neither ACE inhibitors nor beta blockers were associated with

improvements in bone mineral density (BMD). Thiazide diuretic use was associated with less annualized loss of BMD compared with non-users, as well as compared with ACE inhibitors and beta blockers.
[WG#638E]

278 Taylor BJ, Matthews KA, Hasler BP, Roecklein KA, Kline CE, Buysse D, Kravitz HM, Tiani AG, Harlow SD, Hall MH. **Bedtime Variability and Metabolic Health in Midlife Women: The SWAN Sleep Study** Sleep 2016 Feb 1;39(2):457-65. doi: 10.5665/sleep.5464. PMID: 27091639 PMCID: PMC4712396
Primary Question:
Summary of Findings: Day-to-day variability in bedtime and staying up late, past one's bedtime was associated with greater insulin resistance in mid-life women. Average bedtime was unrelated to metabolic health and no aspect of sleep timing predicted metabolic health five years later.
[WG#743]

279 Jason Y.Y. Wong, Ellen B. Gold, Wesley O. Johnson, Jennifer S. Lee **Circulating Sex Hormones and Risk of Uterine Fibroids: Study of Women's Health Across the Nation (SWAN)** Journal of Clinical Endocrinology & Metabolism 2016 Jan;101(1):123-30. doi: 10.1210/jc.2015-2935. Epub 2015 Dec 15 PMID: 26670127 PMCID: PMC4701845
Primary Question:
Summary of Findings: Increased levels of circulating estradiol and testosterone are individually related to increased risk of uterine fibroids. They also act in synergy to increase the risk of fibroids more than each hormone alone.
[WG#782]

280 Thurston RC, El Khoudary SR, Tepper PG, Jackson EA, Joffe H, Chen HY, Matthews KA. **Trajectories of vasomotor symptoms and carotid intima media thickness in the Study of Women's Health Across the Nation** Stroke 2016 Jan;47(1):12-7. doi: 10.1161/STROKEAHA.115.010600. Epub 2015 Nov 17. PMID:26578657 PMCID: PMC4696910
Primary Question:
Summary of Findings: Women with VMS beginning a decade prior to the FMP and declining several years after the FMP had higher mean and maximal IMT than those with consistently low VMS. These associations were not accounted for by demographic factors nor by CVD risk factors.
[WG#688]

281 Nagaraj N, Matthews KA, Shields KJ, Barinas-Mitchell E, Budoff MJ, El Khoudary SR **Complement Proteins and Arterial Calcification in Middle Aged Women: Cross-sectional Effect of Cardiovascular Fat. The SWAN Cardiovascular Fat Ancillary Study** Atherosclerosis. 2015 Dec;243(2):533-9. doi: 10.1016/j.atherosclerosis.2015.10.095. Epub 2015 Oct 24. PMID: 26523990 PMCID: PMC4817718
Primary Question:
Summary of Findings:
[WG#774]

282 Kazlauskaite R, Innola P, Karavolos K, Dugan SA, Avery EF, Fattout Y, Karvonen-Gutierrez C, Janssen I, Powell LH. **Abdominal Adiposity Change in White and Black Midlife Women: The Study of Women's Health Across the Nation** Obesity 2015 Dec;23(12):2340-3. doi: 10.1002/oby.21350. Epub 2015 Nov 2. PMID: 26523609 PMCID: PMC4704864
Primary Question:
Summary of Findings: No difference was found in the longitudinal intra-abdominal adipose tissue change among black and white midlife women.
[WG#730]

283 Nackers LM, Appelhans BM, Segawa E., Janssen I, Dugan SA, Kravitz HM **Associations Between Body Mass Index and Sexual Functioning in Midlife Women: The Study of Women's Health Across the Nation.** Menopause 2015 Nov;22(11):1175-81. doi: 10.1097/GME.0000000000000452. PMID: 25803669 PMCID: PMC4580485
Primary Question:
Summary of Findings: At baseline, higher BMI was associated with lower intercourse frequency. While overall change in BMI was not associated with changes in sexual functioning over time, during years of greater-than-expected weight gain, sexual desire and intercourse frequency were diminished.
[WG#727]

284 Hall MH, Casement MD, Troxel WM, Matthews KA, Bromberger J, Kravitz HM, Krafty RT, Buysse DJ. **Chronic Stress is Prospectively Associated with Sleep in Midlife Women: The SWAN Sleep Study** Sleep Sleep. 2015 Oct 1;38(10):1645-54. PMID: 26039965
Primary Question:
Summary of Findings: Midlife women who experienced chronic stress over a three- to nine-year period reported more subjective sleep complaints and had more objective difficulty staying asleep compared to women who reported moderate to mild levels of stress. The relationship between chronic stress and sleep was observed even after accounting for the effects of other factors that might disrupt sleep in midlife women including sociodemographics, health characteristics, symptoms of depression and other acute stressful events.
[WG#465]

285 El Khoudary SR, Barinas-Mitchell EJ, Everson-Rose SA, Hanley C, Janssen I, Matthews KA, Powell LH., Budoff M, Shields K **Cardiovascular Fat, Menopause, and Sex Hormones in Women: The SWAN Cardiovascular Fat Ancillary Study** Journal of Clinical Endocrinology & Metabolism 2015 Sep;100(9):3304-12. doi: 10.1210/JC.2015-2110. Epub 2015 Jul 15.PMID: 26176800 PMCID: PMC4570161
Primary Question:
Summary of Findings: Late peri-/postmenopausal women have greater volumes of heart fat depots compared with pre-/early peri-menopausal women independent of age, obesity and other covariates. Endogenous sex hormones are associated with volumes of cardiovascular fat in a pattern suggesting that certain hormones may be more related to a specific location of cardiovascular fat than other hormones. Perhaps cardiovascular fat plays a role in the higher risk of CHD reported in women after menopause.
[WG#762]

286 Kravitz HM, Zheng H, Bromberger JT, Buysse DJ, Owens J, Hall M. **An Actigraphy Study of Sleep and Pain in Midlife Women: The Study of Women's Health Across the Nation Sleep Study.** Menopause 2015 Jul;22(7):710-8. doi: 10.1097/GME.0000000000000379. PMID 25706182 PMCID: PMC4481159
Primary Question:
Summary of Findings: Higher levels of self-reported pain were associated with more actigraphy-assessed sleep disturbance. In particular, more pain was associated with worse sleep continuity including more nighttime body motion and activity (greater movement and fragmentation index and mean activity score), more time spent awake, and a lower percentage of time in bed spent asleep (lower sleep efficiency), as well as more night-to-night variability in these sleep measures.
[WG#517]

287 Bromberger JT, Schott L, Kravitz HM, Joffe H. **Risk Factors for Major Depression during Midlife Among a Community Sample of Women With and Without Prior Major Depression: Are they the Same or Different?** Psychol Med 2015 Jun;45(8):1653-64. Epub 2014 Nov 24. PMID: 25417760 PMCID: PMC4414245
Primary Question:
Summary of Findings: We observed that a large number of women developed an episode of major depression during midlife. Women with a first lifetime episode of major depression during midlife were more likely to have higher trait anxiety, at least one lifetime medical condition, and to report low functioning due to physical problems during the study. For women with a history of major depression, being more internally focused or ruminative, having a history of an anxiety disorder, higher recent depression symptoms, and being peri- or post-menopause increased the risk for a major depression episode during the study, while older age decreased the risk. For both groups, having 6 or more close friends at study entry reduced the risk of a major depression episode during midlife.

[WG#637]

288 Upchurch DM, Stein J, Greendale GA, Chyu L, Tseng CH, Huang MH, Lewis TT, Kravitz HM, Seeman T. **A Longitudinal Investigation of Race, Socioeconomic Status, and Psychosocial Mediators of Allostatic Load in Midlife Women: Findings from the Study of Women's Health Across the Nation.** Psychosomatic Medicine. 2015 May;77(4):402-12. doi: 10.1097/PSY.0000000000000175. PMID: 25886828 PMCID: PMC4431938
Primary Question:
Summary of Findings: Higher discrimination and hostility were predictive of higher AL level. Higher perceived stress were predictive of a faster rate of increase in AL. Racial and SES differences were present, with African American race, lower income, and lower education predictive of higher AL. In addition, the results identified several significant pathways through which race and SES indirectly predict level and change of AL over time.
[WG#661]

289 Cauley JA, Greendale GA, Ruppert K, Lian Y, Randolph JF Jr, Lo JC, Burnett- Bowie SA, Finkelstein JS. **Serum 25 Hydroxyvitamin D, Bone Mineral Density and Fracture Risk Across the Menopause** J Clin Endocrinol Metab 2015 May;100(5):2046-54. doi: 10.1210/jc.2014-4367. Epub 2015 Feb 26. PMID: 25719933 PMCID: PMC4422899

Primary Question:
Summary of Findings: Mid-life women with higher 25(OH)D levels have a lower risk of subsequent non-traumatic fracture. Vitamin D supplementation is warranted in midlife women with 25(OH)D <20 ng/mL.
[WG#717]

290 Avis NE, Crawford SL, Greendale G, Bromberger JT, Everson-Rose SA, Gold EB, Hess R, Joffe H, Kravitz HM, Tepper PG, Thurston RC. **Duration of Menopausal Vasomotor Symptoms Over the Menopausal Transition.** JAMA Intern Med 2015 Apr;175(4):531-9. doi: 10.1001/jamainternmed.2014.8063. PMID:25686030 PMCID: PMC4433164
Primary Question:
Summary of Findings: The median total duration (in years) of frequent vasomotor symptoms was 7.4 years. Frequent VMS persisted after the final menstrual period for about 4.5 years. The primary factor related to duration was when a woman began having frequent symptoms; those women who began experiencing symptoms had a longer duration.
[WG#576]

291 Rothenberger SD, Krafty RT, Taylor BJ, Cribbet MR, Thayer JF, Buysse DJ, Kravitz HM, Buysse ED, Hall MH. **Time-varying Correlations between Delta EEG Power and Heart Rate Variability in Midlife Women: The SWAN Sleep Study.** Psychophysiology 2015 Apr;52(4):572-84. doi: 10.1111/psyp.12383. Epub 2014 Nov 28. PMID: 25431173 PMCID: PMC4376638
Primary Question:
Summary of Findings: Our major finding is that, while whole-night correlations between restorative slow wave sleep and nocturnal parasympathetic activity were strongly and positively correlated in midlife women, the dynamics of this relationship varied within and across Non-REM sleep periods. Additionally, the dynamics of this relationship differed as a function of sleep-disordered breathing and self-reported symptoms of insomnia.
[WG#678]

292 Mori T,Greendale GA, Ishii S, Cauley J, Ruppert K, Crandall C, Karlamangla A, **Parity, Lactation, Bone Strength, and 16-year Fracture Risk in Adult Women: Findings From the Study of Women's Health Across the Nation (SWAN).** Bone. 2015 Apr;73:160-6. doi: 10.1016/j.bone.2014.12.013. Epub 2014 Dec 18. PMID: 25528102 PMCID: PMC4364696
Primary Question:
Summary of Findings: Childbirth or breastfeeding is not, or minimally if any, associated with lower bone strength, and is not associated with fracture risk in later life.
[WG#712]

293 Burns JW, Quartana PJ, Bruehl S, Janssen I, Dugan SA, Appelhans B, Matthews KA, Kravitz HM. **Chronic Pain, Body Mass Index and Cardiovascular Disease Risk Factors: Tests of Moderation, Unique and Shared Relationships in the Study of Women's Health Across the Nation (SWAN).** J Behav Med J Behav Med. 2015 Apr;38(2):372-83. doi: 10.1007/s10865-014-9608-z. Epub 2014 Nov 27. PMID: 25427423 PMCID: PMC4496954
Primary Question:
Summary of Findings: Persistent pain is related to CVD risk factors, and these effects may occur partly through effects of low physical activity.
[WG#589A]

294 Waetjen LE, Xing G, Johnson WO, Melnikow J, Gold EB. **Factors Associated with Seeking Treatment for Urinary Incontinence During the Menopausal Transition.** Obstetrics & Gynecology 2015 May;125(5):1071-9. doi: 10.1097/AOG.0000000000000808. PMID:25932834 PMCID: PMC4346306
Primary Question:
Summary of Findings: We found no clear evidence of racial, socioeconomic or education level disparities in treatment seeking for UI or differences in UI change characteristics for which women reported seeking treatment for UI. Rather, duration of UI symptoms, at least weekly UI just before seeking treatment and worsening of UI symptoms over time had the strongest association with UI treatment-seeking behavior.
[WG#709]

295 Makboon K, Gold EB, Harvey DJ, Butler LM, Habel LA. **Association between high-sensitivity C-Reactive Protein (hsCRP) and Change in Mammographic Density over Time in the SWAN Mammographic Density Subcohort.** Cancer Causes Control 2015 Mar;26(3):431-42. doi: 10.1007/s10552-015-0522-7. Epub 2015 Jan 21. PMID: 25604866 PMCID: PMC4465075
Primary Question:
Summary of Findings: Inflammation results in slower a decline in mammographic density
[WG#528A]

296 El Khoudary SR, Chen H, Barinas-Mitchell E, McClure C, Selzer F, Karvonen-Gutierrez C, Jackson EA, Ylitalo KR, Sternfeld B. **Simple Physical Performance Measures and Vascular Health in Late Midlife Women: The Study of Women's Health Across the Nation.** International Journal of Cardiology. 2015 Mar 1;182:115-20. doi: 10.1016/j.ijcard.2014.12.042. Epub 2014 Dec 23. PMID: 25577747 PMCID: PMC4382424
Primary Question:
Summary of Findings: The current data suggest that poor performance in simple non-invasive objective physical functioning tests, such as walking speed, may be an early indicator of structural changes in vascular health at late midlife.
[WG#692]

297 Allshouse AA, Polotsky A, Crawford S, Chen HY, El Khoudary SR, Santoro N. **Consistent Ovulation May Not Be Enough to Make Women Healthy when Approaching Menopause: An Update from the Study of Women's Health Across the Nation.** Menopause. 2015 Mar;22(3):267-74. doi: 10.1097/GME.0000000000000314. PMID: 25714237 PMCID: PMC4341112
Primary Question:
Summary of Findings: Women who were consistently ovulatory were not significantly better on cardiometabolic metrics, and were worse off in HDL prior to menopause.
[WG#610]

298 Greendale GA, Tseng CH, Han W, Huang MH, Leung K, Crawford S, Gold EB, Waetjen LE, Karlamangla AS. **Dietary Isoflavones and Bone Mineral Density During Midlife and the Menopausal Transition: Cross-sectional and Longitudinal Results from the SWAN Phytoestrogen Study.** Menopause 2015 Mar;22(3):279-88. doi:

10.1097/GME.0000000000000305. PMID: 25116050 PMCID: PMC4324399
Primary Question:
Summary of Findings: In Japanese women, high isoflavone intake was associated with higher maximum adult bone mass but a greater rate of lumbar spine bone loss during the menopause transition. Isoflavone intake was not related to maximum adult bone mass or menopause-related bone loss in African American, Caucasian or Chinese women.
[WG#645]

299 Prairie BA, Wisniewski SR, Luther J, Hess R, Thurston RC, Wisner KL, Bromberger JT. **Symptoms of Depressed Mood, Disturbed Sleep and Sexual Problems in Midlife Women: Cross-sectional Data from the Study of Women's Health Across the Nation.** J Womens Health 2015 Feb;24(2):119-26. doi: 10.1089/jwh.2014.4798. Epub 2015 Jan 26. PMID: 25621768 PMCID: PMC4326025
Primary Question:
Summary of Findings: In this cross-sectional analysis of the SWAN cohort, 5% of women were affected by the complex of symptoms of depressed mood, disturbed sleep and sexual problems. Women with poor social support and more stressful life events, as well as women who were surgically menopausal, had the highest risk of having this symptoms complex.
[WG#536]

300 Dugan SA, Bromberger JT, Segawa E, Avery E, Sternfeld B. **Association between Physical Activity and Depressive Symptoms: Midlife Women in SWAN.** Medicine and Science in Sports and Exercise. 2015 Feb;47(2):335-42. doi: 10.1249/MSS.0000000000000407. PMID: 24914519 PMCID: PMC4280341
Primary Question:
Summary of Findings: Higher physical activity levels were associated with lower levels of depressive symptoms over ten years independent of potential confounders. Our findings suggest that maintaining moderate intensity PA levels during midlife may be protective against depressive symptoms
[WG#267/525]

301 Janssen I, Powell LH, Jasielec MS, Kazlauskaite R. **Covariation of Change in Bioavailable Testosterone and Adiposity in Midlife Women.** Obesity 2015 Feb;23(2):488-94. doi: 10.1002/oby.20974. Epub 2014 Dec 31. PMID: 25557490 PMCID: PMC4310763
Primary Question:
Summary of Findings: An annual increase in VAT of about 3.5% was observed independently of age and known cardiovascular risk factors. This change in VAT was significantly related to the change in bioavailable testosterone.
[WG#463]

302 Appelhans BM, Segawa E, Janssen I, Nackers LM, Kazlauskaite R, Baylin A, Burns JW, Powell LH, Kravitz HM. **Meal Preparation and Cleanup Time and Cardiometabolic Risk over 14 Years in the Study of Women's Health Across the Nation (SWAN).** Prev Med 2015 Feb;71:1-6. doi: 10.1016/j.ypmed.2014.11.025. Epub 2014 Dec 6. PMID: 25490602 PMCID: PMC4329067
Primary Question:
Summary of Findings: Contrary to expectations, greater time spent preparing meals was associated with developing an adverse cardiometabolic profile.

[WG#728]

303 Paramsothy P, Harlow SD, Elliott MR, Yosef M, Lisabeth LD, Greendale GA, Gold EB, Crawford SL, Randolph JF. **Influence of Race/ethnicity, Body Mass Index, and Proximity of Menopause on Menstrual Cycle Patterns in the Menopausal Transition: the Study of Women's Health Across the Nation.** Menopause 2015 Feb;22(2):159-65. doi: 10.1097/GME.0000000000000293. PMID: 25026113 PMCID: PMC4295005
Primary Question:
Summary of Findings: As women progressed through the MT and increased frequency of long menstrual cycles is seen. Chinese and Japanese women had longer menstrual cycles compared to Caucasian women. Obese women had longer menstrual cycles as compared to non-obese women. These associations remained after adjustment for smoking, education, physical activity, and time.
[WG#188C]

304 Yu EW, Putman MS, Derrico N, Abrishamanian-Garcia G, Finkelstein JS, Bouxsein ML. **Defects in Cortical Microarchitecture among African-American women with Type 2 Diabetes.** Osteoporosis International 2015 Feb;26(2):673-9. doi: 10.1007/s00198-014-2927-7. Epub 2014 Nov 15. PMID: 25398431 PMCID: PMC4400116
Primary Question:
Summary of Findings:
[WG#601B]

305 Solomon DH, Diem SJ, Ruppert K, Lian Y, Liu C, Wohlfart A, Greendale GA, Finkelstein JS. **Bone Mineral Density Changes Among Women Initiating Proton Pump Inhibitors or H2 Receptor Antagonists: a SWAN Cohort Study.** J Bone Miner Res 2015 Feb;30(2):232-9. doi: 10.1002/jbmr.2344. PMID: 25156141 PMCID: PMC4404624
Primary Question:
Summary of Findings: Women initiating use of a PPI or H2RA did not have higher rates of subsequent bone loss at the spine, total hip, or femoral neck than women not initiating use of these medications. However, in a positive control analysis, we found that women initiating hormone therapy did have improved bone mineral density compared with those who did not.
[WG#638A]

306 Zheng H, Harlow SD, Kravitz HM, Bromberger J, Buysse DJ, Matthews KA, Gold EB, Owens JF, Hall M. **Actigraphy-defined Measures of Sleep and Movement Across the Menstrual Cycle in Midlife Menstruating Women: Study of Women's Health Across the Nation Sleep Study.** Menopause. 2015 Jan;22(1):66-74. doi: 10.1097/GME.0000000000000249. PMID: 24845393 PMCID: PMC4237700
Primary Question:
Summary of Findings: Sleep efficiency declined gradually across the menstrual cycle, but the decline became pronounced in Segment 4 which represents the premenstrual period. The association of segment with sleep efficiency or minutes of total sleep time was modified by sociodemographic factors and personal behaviors, including smoking.
[WG#485]

307 Tomey K, Greendale GA, Kravitz HM, Bromberger JT, Burns JW, Dugan SA, de Leon CF.

Association Between Aspects of Pain and Cognitive Performance and the Contribution of Depressive Symptoms in Mid-Life Women: A Cross-Sectional Analysis. Maturitas. 2015 Jan;80(1):106-12. doi: 10.1016/j.maturitas.2014.10.013. Epub 2014 Nov 3. PMID: 25466300 PMCID: PMC4272662
Primary Question:
Summary of Findings: Greater pain experiences that interfered with daily functioning were independently associated with poorer cognitive function, and this association was partly mediated by depressive symptoms. Additionally, an independent association between a greater combined pain score and poorer cognitive function was identified, but was mediated by depressive symptoms and had only an indirect effect.
[WG#613]

308 Randolph JF Jr, Zheng H, Avis NE, Greendale GA, Harlow SD. **Masturbation Frequency and Sexual Function Domains are Associated with Serum Reproductive Hormone Levels across the Menopausal Transition.** J Clin Endocrinol Metab 2015 Jan;100(1):258-66. doi: 10.1210/jc.2014-1725. PMID: 25412335 PMCID: PMC4283018
Primary Question:
Summary of Findings: MASTURBATION, SEXUAL DESIRE AND AROUSAL WERE POSITIVELY ASSOCIATED WITH T. MASTURBATION, AROUSAL AND ORGASM WERE NEGATIVELY ASSOCIATED WITH FSH. ASSOCIATIONS WERE MODEST. ESTRADIOL WAS NOT RELATED TO ANY MEASURED SEXUAL FUNCTION DOMAIN. PAIN WITH INTERCOURSE WAS NOT ASSOCIATED WITH ANY HORMONE.

[WG#323/103C]

309 Kim C, Harlow S, Karvonen-Gutierrez C, Nan B, Ylitalo K. **Reproductive History and Chronic Hepatic Steatosis in the Michigan Study of Women's Health Across the Nation.** J Womens Health 2015 Jan;24(1):42-8. doi: 10.1089/jwh.2014.4839. Epub 2014 Dec 30. PMID: 25548857 PMCID: PMC4303017
Primary Question:
Summary of Findings:
[WG#687]

310 Brown C, Bromberger JT, Schott LL, Crawford, S, Matthews KA. **Persistence of Depression in African American and Caucasian Women at Midlife: Findings from the Study of Women Across the Nation (SWAN).** Arch Womens Ment Health 2014 Dec;17(6):549-57. doi: 10.1007/s00737-014-0444-5. Epub 2014 Jul 5. PMID: 24996377 PMCID: PMC4443669
Primary Question:
Summary of Findings: Similar percentages of African American and Caucasian women experienced recurrent depressive episodes over the 11-year follow-up period. Predictors of these episodes of depression varied across the two groups.
[WG#540]

311 Paramsothy P, Harlow SD, Greendale GA, Gold EB, Crawford SL, Elliott MR, Lisabeth LD, Randolph J Jr. **Bleeding Patterns During the Menopausal Transition in the Multi-ethnic Study of Women's Health Across the Nation (SWAN): a Prospective Cohort Study.** BJOG International Journal on Obstetrics and Gynaecology. 2014 Nov;121(12):1564-73. doi: 10.1111/1471-0528.12768. Epub 2014 Apr 16. PMID: 24735184 PMCID: PMC4199918

Primary Question:
Summary of Findings: Two patterns of bleeding are common during the MT, long-light bleeding and episodes of heavy bleeding. 3 out of 4 women experience at least 3 episodes of menses lasting 10+ days, 2 out of 3 women experience at least 3 episodes of 6+ days of spotting, and 1 out of 4 women experience at least 3 episodes of 3+ days of heavy bleeding.
[WG#188D]

312 Kline CE, Irish LA, Buysse DJ, Kravitz HM, Okun ML, Owens JF, Hall MH. **Sleep Hygiene Behaviors Among Midlife Women with Insomnia or Sleep-disordered Breathing: the SWAN Sleep Study.** Journal of Women's Health 2014 Nov;23(11):894-903. doi: 10.1089/jwh.2014.4730. Epub 2014 Oct 29. PMID: 25353709 PMCID: PMC4236092
Primary Question:
Summary of Findings: We found that midlife women with insomnia were less likely to engage in negative sleep behaviors (i.e., smoking, alcohol consumption, caffeine near bedtime, long daytime napping) compared to women without insomnia; specifically, women with insomnia were less likely to consume caffeine near bedtime and take long daytime naps. In contrast, women with sleep-disordered breathing were less likely to be physically active than women without sleep-disordered breathing; however, no other differences were found for these women.
[WG#419]

313 Kravitz HM, Schott LL, Joffe H, Cyranowski JM, Bromberger JT. **Do anxiety symptoms predict major depressive disorder in midlife women? The Study of Women's Health Across the Nation (SWAN) Mental Health Study (MHS)** Psychological Medicine. 2014 Sep;44(12):2593-602. doi: 10.1017/S0033291714000075. Epub 2014 Jan 27. PMID: 24467997 PMCID: PMC4135380
Primary Question:
Summary of Findings: We found that women with higher anxiety symptom scores at a given visit T were more likely to develop an episode of MDD the following year (T+1). This relationship was more likely for recurrent episodes of MDD than for a woman's first MDD episode. This increased risk for new occurrences of MDD in association with higher anxiety symptom levels did not differ between African-American or Caucasian women.
[WG#554]

314 Colvin A, Richardson GA, Cyranowski, JM, Youk, A, Bromberger JT. **Does Family History of Depression Predict Major Depression in Midlife Women? Study of Women's Health Across the Nation Mental Health Study (SWAN MHS).** Arch Womens Ment Health. 2014 Aug;17(4):269-78. doi: 10.1007/s00737-014-0433-8. Epub 2014 Jun 21. PMID: 24952069 PMCID: PMC4120816
Primary Question:
Summary of Findings: Family history of depression is a strong predictor of major depression in midlife women generally, but particularly in those with a lifetime history of depression prior to midlife. These results suggest that women with a family history of depression may benefit from closer monitoring of their mood during midlife.
[WG#632A]

315 Thurston R, Chang Y, Derby CA, Bromberger JT, Harlow SD, Janssen I, Matthews KA. **Abuse and Subclinical Cardiovascular Disease among Midlife Women: The Study of**

Women's Health Across the Nation. Stroke 2014 Aug;45(8):2246-51. doi: 10.1161/STROKEAHA.114.005928. Epub 2014 Jul 17. PMID: 25034715 PMCID: PMC4116433
Primary Question:
Summary of Findings: Childhood sexual abuse was associated with higher subclinical cardiovascular disease controlling for traditional cardiovascular risk factors.
[WG#713]

316 Khan UI, Wang D, Karvonen-Gutierrez CA, Khalil N, Ylitalo KR, Santoro N. **Progression from Metabolically Benign to At-Risk Obesity in Perimenopausal Women: A Longitudinal Analysis of Study of Women Across the Nation (SWAN).** J Clin Endocrinol Metab. 2014 Jul;99(7):2516-25. doi: 10.1210/jc.2013-3259. Epub 2014 May 20. PMID: 24846534 PMCID: PMC4079312
Primary Question:
Summary of Findings: It appears that other than obesity, abnormalities in glucose and lipid regulation are the strongest indicators of progression from metabolically benign to at-risk overweight/obese phenotype, a state that is unanimously associated with an elevated risk of cardiovascular morbidity and mortality.

During the present obesity epidemic, public health resources need to have a multi-prong approach, to not only focus on obesity prevention and treatment, but also to identify and treat those with glucose dysregulation and dyslipidemia. Of lifestyle modifications, an increase in physical activity may have the most impact in improving cardiometabolic health.

[WG#651]

317 Ostro B, Malig B, Broadwin R, Basu R, Gold EB, Bromberger JT, Derby C, Feinstein S, Greendale GA, Jackson EA, Kravitz HM, Matthews KA, Sternfeld B, Tomey K, Green RR, Green R. **Chronic PM2.5 Exposure and Inflammation: Determining Sensitive Subgroups in Mid-life Women.** Environmental Research 2014 Jul;132:168-75. doi: 10.1016/j.envres.2014.03.042. Epub 2014 May 8. PMID: 24792413 PMCID: PMC4314307
Primary Question:
Summary of Findings: We found that long-term exposure to fine particulate air pollution was associated with C-reactive protein. Effects were particularly large for diabetics and smokers. In addition, effects were observed among several subgroups including those with high blood pressure or cholesterol, high BMI, unmarried or post-menopausal.

[WG#618A]

318 Ishii S, Cauley JA, Greendale GA, Nielsen C, Karvonen-Gutierrez, C, Ruppert K, Karlamangla A. **Pleiotropic Effects of Obesity on Fracture Risk: the Study of Women's Health Across the Nation.** J Bone Miner Res 2014 Dec;29(12):2561-70. doi: 10.1002/jbmr.2303.PMID: 24986773 PMC:In process
Primary Question:
Summary of Findings: There are at least three major mechanisms by which obesity influences fracture risk: increased BMD in response to greater skeletal loading, increased impact forces during a fall, and greater absorption of impact forces by soft tissue padding.

The balance between these factors determines the overall fracture risk in an individual. [WG#716]

319 Polotsky AJ, Allshouse AA, Crawford SL, Harlow SD, Khalil N, Kazlauskaite R, Santoro N, Legro RS. **Hyperandrogenic Oligomenorrhea and Metabolic Risks Across Menopausal Transition.** J Clin Endocrinol Metab. 2014 Jun;99(6):2120-7. doi: 10.1210/jc.2013-4170. Epub 2014 Feb 11.
Primary Question:
Summary of Findings: Women with high levels of testosterone and a history of irregular menstrual periods do not appear to develop adverse risks factors for heart disease when they go through menopause.
[WG#624]

320 Janssen I, Dugan SA, Karavolos K, Lynch E, Powell LH. **Correlates of 15-Year Maintenance of Physical Activity in Middle-Aged Women.** International Journal of Behavioral Medicine. 2014; 21(3): 511-518. doi: 10.1007/s12529-013-9324-z.
Primary Question:
Summary of Findings: Women who have been consistently physically highly active have more self-determination and are more confidence in being able to engage in physical activity now. They are also likely to have a physically active friend. These findings confirm the theory needed for an intervention trial.
[WG#606]

321 Beatty DL, Matthews KA, Bromberger J, Brown C. **Everyday Discrimination Prospectively Predicts Inflammation Across 7-Years in Racially Diverse Midlife Women: Study of Women's Health Across the Nation.** J Soc Issues 2014 Jun 1;70(2):298-314.
Primary Question:
Summary of Findings: There was no main effect of discrimination on CRP and discrimination did not interaction with race. However, the association was conditional upon body mass index such that greater discrimination was associated with higher CRP among non-obese women.

[WG#508]

322 Janssen I, Landay AL, Ruppert K, Powell LH. **Moderate Wine Consumption is Associated with Lower Hemostatic and Inflammatory Factor Over 8 Years:The Study of Women's Health Across the Nation (SWAN).** Nutrition and Aging (Amst) 2014 Jun 12;2(2-3):91-99.DOI 10.3233/NUA-130034
Primary Question:
Summary of Findings: Moderate wine consumers had significantly lower levels of 4 of the 5 markers, i.e. C-reactive protein, fibrinogen, factor VII, and plasminogen activator inhibitor than women who drank no or little wine. These associations were independent of significant effects of healthy lifestyle and overall alcohol consumption and similar across ethnic groups.
[WG#715]

323 Jackson KL, Janssen I, Appelhans BM, Kazlauskaite R, Karavolos K, Dugan SA, Avery EA,

Shipp-Johnson KJ, Powell LH, Kravitz HM. **Body Image Satisfaction and Depression in Midlife Women: the Study of Women's Health Across the Nation (SWAN).** Archives of Women's Mental Health. 2014 Jun;17(3):177-87. doi: 10.1007/s00737-014-0416-9. Epub 2014 Mar 13.
Primary Question:
Summary of Findings: Body Image Dissatisfaction (perceived actual body size greater than perceived ideal body size) and perceived unattractiveness (unattractive vs. attractive) were both associated with high depressive symptoms (CES-D „d 16). No association was found for either body image discordance (actual body size greater than perceived actual body size) or weight satisfaction and high depressive symptoms. These results were found for the overall cohort of women; no difference by race (Caucasian vs African American) was found.
[WG#631]

324 El Khoudary SR, Brooks MM, Thurston RC, Matthews KA. **Lipoprotein subclasses and endogenous sex hormones in women at midlife.** Journal of Lipid Research J Lipid Res. 2014 Jul;55(7):1498-504. doi: 10.1194/jlr.P049064. Epub 2014 May 22
Primary Question:
Summary of Findings: Lower levels of E2 and SHBG, and higher levels of FAI were associated with a more atherogenic profile of lipoprotein-subclasses. Sex hormones oscillation at midlife may increase women's risk of coronary heart disease.
[WG#747]

325 Garcia L, Qi L, Rasor M, Clark CJ, Bromberger J, Gold EB. **The Relationship of Violence and Traumatic Stress to Changes in Weight and Waist Circumference: Longitudinal Analyses From the Study of Women's Health Across the Nation.** Journal of Interpersonal Violence. 2014;29(8):1459-1476.
Primary Question:
Summary of Findings: Our results indicated a significant association between any violence reported during follow-up in SWAN participants and changes in weight and waist circumference in both unadjusted and adjusted models. Women who reported violence, compared to women who did not, were significantly more likely to have changes (increases or decreases) in weight and waist circumference after adjusting for age, race/ethnicity, marital status, smoking, study site and follow-up year.
[WG#542]

326 Karvonen-Gutierrez CA, Harlow SD, Jacobson J, Mancuso P, Jiang Y. **The Relationship between Longitudinal Serum Leptin Measures and Measures of Magnetic Resonance Imaging-assessed Knee Joint Damage in a Population of Mid-life Women.** Annals of the Rheumatic Diseases. 2014 May;73(5):883-9. doi: 10.1136/annrheumdis-2012-202685. Epub 2013 Apr 10.
Primary Question:
Summary of Findings: Higher baseline serum leptin levels were associated with more severe knee joint damage assessed using MRI. Osteophytes, or bony outgrowths at the edge of the knee joint, were most strongly correlated with serum leptin. Leptin levels increased with age. Having more severe knee joint damage (assessed with MRI) was associated with higher leptin levels but the pattern of change was similar over time.
[WG#629D]

327 Thurston R, El Khoudary SR, Derby CA, Barinas-Mitchell EJ, Lewis T, McClure C, Matthews KA. **Low Socioeconomic Status Over 12 Years and Subclinical Cardiovascular Disease: The Study of Women's Health Across the Nation.** Stroke. 2014;45(4);954-960.
Primary Question:
Summary of Findings: Low education, low income and financial strain, particularly when experienced consistently over 12 years, were associated with a greater atherosclerosis among women free of clinical CVD. These associations persisted controlling for standard CVD risk factors and were broadly similar between racial/ethnic groups
[WG#670]

328 Irish LA, Kline CE, Rothenberger SD, Krafty RT, Buysse DJ, Kravitz HM, Bromberger JT, Zheng H, Hall MH. **A 24-hour Approach to the Study of Health Behaviors: Temporal Relationships Between Waking Health Behaviors and Sleep.** Annals of Behavioral Medicine. 2014;47(2):189-197.
Primary Question:
Summary of Findings: Our findings demonstrate that WHB likely influence subsequent sleep while sleep does not appear to affect subsequent WHB, and that these relationships are strongest in the context of weekly patterns rather than proximal daily associations.
[WG#628]

329 Crandall CJ, Han W, Greendale GA, Seeman T, Tepper P, Thurston R, Karvonen-Gutierrez C, Karlamangla AS. **Socioeconomic status in relation to incident fracture risk in the Study of Women's Health Across the Nation.** Osteoporosis Intl. 2014;25(4):1379-1388.
Primary Question:
Summary of Findings: Non-Caucasian women who had at least some education after college had a much lower risk of osteoporosis-related fractures than non-Caucasian women who had high school, or less than high school, education. This was not the case among Caucasian women, and income was not associated with risk of fracture.
[WG#663]

330 Gibson C, Matthews KA,Thurston R. **Daily Physical Activity and Hot Flashes in the Study of Women's Health Across the Nation (SWAN) Flashes Study.** Fertility and Sterility. 2014;101(4):1110-1116.
Primary Question:
Summary of Findings: Hot flashes that were reported by women but not captured with skin conductance monitors, or “false positive” hot flashes, were more likely to follow increases in physical activity. This was seen especially among women with depressive and anxious symptoms. Physical activity did not otherwise seem to trigger hot flashes.
[WG#690]

331 Appelhans BM, Sagawa E, Janssen I, Kazlauskaite R, Thurston RC, Lewis TT, Kravitz HM. **Employment Status, Depressive Symptoms, and Waist Circumference Change in Midlife Women: The Study of Women's Health Across the Nation (SWAN).** Annals of Epidemiology. 2014 Mar;24(3):187-92. doi: 10.1016/j.annepidem.2013.12.005. Epub 2013 Dec 28.
Primary Question:
Summary of Findings: Waist circumference increases were significantly higher during years of combined unemployment and elevated depressive symptoms (1.03 cm/year), and

significantly lower in years of full-time employment and elevated depressive symptoms (0.24 cm/year), compared to years of full-time employment and non-elevated depressive symptoms (0.51 cm/year). Employment status was unrelated to waist circumference in years without elevated depressive symptoms. The pattern of results did not vary according to initial waist circumference at baseline or ethnicity/race.
[WG#652]

332 Matthews KA, Chang Y, Thurston R, Bromberger J. **Child Abuse Is Related to Inflammation in Mid-life Women: Role of Obesity.** Brain, Behavior, and Immunity. 2014;26(2):29-34.
Primary Question:
Summary of Findings: Women who reported a history of child abuse and neglect had elevated levels of C-reactive protein in mid-life. The association was due in large part to elevated body mass index.
[WG#695]

333 Fu P,Matthews KA, Thurston RC. **How Well Do Different Measurement Modalities Estimate the Number of Vasomotor Symptoms? Findings from the Study of Women's Health Across the Nation FLASHES Study.** Menopause. 2014;21(2):124-30.
Primary Question:
Summary of Findings: Women underestimated the number of VMS at the end of the day compared to those prospectively-reported or physiologically-detected during the day, particularly for African-American or more anxious women. Women overestimated the number of VMS they experienced during the night, particularly if they had poorer sleep.
[WG#680]

334 Hale L, Troxel WM, Kravitz HM, Hall MH, Matthews KA. **Acculturation and Sleep among a Multiethnic Sample of Women: The Study of Women's Health Across the Nation (SWAN).** Sleep. 2014;37(2):309-317.
Primary Question:
Summary of Findings: Approximately one quarter of first-generation Hispanic, Chinese, and Japanese immigrant women reported any sleep complaint compared to 37% of those who were US-born. Our analyses showed that first-generation immigrants had lower odds of reporting any sleep complaints compared to US-born women of the same race/ethnic group. This finding was largely explained by language acculturation.
[WG#529]

335 Jacobs EA, Rathouz PJ, Karavolos K, Everson-Rose SA, Janssen I, Kravitz HM, Lewis TT, Powell LH. **Perceived Discrimination Is Associated with Reduced Breast and Cervical Cancer Screening: the Study of Women's Health Across the Nation (SWAN).** Journal of Women's Health. 2014;23(2):138-145.
Primary Question:
Summary of Findings: African American women reported the highest percentage of racial discrimination (35%) followed by Chinese (20%), Japanese (11%), Latina (12%), and white women (3%;$p<0.001$). Racial discrimination was significantly associated with reduced receipt of CBE. Reported discrimination due to "other" reasons such as age or gender was associated with reduced receipt of Pap smear, CBE), and mammography.
[WG#186]

336 Matthews KA, Chang Y, Kravitz HM, Bromberger JT, Owens JF, Buysse DJ, Hall MH. **Sleep and Risk for High Blood Pressure and Hypertension in Midlife Women: the SWAN (Study of Women's Health Across the Nation) Sleep Study.** Sleep Medicine. 2014;15(2):203-8.
Primary Question:
Summary of Findings: Short sleep and sleep continuity are unrelated to blood pressure and hypertension in this sample. Less short wave sleep is related to change in diastolic blood pressure over time, whereas more arousal (beta power) is related to having hypertension at baseline.
[WG#592]

337 El Khoudary SR, McClure CK, Vopham T, Karvonen-Gutierrez CA, Sternfeld B, Cauley JA, Khalil N, Sutton-Tyrrell K. **Longitudinal Assessment of the Menopausal Transition, Endogenous Sex Hormones, and Perception of Physical Functioning: The Study of Women's Health Across the Nation.** J Gerontol A Biol Sci Med Sci. 2014 Aug;69(8):1011-7. doi: 10.1093/gerona/glt285. Epub 2014 Jan 24.
Primary Question:
Summary of Findings: Surgical and natural menopause were significantly associated with greater limitation in PF. The greater limitations observed among surgical and postmenopausal women are most likely to be resulted from the changes in endogenous estrogen and androgens accompanying the menopausal transition.
[WG#643]

338 McClure CK, El Khoudary SR, Karvonen-Gutierrez CA, Ylitalo KR, Tomey K, VoPham T, Sternfeld B, Cauley, JA, Harlow S. **Prospective Associations between Inflammatory and Hemostatic Markers and Physical Functioning Limitations in Mid-life Women: Longitudinal Results of the Study of Women's Health Across the Nation (SWAN).** Experimental Gerontology. 2014;49(Jan):19-25.
Primary Question:
Summary of Findings: Higher CRP, a marker of inflammation, and higher tPA-ag, a hemostatic marker were associated with greater physical functioning limitations. Higher fibrinogen was associated with greater physical functioning limitations in African Americans only.
[WG#682]

339 Mori T, Ishii S, Greendale GA, Cauley JA, Sternfeld B, Crandall CJ, Han W, Karlamangla AS. **Physical Activity as Determinant of Femoral Neck Strength Relative to Load in Adult Women. Findings from the Hip Strength Across the Menopause Transition Study.** Osteoporosis International. 2014;25(1):265-272.
Primary Question:
Summary of Findings: Physical activity in each domain tested (sport, home, active living, and work) was associated with stronger hip bone in adult women. Therefore being physically active may be an important way to prevent hip fracture in the future.
[WG#642]

340 Ylitalo KR, Herman W, Harlow SD. **Monofilament Insensitivity and Small and Large**

Nerve Fiber Symptoms in Impaired Fasting Glucose. Primary Care Diabetes. 2013;7(4):309-313.
Primary Question:
Summary of Findings: The prevalence of peripheral neuropathy is substantial but varies according to the method of assessment. Regardless of assessment method, women with neuropathy and diabetes have larger body sizes, higher HbA1c values, and are more likely to be hypertensive.
[WG#548C]

341 Kim C, Harlow S, Karvonen-Gutierrez CA, Randolph J, Helmuth M, Kong S, Nan B, Carlos R. **Racial/Ethnic Differences in Hepatic Steatosis in a Population-based Cohort of Postmenopausal Women: the Michigan Study of Women's Health Across the Nation.** Diabetic Medicine. 2013;30(12):1433-1441.
Primary Question:
Summary of Findings: Caucasians had fatty liver more often than African-Americans and sex hormone binding globulin, a protein that binds to sex hormones, was associated with a decreased odds of having fatty liver, but other sex hormones were not associated with fatty liver.
[WG#657]

342 Lasley B, Crawford S, McConnell DS. **Ovarian-adrenal Interactions during the Menopausal Transition.** Minerva Ginecologica. Minerva Ginecol. 2013 Dec;65(6):641-51.PMID: 24346252
Primary Question:
Summary of Findings: The adrenal cortex may be a primary contributor to circulating sex steroids in most women
[WG#731]

343 El Khoudary SR, Shields KJ, Chen H, Matthews KA. **Menopause, Complement, and Hemostatic Markers in Women at Midlife: The Study of Women's Health Across the Nation.** Atherosclerosis. 2013;231(1):54-8.
Primary Question:
Summary of Findings: In the current pilot study complement protein C3 but not C4 was found to be significantly related to menopausal status independent of age, race and BMI. Further, the association between C3 and postmenopausal status were found to be more pronounced among obese women. Both complement proteins C3 and C4 were found to be significantly associated with hemostatic/coagulation markers in women at midlife. Complement protein C3 was independently associated with two important hemostatic markers, PAI-1 and tPA antigen. These markers have significant roles in thrombus development, stabilization and destabilization in lesion areas. C4 was independently associated with thrombus development factors: factor VIIc and fibrinogen.
[WG#693]

344 Diem SJ, Ruppert K, Cauley JA, Lian Y, Bromberger JT, Finkelstein JS, Greendale GA, Solomon DH. **Rates of Bone Loss Among Women Initiating Antidepressant Medication Use in Midlife.** Journal of Clinical Endocrinology & Metabolism. 2013;98(11):4355-4363.doi: 10.1210/jc.2013-1971. Epub 2013 Sep 3.
Primary Question:

Summary of Findings: Women initiating use of a SSRI or TCA did not have higher rates of subsequent bone loss at the spine, total hip, or femoral neck than women not initiating use of these medications. Results were similar in women with and without evidence of significant depressive symptoms.
[WG#638]

345 Hall MH, Middleton K, Thayer JF, Lewis TT, Kline CE, Matthews KA, Kravitz H, Krafty RT, Buysse DJ. **Racial Differences in Heart Rate Variability during Sleep in Midlife Women: The SWAN Sleep Study.** Psychosomatic Medicine. 2013;75(8):783-790.
Primary Question:
Summary of Findings: Analyses revealed that HRV during sleep differed significantly by race after adjusting for possible confounders. High frequency HRV during non-rapid eye movement (NREM) and rapid eye movement (REM) sleep was higher in African American and Chinese women, compared to Caucasian women (p's < 0.001). Sympathovagal tone (ratio of low-to-high frequency HRV) during NREM and REM sleep was significantly lower in African American and Chinese women, compared to Caucasian women (p's < 0.001). Heart rate variability during sleep did not differ between African American and Chinese women.
[WG#515]

346 Putman M, Yu E, Lee H, Neer R, Schindler E, Taylor AP, Cheston E, Bouxsein M, Finkelstein JS. **Differences in Skeletal Microarchitecture and Strength in African-American and White Women.** Journal of Bone and Mineral Research. 2013;28(10):2177-2185.
Primary Question:
Summary of Findings: Structurally advantageous differences in bone microarchitecture and density contribute to greater bone strength in African Americans and may be a key factor that leads to the lower fracture risk observed in African-American women.
[WG#601]

347 Thurston RC, Chang Y, Mancuso P, Matthews KA. **Adipokines, adiposity, and vasomotor symptoms during the menopause transition: findings from the Study of Women's Health Across the Nation.** Fertility and Sterility. Fertil Steril. 2013 Sep;100(3):793-800.PMID:23755948
Primary Question:
Summary of Findings: Lower adiponectin, lower HMW adiponectin, and to a lesser extent higher leptin were associated with lower odds of hot flashes early, but not later, in the menopause transition. These adiokines accounted in part, but not fully, for relations between BMI and VMS.
[WG#626]

348 Ishii S, Cauley JA, Greendale GA, Crandall CJ, Huang MH, Danielson ME, Karlamangla AS. **Trajectories of femoral neck strength in relation to the final menstrual period in a multi-ethnic cohort.** Osteroporosis International. 2013;24(9):2471-2781.
Primary Question:
Summary of Findings: Femoral neck strength relative to load declines significantly during the menopausal transition, with declines commencing one to two years prior to the final menstrual period. The major determinants of rates of decline are race/ethnicity, history of smoking, body mass index and use of sex steroid hormones.
[WG#570]

349 Kline CE, Irish LA, Krafty RT, Sternfeld B, Kravitz HM, Buysse DJ, Bromberger JT, Dugan SA, Hall MH. **Consistently High Sports/Exercise Activity is Associated with Better Sleep Quality, Continuity and Depth in Midlife Women: the SWAN Sleep Study.** Sleep. 2013 Sep 1;36(9):1279-88. doi: 10.5665/sleep.2946.
Primary Question:
Summary of Findings: We found transportation-related physical activity and household-related physical activity to be largely unrelated to sleep, regardless of whether recent levels or the historical pattern were considered. In contrast, greater recent levels of recreational physical activity, as well as consistently high levels of recreational physical activity, were associated with better sleep quality, sleep continuity, and sleep depth in this sample of midlife women.
[WG#599]

350 Lambiase MJ, Thurston RC. **Physical Activity and Sleep Among Midlife Women with Vasomotor Symptoms.** Menopause. Menopause. 2013 Sep;20(9):946-52. PMID:23531686
Primary Question:
Summary of Findings: Physical activity, particularly household physical activity, was associated with better sleep characteristics in our sample of midlife women. These associations were observed primarily among Caucasian and non-obese midlife women.
[WG#676]

351 Matthews KA, Gibson CJ, El Khoudary SR, Thurston RC. **Changes in Cardiovascular Risk Factors by Hysterectomy Status With and Without Oophorectomy: Study of Women's Health Across the Nation.** JACC. 2013;62(3):191-200.
Primary Question:
Summary of Findings: Midlife women experience an increase in cardiovascular risk factors following natural menopause and hysterectomy with or without bilateral oophorectomy. These risks do not appear to be increased by surgical menopause.
[WG#619C]

352 Ishii S, Cauley JA, Greendale GA, Crandall CJ, Danielson ME, Ouchi Y, Karlamangla AS. **C-Reactive Protein, Bone Strength, and Nine-year Fracture Risk: Data from The Study of Women's Health Across the Nation (SWAN).** Journal of Bone and Mineral Research. J Bone Miner Res. 2013 Jul;28(7):1688-98. PMID: 23456822
Primary Question:
Summary of Findings: CRP values were associated inversely with composite strength indices, and the lower values of femoral neck composite strength indices with high CRP explained some but not all of the positive association between CRP and fracture risk.
[WG#623]

353 Gold EB, Crawford SL, Avis NE, Crandall CJ, Matthews KA, Waetjen LE, Lee JS, Thurston R, Vuga M, Harlow SD **Factors Related to Age at Natural Menopause: Longitudinal Analyses from SWAN.** American Journal of Epidemiology. Am J Epidemiol. 2013 Jul 1;178(1):70-83. Epub 2013 Jun 20. PMID: 23788671
Primary Question:
Summary of Findings: Higher education, prior use of oral contraceptives, being employed,

not smoking, not having diabetes, having lower baseline weight and less increase in weight over follow-up, better self-rated health and lower follicle stimulating hormone were significantly independently associated with later age at the FMP. We found no significant racial/ethnic differences in age at natural FMP after controlling for multiple sociodemographic, lifestyle and health factors. Our results and those of others suggest that the age at natural FMP reflects a complex inter-relation of factors, many of which are related to better health, which may partially explain the relation of late age at FMP to reduced morbidity and mortality.
[WG#451]

354 Ylitalo KR, Karvonen-Gutierrez CA, Fitzgerald N, Zheng H, Sternfeld B, El Khoudary SR, Harlow SR. **Relationship of Race/Ethnicity, Body Mass Index, and Economic Strain with Longitudinal Self-Report of Physical Functioning: The Study of Women's Health Across the Nation.** Annals of Epidemiology. 2013:23(7):401-408.
Primary Question:
Summary of Findings: The prevalence of physical functioning limitations is high among mid-life women. Race/ethnicity, obesity, and economic strain are associated with prevalence and onset of physical functioning limitations. Nevertheless, improvement in functioning is common during this life stage.
[WG#653]

355 Sowers MR, Zheng H, Greendale GA, Neer RM, Cauley JA, Ellis J, Johnson S, Finkelstein JS. **Changes in Bone Resorption Across the Menopause Transition: Effects of Reproductive Hormones, Body Size, and Ethnicity.** J Clin Endocrinol Metab. Erratum in J Clin Endocrinol Metab. 2014 May; 99(5):1910. J Clin Endocrinol Metab. 2013 Jul;98(7):2854. Epub 2013 May 10. PMID: 23666961.
Primary Question:
Summary of Findings: There is an orderly progression in which a decline in ovarian function beginning about 2 years before the FMP is followed by an increase in bone resorption and subsequently to accelerated bone loss during the menopause transition. The increase in bone resorption across the transition is inversely associated with BMI. Ethnic differences in the mean NTX increase are attenuated, but not eliminated, by adjustment for BMI. The data suggest that ethnic differences in BMI, and corresponding ethnic differences in bone resorption, account for ethnic differences in peri-menopausal bone loss.
[WG#437]

356 Lewis TT, Troxel WM, Kravitz HM, Bromberger JT, Matthews KA, Hall MH. **Chronic Exposure to Everyday Discrimination and Sleep in a Multiethnic Sample of Middle-Aged Women.** Health Psychology. Health Psychol. 2013 Jul;32(7):810-9. PMID:23088174
Primary Question:
Summary of Findings: Women who reported experiencing discrimination and mistreatment on a day-to-day basis over time reported more difficulty sleeping at night and spent more time awake after falling asleep for the night. Experiencing discrimination had a similar impact on sleep for African-American, Caucasian and Chinese women, and did not affect one racial/ethnic group more than the others.
[WG#504]

357 Paramsothy P, Harlow SD, Elliot MR, Lisabeth LD, Crawford SL, Randolph JF Jr. **Classifying Menopausal Stage by Menstrual Calendars and Annual Interviews: Need for Improved Questionnaires: need for improved questionnaires** Menopause. Menopause. 2013 Jul;20(7):727-35. PMID: 23481122
Primary Question:
Summary of Findings: Poor agreement was found between annual interview/annual FSH measures and menstrual calendars. Overall, the menstrual calendars staged women earlier than annual interview. The annual interview questions fail to capture the late menopausal transition in approximately one out of every three participants (they go from early menopausal transition to FMP).
[WG#535]

358 Karvonen-Gutierrez C, Ylitalo K. **Prevalence and correlates of disability in a late middle aged population of women.** Journal of Aging and Health. 2013;25(4):701-717.
Primary Question:
Summary of Findings: The prevalence of moderate to severe global disability among the Michigan SWAN population was 20%. Important correlates of global disability included race/ethnicity, economic strain, depressive symptoms and peripheral neuropathy. Additionally, knee osteoarthritis, obesity and hypertension were associated with the mobility disability domain.
[WG#685]

359 Gibson CJ, Thurston RC, El Khoudary SR, Sutton-Tyrrell K, Matthews KA. **Body Mass Index Following Natural Menopause and Hysterectomy with and without Bilateral Oopherectomy.** International Journal of Obesity. 2013; 37(6):809-813.
Primary Question:
Summary of Findings: Midlife women experience an increase in body mass index in the years leading up to and following natural menopause and hysterectomy with or without bilateral oophorectomy. Body mass index increases at an accelerated rate in women following hysterectomy with bilateral oophorectomy compared to following natural menopause, suggesting that oophorectomy may contribute to weight gain and risks for obesity and overweight-related diseases in the postmenopause.
[WG#619B]

360 Karvonen-Gutierrez CA, Harlow SD, Mancuso P, Jacobson J, Mendes de Leon CF, Nan B. **Association of Leptin Levels With Radiographic Knee Osteoarthritis Among a Cohort of Midlife Women** Arthritis Care Research. 2013; 65(6): 936-944.
Primary Question:
Summary of Findings: Higher leptin levels were associated with having knee osteoarthritis and with developing knee osteoarthritis over-and-above the impact of higher body size. Leptin levels increased with age similar patterns of change were observed for women with knee OA at the beginning of follow-up, women who developed knee OA during follow-up and women who did not have knee OA during follow-up.
[WG#629C]

361 Lin WT, Beattie M, Chen L, Oktay K, Crawford SL, Gold EB, Cedars M, Rosen M. **Comparison of age at natural menopause in BRCA1/2 mutation carriers to a non-clinic-based sample of women in northern California.** Cancer. 2013; 119(9): 1652-1659.

Primary Question:
Summary of Findings: BRCA 1/2 carriers will undergo earlier natural menopause than the general population by 3-4 years. BRCA 1/2 carriers who are current heavy smokers will undergo even earlier menopause.
[WG#612]

362 Kavanagh K, Espeland MA, Sutton-Tyrrell K, Barinas-Mitchell E, El Khoudary SR, Wildman R. **Liver fat and sex hormone binding globulin affect insulin resistance in midlife women: The Study of Women Across the Nation (SWAN).** Obesity. 2013;21(5):1031-1038.
Primary Question:
Summary of Findings: Liver fat and SHBG were each associated with insulin concentrations even when measures of fatness were accounted for, and these associations were not diminished when their relationship with insulin was adjusted for each other. This suggests that liver fat and sex hormone binding globulin affect insulin through independent mechanisms.
[WG#609]

363 Bromberger JT, Kravitz HM, Chang Y, Randolph JF, Avis NE, Gold EB, Matthews KA. **Does risk for anxiety increase during the menopausal transition? Study of women's health across the nation.** Menopause. 2013;20(5):488-495.
Primary Question:
Summary of Findings: Overall women were not more likely to report high anxiety during and after the menopausal transition than premenopause. However, women with low anxiety at study entry were at greater risk when they were perimenopausal or postmenopausal compared to when they were premenopausal. Women with high anxiety at study entry were at similar risk for high anxiety at all stages of the transition. Perimenopause or postmenopause did not increase risk for high anxiety in this group.
[WG#252F]

364 Ylitalo KR, Herman W, Harlow SD. **Performance-based Physical Functioning and Peripheral Neuropathy in a Population-based Cohort of Mid-life Women.** American Journal of Epidemiology. 2013;177(8):810-817.
Primary Question:
Summary of Findings: Physical functioning differed between women with peripheral neuropathy and women without peripheral neuropathy. These differences were maintained or exacerbated over time for a variety of performance-based physical functioning tasks.
[WG#548B]

365 Crandall CJ, Tseng C, Karlamangla AS, Finkelstein JS, Randolph JF, Thurston RC, Huang M, Zheng H, Greendale GA. **Serum Sex Steroid Levels and Longitudinal Changes in Bone Density in Relation to the Final Menstrual Period.** Journal of Clinical Endocrinology & Metabolism. 2013; 98(4):E654-E663.
Primary Question:
Summary of Findings: The relationships between hormone levels and bone loss varied in the various phases of the menopausal transition.
[WG#621]

366 Danielson ME, Beck TJ, Karlamangla AS, Greendale GA, Atkinson EJ, Lian Y, Khaled AS, Keaveny TM, Kopperdahl D, Ruppert K, Greenspan S, Vuga M, Cauley JA. **A Comparison of DXA and CT Based Methods for Estimating the Strength of the Femoral Neck in Post-menopausal Women.** Osteoporosis International. 2013; 24(4): 1379-1388.
Primary Question:
Summary of Findings: We observed significant correlations between DXA- and QCT-derived measures of femoral neck geometry. Good correlations between simple strength indices indicate that the geometry of femoral neck cross-sections is reasonably well characterized by DXA methods. The results indicate that geometry based stress analyses are valid and that simple indices generated from conventional BMD also have value.
[WG#483]

367 Waetjen LE, Leung K, Crawford SL, Huang MH, Gold EB, Greendale GA. **Relationship Between Dietary Phytoestrogens and Development of Urinary Incontinence in Midlife Women.** Menopause. 2013;20(4);428-436.
Primary Question:
Summary of Findings: In our multivariate models, we found no relationship between the consumption level of any phytoestrogen (isoflavones, coumestrol or lignans) and the development of new onset stress or urge UI in midlife women.
[WG#565]

368 Danielson ME, Beck TJ, Lian Y, Karlamangla AS, Greendale GA, Ruppert K, Lo J, Greenspan S, Vuga M, Cauley JA. **Ethnic Variability in Bone Geometry as Assessed by Hip Structural Analysis: Findings from the Hip Strength Across the Menopausal Transition Study.** Journal of Bone and Mineral Research. 2013; 28(4): 771-779.
Primary Question:
Summary of Findings: African-American and Japanese women have more favorable hip geometry and strength than Caucasian and Chinese women. These findings may help explain the observed racial/ethnic differences in fracture rates.
[WG#487]

369 Greendale GA, Ishii S, Huang M, Karlamangla AS. **Predicting the Timeline to the Final Menstrual Period: The Study of Women's Health Across the Nation.** Journal of Clinical Endocrinology & Metabolism. 2013;98(4);1483-1491.
Primary Question:
Summary of Findings: The models with current and one prior (pre-menopausal or early perimenopausal) serum level of E2 and FSH, along with concurrent values of age, menopause transition stage and whether the current serum sample was obtained in the early follicular phase can discern women had crossed selected landmark dates on the timeline to becoming postmenopausal (2 years prior to FMP, 1 year prior to FMP and FMP) and the models' discrimination abilities were excellent.
[WG#602]

370 Wildman RP, Wang D, Fernandez I, Mancuso P, Santoro N, Scherer PE, Sowers MR. **Associations of Testosterone and Sex Hormone Binding Globulin with Adipose Tissue Hormones in Midlife Women.** Obesity. 2013 Mar;21(3):629-36. doi: 10.1002/oby.20256.
Primary Question:
Summary of Findings: Testosterone was weakly negatively associated with adiponectin

and soluble leptin receptor, and weakly positively associated with leptin, though the latter association was attenuated after adjustment for fat mass. SHBG associations were in the opposite direction of those listed for testosterone above, were much stronger, and were not attenuated by adjustment for fat mass, HOMA, or waist circumference.
[WG#574]

371 Gold EB, Leung K, Crawford SL, Huang MH, Waetjen LE, Greendale GA. **Phytoestrogen and Fiber Intakes in Relation to Incident Vasomotor Symptoms: Results From the Study of Women's Health Across the Nation.** Menopause. 2013; 20(3):305-314.
Primary Question:
Summary of Findings: No consistent patterns emerged for the relations of any dietary phytoestrogens or fiber to incident VMS. Although some adjusted odds ratios were statistically significant, patterns were not monotonic for intake amounts related to frequency of VMS.
[WG#564]

372 Midei AJ, Matthews KA, Chang YF, Bromberger JT. **Childhood Physical Abuse Is Associated with Incident Metabolic Syndrome in Mid-Life Women.** Health Psychology. 2013;32(2):121-127.
Primary Question:
Summary of Findings: Childhood physical abuse is associated with incident metabolic syndrome over the follow-up visits, independent of race, age at baseline, time-dependent menopausal status, cigarette smoking, physical activity, alcohol abuse, childhood socioeconomic status, and adulthood socioeconomic status.
[WG#524]

373 Ylitalo KR, Herman WH, Harlow SD. **Serial anthropometry predicts peripheral nerve dysfunction in a community cohort.** Diabetes/Metabolism Research and Reviews. 2013;29(2):145-151.
Primary Question:
Summary of Findings: On average, Michigan SWAN participants increased in body size between 1996 and 2008. Women with peripheral neuropathy had larger body sizes than women without peripheral neuropathy. Differences in BMI, waist circumference, and weight between neuropathy groups were maintained over time.
[WG#548A]

374 Matthews KA, Everson-Rose SA, Kravitz HM, Lee L, Janssen I, Sutton-Tyrrell K. **Do reports of sleep disturbance relate to coronary and aortic calcification in healthy middle-aged women?: Study of Women's Health across the Nation.** Sleep Medicine 2013;14(3):282-7.
Primary Question:
Summary of Findings: Insomnia-like symptoms, short sleep duration, and ratings of poor sleep quality are associated with high aortic calcification scores in African American and Caucasian women. Adjustments for cardiovascular risk factors and depressive symptoms showed that waking up earlier than anticipated and unable to get back to sleep and ratings of poor sleep quality remain associated with high aortic calcification scores. Sleep characteristics were unrelated to high coronary calcification scores.
[WG#293]

375 Appelhans BM, Janssen I, Cursio JF, Matthews KA, Hall M, Gold EB, Burns JW, Kravitz HM. **Sleep Duration and Weight Change in Midlife Women: The SWAN Sleep Study.** Obesity. 2013; 21(1): 77-84.
Primary Question:
Summary of Findings: Shorter sleep duration, reflected in sleep actigraphy and diary measures, was associated with higher BMI in cross-sectional analyses, even when controlling for sleep-disordered breathing. However, sleep duration was not prospectively associated with BMI change in unadjusted or fully-adjusted models.
[WG#588]

376 El Khoudary SR, Wildman RP, Matthews K, Thurston RC, Bromberger JT, Sutton-Tyrrell K. **Progression Rates of Carotid Intima-media Thickness and Adventitial Diameter during the Menopausal Transition.** Menopause. 2013;20(1):8-14.
Primary Question:
Summary of Findings: During the menopausal transition, and particularly during the late peri-menopause, the carotid artery undergoes an adaptation that is reflected in increases in Adventitial Diameter followed by increases in Intima-media Thickness. These changes may impact the vulnerability of the vessel in the postmenopausal period, suggesting that the peri-menopause stage as a critical time for applying intervention strategies.
[WG#459C]

377 Appelhans BM, Kazlauskaite R, Karavolos K, Janssen I, Kravitz HM, Dugan S, Burns JW, Shipp-Johnson K, Powell LH. **How Well Does the Body Adiposity Index Capture Adiposity Change in Midlife Women?: The SWAN Fat Patterning Study.** American Journal of Human Biology 2012;24(6):866-869.
Primary Question:
Summary of Findings: BAI shows similar cross-sectional associations with percent body fat (derived from a DXA scan) as BMI, but is slightly less accurate in tracking change in percent body fat.
[WG#604]

378 Cyranowski JM, Schott LL, Kravitz HM, Brown C, Thurston RC, Joffe H, Matthews KA, Bromberger JT. **Psychosocial Features Associated with Lifetime Comorbidity of Major Depression and Anxiety Disorders among a Community Sample of Mid-Life Women: The SWAN Mental Health Study.** Depression and Anxiety. 2012; 29(12):1050-1057.
Primary Question:
Summary of Findings: As compared with women with a history of either MDD or anxiety alone, women with a lifetime history of both MDD and anxiety reported a more severe and recurrent psychiatric history, greater levels of depressive and anxiety symptoms, elevated reports of past-year distressing life events, poorer social functioning, and diminished social support. Exploratory analyses indicated that women with a comorbid history were also more likely to report childhood abuse or neglect, as compared with women with a history of either MDD or anxiety alone.
[WG#551]

379 Tseng LA, El Khoudary SR, Young EA, Farhat GN, Sowers M, Sutton-Tyrrell K, Newman AB.

The Association of Menopause Status with Physical Function: The Study of Women's Health Across the Nation. Menopause. 2012;19(11):1186-1192.
Primary Question:
Summary of Findings: Women with surgical or naturally occurring post-menopause reported greater limitations in physical function than pre-menopausal women, independent of age, only partly explained by higher BMI and depressive symptoms.
[WG#501]

380 El Khoudary SR, Wildman RP, Matthews K, Thurston RC, Bromberger JT, Sutton-Tyrrell K. **Endogenous Sex Hormones Impact the Progression of Subclinical Atherosclerosis in Women during the Menopausal Transition.** Artherosclerosis. 2012; 225(1): 180-186
Primary Question:
Summary of Findings: Independent of SBP, BMI, lipids and other covariates, lower E2 and SHBG, and higher FAI and FSH were associated with increased subclinical atherosclerosis progression in women during the menopausal transition.
[WG#459D]

381 Cauley JA, Danielson ME, Greendale GA, Finkelstein JS, Lo JC, Crandall CJ, Neer RM, Ruppert K, Meyn L, Prairie BA , Sowers MR. **Bone Resorption and Fracture across the Menopausal Transition: The Study of Women's Health Across the Nation (SWAN).** Menopause. 2012;19(11):1200-1207.
Primary Question:
Summary of Findings: Higher levels of the bone resorption marker, NTX, and greater increases in NTX over the menopausal transition are significantly associated with an increase in fracture risk. These associations were independent of BMD, E2, FSH and other potential covariates. Serum osteocalcin, a marker of osteoblast activity, was also associated with fracture risk in unadjusted analyses only.
[WG#527]

382 Ishii S, Greendale GA, Cauley JA, Crandall CJ, Huang MH, Danielson ME, Karlamangla AS. **Fracture Risk Assessment without Race/Ethnicity Information.** The Journal of the Clinical Endocrinology & Metabolism. 2012;97(10):3593-3602.
Primary Question:
Summary of Findings: Composite strength indices of femoral neck predict fracture risk in middle-age women going through the menopause transition, and can predict risk of fracture at any body site (not limited to femoral neck) without information regarding the person's race/ethnicity.
[WG#598]

383 Thurston RC, El Khoudary SR, Sutton-Tyrrell K, Crandall CJ, Sternfeld B, Joffe H, Gold EB, Selzer F, Matthews KA. **Vasomotor Symptoms and Insulin Resistance in the Study of Women's Health Across the Nation.** Journal of Clinical Endocrinology & Metabolism. 2012;97(10):3487-3494.
Primary Question:
Summary of Findings: We found hot flash reporting to be associated with higher glucose and HOMA, an indicator of insulin resistance. These associations persisted controlling for cardiovascular risk factors and reproductive hormone concentrations.
[WG#461E]

384 Wildman RP, Tepper PG, Crawford S, Finkelstein JS, Sutton-Tyrrell K, Thurston RC, Santoro N, Sternfeld B, Greendale GA. **Do Changes in Sex Steroid Hormones Precede or Follow Increases in Body Weight during the Menopause Transition? Results from The Study of Women's Health Across the Nation.** Journal of Clinical Endocrinology and Metabolism. 2012;97(9):E1695-E1704.
Primary Question:
Summary of Findings: Current waist circumference predicted future SHBG, testosterone, and FSH, but not vice-versa. Estradiol results were distinct from those above, changing direction across the menopause transition. Estradiol and waist circumference were negatively associated in early menopausal transition stages and positively associated in later transition stages. In addition, they appeared to be reciprocal, with current waist circumference associated with future estradiol, and current estradiol associated with future waist circumference. However, associations in the direction of current waist circumference predicting future estradiol levels were of considerably larger magnitude than the reverse. In SWAN, the predominant temporal sequence is that weight gain leads to changes in sex steroids.
[WG#375B]

385 Khan UI, Wang D, Sowers MR, Mancuso P, Everson-Rose SA, Scherer PE, Wildman RP. **Race-Ethnic Differences in Adipokine Levels: The Study of Women's Health Across the Nation (SWAN).** Metabolism. 2012;61(9):1261-1269.
Primary Question:
Summary of Findings: We found that compared to Caucasian women, African American women had lower levels of adiponectin and high molecular weight adiponectin and higher levels of leptin and soluble leptin receptor molecule despite adjusting for fat mass.

In addition, compared to Caucasian women, both Chinese and Japanese women also had lower levels of adiponectin and high molecular weight adiponectin after accounting for differences in fat mass. There were no differences in leptin levels.

All race-ethnic differences were more apparent at lower tertiles of fat mass and were attenuated at higher fat mass tertiles.
[WG#577]

386 Bromberger JT, Schott LL, Matthews KA, Kravitz HM, Randolph JF Jr, Harlow S, Crawford S, Green R, Joffe H. **Association of past and recent major depression and menstrual characteristics in midlife: Study of Women's Health Across the Nation.** Menopause. 2012; 19(9): 959-966.
Primary Question:
Summary of Findings: Results showed that after accounting for other factors, current major depression (within the last year) is associated with a premenstrual like syndrome in midlife. Whereas, past (i.e. lifetime history of) major depression is associated with an increase in heavy bleeding symptoms in midlife independent of known risk factors for heavy bleeding. Neither current nor past major depression is associated with irregular bleeding symptoms in midlife.
[WG#162]

387 Kim C, Nan B, Kong S, Harlow S. **Changes in Iron Measures over Menopause and Associations with Insulin Resistance.** Journal of Women's Health (Larchmt). 2012;21(8):872-877.
Primary Question:
Summary of Findings: From premenopause to postmenopause, women on average have increases in iron, and lower premenopausal iron stores and greater increases in iron over the menopause were associated with increases in insulin resistance.
[WG#603]

388 Tepper PG, Randolph JF Jr, McConnell DS, Crawford SL, El Khoudary SR, Joffe H, Gold EB, Zheng H, Bromberger JT, Sutton-Tyrrell K. **Trajectory Clustering of Estradiol and Follicle Stimulating Hormone during the Menopausal Transition among Women in the Study of Women's Health Across the Nation (SWAN).** Journal of Clinical Endocrinology & Metabolism. 2012;97(8):2872-2880.
Primary Question:
Summary of Findings: During the menopausal transition, the change in the serum levels of both E2 and FSH vary between women and fall into several distinct patterns. We were able to distinguish four unique E2 and three unique FSH changing groups. These differing groups were strongly related to race/ethnicity and BMI but not smoking, physical activity, or demographic variables.
[WG#532]

389 Greendale GA, Huang MH, Leung K, Crawford SL, Gold EB, Wight R, Waetjen E, Karlamangla AS. **Dietary phytoestrogen intakes and cognitive function during the menopausal transition: results from the Study of Women's Health Across the Nation Phytoestrogen Study.** Menopause. 2012;19(8):894-903.
Primary Question:
Summary of Findings: During the late perimenopause and postmenopause stages, Asian women with high isoflavone intakes did better on processing speed, but during early perimenopause and postmenopause, high isoflavone Asian consumers performed worse on verbal recall. The highest isoflavone consumers among non-Asians likewise posted lower verbal memory scores during early perimenopause. A verbal memory benefit of higher dietary lignan consumption was apparent only during late perimenopause, when women from all ethnic/racial groups who were in the highest intake group demonstrated did a little bit better on the verbal test. Coumestrol was unrelated to cognitive performance.
[WG#562]

390 Thurston RC, Santoro N, Matthews KA. **Are vasomotor symptoms associated with sleep characteristics among symptomatic midlife women? Comparisons of self-report and objective measures.** Menopause. 2012 Jul;19(7):742-748.
Primary Question:
Summary of Findings: The relation between VMS and sleep may depend upon the awareness VMS, not simply their occurrence.
[WG#591]

391 Kazlauskaite R, Karavolos K, Janssen I, Carlson K, Shipp KJ, Dugan SA, Powell LH. **The Association between Self-Reported Energy Intake and Intra-Abdominal Adipose Tissue in Perimenopausal Women** Journal of Obesity J. Obesity, 2012;2012:567320. Epub 2012

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Primary Question:
Summary of Findings: We found that excess energy from food is stored as toxic belly fat in mid-life women. When Caucasian women eat more calories they store more fat inside belly than African American women of the same weight. There is no “free lunch” after menopause: women after menopause have more belly fat.
[WG#490]

392 McConnell DS, Stanczyk FZ, Sowers MR, Randolph JF Jr, Lasley BL. **Menopausal Transition Stage-Specific Changes in Circulating Adrenal Androgens.** Menopause. 2012;19(6):658-663.
Primary Question:
Summary of Findings: There is a correlation between adrenal androgens DHEAS and Adiol as well as the more potent androgens. Changes in adrenal androgen production rate during the menopausal transition may be important than the decline of ovarian function in terms of altering the estrogen/androgen balance.
[WG#255D]

393 Polotsky AJ, Allshouse A, Crawford S, Harlow SD, Khalil N, Santoro N, Legro RS. **Relative Contributions of Oligomenorrhea and Hyperandrogenemia to the Risk of Metabolic Syndrome in Midlife Women.** The Journal of Clinical Endocrinology & Metabolism. 2012;97(6):E868-E877.
Primary Question:
Summary of Findings: Among SWAN participants, women with high serum androgens were at a high risk for metabolic and cardiovascular risks factors, independent of body mass and other factors. Women with a history of irregular menstrual periods and high serum androgens have shown evidence of the highest risk for metabolic and cardiovascular risks factors, while those with a history of irregular menstrual periods but normal androgens do not exhibit increased metabolic risk.
[WG#593]

394 Hall MH, Okun ML, Sowers M, Matthews KA, Kravitz HM, Hardin K, Buysse DJ, Bromberger JT, Owens JF, Karpov I, Sanders MH. **Sleep is Associated with the Metabolic Syndrome in a Multi-ethnic Cohort of Midlife Women: The SWAN Sleep Study.** Sleep. 2012;35(6):783-790.
Primary Question:
Summary of Findings: Sleep disordered breathing and light sleep were both related to the metabolic syndrome in a multi-ethnic sample of midlife women. Women with both types of sleep disturbances were much more likely to have the metabolic syndrome compared to women with no sleep disturbances.
[WG#423]

395 Lasley BL, Chen J, Stanczyk FZ, El Khoudary SR, Gee NA, Crawford S, McConnell DS. **Androstenediol Complements Estrogenic Bioactivity during the Menopausal Transition.** Menopause. 2012;19(6): 650-657.
Primary Question:
Summary of Findings: The wide range of circulating levels of Adiol and its contribution to total circulating estrogenicity during the MT is consistent with the observed inter-woman

difference in symptoms at this time. Therefore, we conclude that Adiol contributes to circulating estrogenicity when E2 production falls at menopause and may contribute significantly to the endocrine changes experienced by midlife women.
[WG#255C]

396 Gibson CJ, Joffe H, Bromberger JT, Thurston RC, Lewis TT, Khalil N, Matthews KA. **Mood Symptoms After Natural Menopause and Hysterectomy with and without Bilateral Oophorectomy Among Women in Midlife.** Obstetrics & Gynecology. 2012;119(5):935-941.
Primary Question:
Summary of Findings: Midlife women experience a decline in depressive and anxiety symptoms in the years following natural menopause and hysterectomy with or without bilateral oophorectomy. Depressive symptoms also decline similarly in the years leading up to natural menopause or surgery. No differences were seen in the trajectory of mood scores between women who experience natural menopause, hysterectomy with ovarian conservation, or hysterectomy with bilateral oophorectomy.
[WG#600]

397 Lanza di Scalea T, Bromberger JT, Brown C, Avis NE, Thurston RC, Harlow S, Matthews KA. **Role Stress, Role Reward, and Mental Health in a Multiethnic Sample of Midlife Women:Results from the Study of Women's Health Across the Nation (SWAN).** Journal of Women's Health. 2012;21(5):481-489.
Primary Question:
Summary of Findings: Reward across roles buffered the negative impact of stress across roles on poor social functioning.
High reward experienced in being a Mother or Married decreased the negative effect of high stress in the same roles on at least one aspect of mental health.
Compared to Caucasians, minority women (Hispanic and Chinese) were less affected by overall high role stress in their social functioning, and African American Mothers were less likely to report depressive symptoms.
[WG#492]

398 Joffe H, Chang Y, Dhaliwal S, Hess R, Thurston R, Gold E, Matthews KA, Bromberger JT. **Lifetime History of Depression and Anxiety Disorders as a Predictor of Quality of Life in Midlife Women in the Absence of Current Illness Episodes.** Archives of General Psychiatry. 2012;2;69(5):484-492.
Primary Question:
Summary of Findings: Midlife women with a previous history of both a depression and an anxiety disorder have the greatest likelihood of experiencing reduced quality-of-life during the menopause transition, even when they are not currently depressed or anxious. While women with depression/anxiety are more likely to experience menopause-related symptoms of hot flashes and sleep disturbance during the menopause transition, hot flashes and sleep disturbance do not explain why these women have reduced quality-of-life. Sleep disturbance has a strong effect on reducing quality-of-life, and explains in part why women with prior depression only are also susceptible to experiencing compromised quality-of-life during the menopause transition.
[WG#340]

399 Ishii S, Cauley JA, Greendale GA, Danielson ME, Safaei Nili N, Karlamangla A. **Ethnic Differences in Composite Indices of Femoral Neck Strength.** Osteoporosis International. 2012;23(4):1381-1390.
Primary Question:
Summary of Findings: Unadjusted indices were similar in Caucasian and African-American women but higher in Chinese and Japanese women. After adjusting for age and menopause status, all three minority groups had higher composite strength indices than Caucasian women.
[WG#488]

400 Thurston RC, El Khoudary SR, Sutton-Tyrrell K, Crandall CJ, Gold EB, Sternfeld B, Joffe H, Selzer F, Matthews KA. **Vasomotor Symptoms and Lipid Profiles in Women Transitioning Through Menopause.** Obstetrics & Gynecology. 2012;119(4):753-761.
Primary Question:
Summary of Findings: We found hot flash reporting to be associated with adverse changes in inflammatory and hemostatic markers. In the case of two key hemostatic markers, Factor VIIc and TPA-antigen, these associations persisted controlling for cardiovascular risk factors and estradiol concentrations.
[WG#461D]

401 Lewis TT, Yang FM, Jacobs EA, Fitchett G. **Racial/Ethnic Differences in Responses to the Everyday Discrimination Scale: A Differential Item Functioning Analysis.** American Journal of Epidemiology. 2012; 175(5):391-401.
Primary Question:
Summary of Findings: Three out of 10 items on the everyday discrimination scale differ by race/ethnicity: "receiving poorer service in restaurants or stores", "being treated as if you are dishonest" and "being treated with less courtesy than other people" (all p-values <.001). Findings suggest that the profile of everyday discrimination may differ slightly for women of different racial/ethnic groups, with "public" experiences appearing to have more salience for African-American and Chinese women, and "dishonesty" having more salience for racial/ethnic minority women overall. "Courtesy" appears to have more salience for Hispanic women only compared to African-American women.
[WG#320]

402 Zheng H, Sowers MF, Buysse DJ, Consens F, Kravitz HM, Matthews KA, Owens JF, Gold EB, Hall MH. **Sources of Variability in Epidemiological Studies of Sleep Using Repeated Nights of In-Home Polysomnography: SWAN Sleep Study.** Journal of Clinical Sleep Medicine. 2012; 8(1):87–96.
Primary Question:
Summary of Findings: There was evidence of significant night-to-night variability, though relatively modest, based on 3 nights of in-home sleep measures when Night 1 included additional instrumentation to assess respiration and limb movement whereas Nights 2 and 3 included a sleep staging montage. When resources are constrained, 2 nights of in-home sleep assessment with an appropriate sample size can provide robust parameter estimates of sleep. In addition to type of instrumentation, personal characteristics likely to increase variability between nights include smoking, obesity and financial strain.
[WG#441]

403 Janssen I, Powell LH, Jasielec MS, Matthews KA, Hollenberg SM, Sutton-Tyrrell K, Everson-Rose SA. **Progression of Coronary Artery Calcification in Black and White Women: Do the Stresses and Rewards of Multiple Roles Matter?** Annals of Behavioral Medicine. 2012; 43(1):39-49
Primary Question:
Summary of Findings: For middle-aged women going through menopause, involvement in rewarding multiple roles decreases the risk of worsening coronary calcium, an early indicator of heart disease development. This increase in risk is similar in magnitude to the increase in risk associated with higher age or higher BMI.
[WG#523]

404 Woodard GA, Narla VV, Ye R, Cauley JA, Thompson T, Matthews KA, Sutton-Tyrrell K. **Racial Differences in the Association Between Carotid Plaque and Aortic and Coronary Artery Calcification Among Women Transitioning through Menopause.** Menopause. 2012 Feb; 19(2): 157-163.
Primary Question:
Summary of Findings: For the total cohort, higher prevalence of plaque was associated with higher levels of AC and CAC, and this association was significant for AC. After stratifying by race, clear differences were observed. Among African-Americans, there was no relationship between carotid plaque and AC, and a trend of a negative association between carotid plaque and CAC. In contrast, for Caucasians, there were significant positive relationships between carotid plaque and both AC and CAC. The interaction of carotid plaque by race was significant for predicting both AC and CAC (p=0.03, 0.002).
[WG#401]

405 Ishii S, Cauley JA, Crandall CJ, Srikanthan P, Greendale GA, Huang MH, Danielson ME, Karlamangla AS. **Diabetes and Femoral Neck Strength: Findings from The Hip Strength Across the Menopausal Transition Study.** Journal of Clinical Endocrinology and Metabolism. 2012;97(1):190-197.
Primary Question:
Summary of Findings: We found that diabetic women have lower femoral neck strength relative to the loads they bear despite having higher bone mineral density, consistent with the documented higher rates of fracture in diabetic women. Insulin resistance appears to play an important role in the reduction in bone strength in diabetics.
[WG#594]

406 Greendale GA, Sowers M, Han W, Huang M, Finkelstein JS, Crandall CJ, Lee JS, Karlamangla AS. **Bone Mineral Density Loss in Relation to the Final Menstrual Period in a Multiethnic Cohort: Results From the Study of Women's Health Across the Nation (SWAN).** Journal of Bone and Mineral Research. 2012; 27(1):111-118.
Primary Question:
Summary of Findings: There is a period of rapid bone loss that starts about one year before the final menstrual period (FMP) and the bone loss is greatest between 1 year before FMP and 2 years after FMP regardless of ethnicity and body mass. The 10-year cumulative BMD loss in Caucasian women is 10.6% at lumbar spine and 9.1% at femoral neck. The amount of 10-year loss is slightly less in African-American women and slightly more in Chinese and Japanese women.
[WG#552]

407 Huang M, Norris J, Han W, Block T, Gold E, Crawford S, Greendale GA. **Development of an Updated Phytoestrogen Database for Use With the SWAN Food Frequency Questionnaire: Intakes and Food Sources in a Community-Based, Multiethnic Cohort Study.** Nutrition and Cancer. 2012;64(2):228-244.
Primary Question:
Summary of Findings: The expanded database included 4 isoflavones, coumsterol and 4 lignans. The new database estimated isoflavone content of 125 food items (41.8%) versus 14 (4.7%) in the 1994 version and computed coumestrol content of 55 food items (18.4%), compared to 1 (0.3%) in the original version. Newly added were lignans; values for 111 FFQ food items (37.1%) were calculated. We also reported the phytonutrient intakes for each racial and language group in the SWAN sample and identified major food sources from which the phytonutrients came.
[WG#553]

408 Gibson CJ, Thurston RC, Bromberger JT, Kamarck T, Matthews KA. **Negative Affect and Vasomotor Symptoms in the Study of Women's Health Across the Nation (SWAN) Daily Hormone Study.** Menopause. 2011;18(12):1270-1277.
Primary Question:
Summary of Findings: Negative mood and hot flashes are associated when both are measured on a daily basis. Negative mood does not predict next day hot flashes, but hot flashes do predict next day negative mood.
[WG#543]

409 Janssen I, Powell LH, Wildman RP. **Moderate Wine Consumption Inhibits the Development of the Metabolic Syndrome: The Study of Women's Health Across the Nation (SWAN).** Journal of Wine Research. 2011;22(2):113-117.
Primary Question:
Summary of Findings: In this longitudinal study, moderate wine consumption (1 glass/day) was associated with lower odds of developing the MetS in midlife women, mainly through the beneficial association between wine consumption and HDL cholesterol and triglycerides, consistent with the literature.(Baer 2002, Opie (2007) Our findings of no relationship of wine consumption with glucose levels are similar to results from large cross-sectional studies.(Djousse 2004) Blood pressure was higher only in women who consumed more than 1 glass of wine per day, consistent with findings from intervention studies.(Leighton 2007) The finding that waist circumference was higher in African American women but lower in Caucasian women who drank 1 glass of wine per day may indicate different drinking patterns in the two groups. Therefore, using a rigorous longitudinal design, the current study supports the hypothesis that moderate wine consumption is good for cardiovascular health.
[WG#406C]

410 Waetjen LE, Johnson WO, Xing G, Feng WY, Greendale GA, Gold EB. **Serum Estradiol Levels Are Not Associated with Urinary Incontinence in Midlife Women Transitioning through Menopause.** Menopause. 2011;18(12):1283-1290.
Primary Question:
Summary of Findings: We found that annually measured values and year to year changes in estrogen (estradiol) levels had no significant relation to the development or worsening of urinary incontinence in mid-life women transitioning through menopause.

[WG#342]

411 Woodard GA, Mehta VG, Mackey RH, Tepper P, Kelsey SF, Newman AB, Sutton-Tyrrell K. **C-reactive Protein is Associated with Aortic Stiffness in a Cohort of African American and White Women Transitioning through Menopause.** Menopause. 2011;18(12):1291-1297.
Primary Question:
Summary of Findings: Higher levels of CRP were associated with higher levels of aortic pulse wave velocity even after adjustment for confounders. The association between CRP and pulse wave velocity was stronger in women who were later in their menopausal transition than women who were earlier in their transition.
[WG#284]

412 Karmon A, Hailpern SM, Neal-Perry G, Green RR, Santoro N, Polotsky AJ. **Association of Ethnicity with Involuntary Childlessness and Perceived Reasons for Infertility: Baseline Data from the Study of Women's Health Across the Nation (SWAN).** Fertility and Sterility. 2011;96(5):1200-1205.e1.
Primary Question:
Summary of Findings: After controlling for socio-economic factors and other confounders, African-American and Chinese women were significantly less likely to suffer from involuntary childlessness as compared to non-Hispanic Caucasian women. 302 subjects reported a perceived etiology of infertility. An unexpectedly large proportion of these women (24.5%, 74 out of 302) reported etiologies not known to cause infertility, with African-American women having been most likely to report these etiologies as the reason for not becoming pregnant.
[WG#404]

413 Campbell IG, Bromberger JT, Buysse DJ, Hall MH, Hardin KA, Kravitz HM, Matthews KA, Rasor MO, Utts J, Gold E. **Evaluation of the Association of Menopausal Status with Delta and Beta EEG Activity during Sleep.** Sleep. 2011;34(11):1561-1568.
Primary Question:
Summary of Findings: Beta EEG power in NREM and REM sleep was higher in late perimenopausal and post menopausal women than in pre- and early perimenopausal women. Delta power did not differ by menopausal status. Elevated beta EEG power provides an objective measure of disturbed sleep quality in menopausal women and may be related to elevated arousal level during sleep.
[WG#409]

414 McClure CK, Schwarz EB, Conroy MB, Tepper PG, Janssen I, Sutton-Tyrrell KC. **Breastfeeding and Subsequent Maternal Visceral Adiposity.** Obesity. 2011;19(11):2205-2213.
Primary Question:
Summary of Findings: Mothers who did not consistently breastfeed were significantly more likely to retain abdominal fat than mothers who consistently breastfed.
[WG#511]

415 Conroy SM, Butler LM, Harvey D, Gold EB, Sternfeld B, Greendale GA, Habel LA. **Metabolic Syndrome and Mammographic Density: The Study of Women's Health Across the**

Nation (SWAN). International Journal of Cancer. 2011;129(7):1699-1707.
Primary Question:
Summary of Findings: Women with the MetS and/or insulin resistance did not have higher percent MD compared to women without these conditions. Our results do not support the hypothesis that the MetS and/or insulin resistance affect breast cancer risk via a mechanism reflected by percent MD or dense breast tissue area.
[WG#481]

416 Thurston RC, El Khoudary SR, Sutton-Tyrrell K, Crandall CJ, Gold E, Sternfeld B, Selzer F, Matthews KA. **Are vasomotor symptoms associated with alterations in hemostatic and inflammatory markers? Findings from the Study of Women's Health Across the Nation.** Menopause. 2011;18(10):1044-1051.
Primary Question:
Summary of Findings: We found hot flash reporting to be associated with adverse changes in inflammatory and hemostatic markers. In the case of two key hemostatic markers, Factor VIIc and TPA-antigen, these associations persisted controlling for cardiovascular risk factors and estradiol concentrations.
[WG#461]

417 Thurston RC, Santoro N, Matthews KA. **Adiposity and Hot Flashes in Midlife Women: A Modifying Role of Age.** Journal of Clinical Endocrinology and Metabolism. 2011;96(10):E1588-E1595.
Primary Question:
Summary of Findings: Larger body size/higher body fat was associated with fewer physiologically monitored hot flashes among the older women in the sample with hot flashes.
[WG#563]

418 Avis NE, Green R. **The Perimenopause and Sexual Functioning.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):587-594.
Primary Question:
Summary of Findings:
[WG#567]

419 Kravitz HM, Joffe H. **Sleep During the Perimenopause: A SWAN Story.** Obstet Gynecol Clin North Am. Obstet Gynecol Clin North Am. 2011 Sep;38(3):567-86. doi: 10.1016/j.ogc.2011.06.002.
Primary Question:
Summary of Findings:
[WG#569]

420 Gold EB. **The Timing of the Age at Which Natural Menopause Occurs.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):425-440.
Primary Question:
Summary of Findings:
[WG#583]

421 Lo JC, Burnett-Bowie SA, Finkelstein JS. **Bone and the Perimenopause.** Obstetrics and

Gynecology Clinics of North America. 2011;38(3):503-517.
Primary Question:
Summary of Findings:
[WG#627]

422 Greendale GA, Derby CA, Maki PM. **Perimenopause and Cognition.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):519-535.
Primary Question:
Summary of Findings:
[WG#581]

423 Santoro N, Sutton-Tyrrell K. **The SWAN Song: Study of Women's Health Across the Nation's Recurring Themes.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):417-423.
Primary Question:
Summary of Findings:
[WG#580]

424 Santoro N, Randolph JF Jr. **Reproductive Hormones and the Menopause Transition.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):455-466.
Primary Question:
Summary of Findings:
[WG#579]

425 Bromberger JT, Kravitz HM. **Mood and Menopause: Findings from the Study of Women's Health Across the Nation (SWAN) over 10 Years.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):609-625.
Primary Question:
Summary of Findings:
[WG#572]

426 Sternfeld B, Dugan S. **Physical Activity and Health During the Menopausal Transition.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):537-566.
Primary Question:
Summary of Findings:
[WG#586]

427 Harlow SD, Paramsothy P. **Menstruation and the Menopausal Transition.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):595-607.
Primary Question:
Summary of Findings:
[WG#597]

428 Chae CU, Derby CA. **The menopausal transition and cardiovascular risk.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):477-488.
Primary Question:
Summary of Findings:

[WG#587]

429 Wildman RP, Sowers MR. **Adiposity and the menopausal transition.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):441-454.
Primary Question:
Summary of Findings:
[WG#573]

430 Lasley BL, Crawford S, McConnell DS. **Adrenal Androgens and the Menopausal Transition.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):467-475.
Primary Question:
Summary of Findings:
[WG#585]

431 Thurston RC, Joffe H. **Vasomotor Symptoms and Menopause: Findings from the Study of Women's Health across the Nation.** Obstetrics and Gynecology Clinics of North America. 2011;38(3):489-501.
Primary Question:
Summary of Findings:
[WG#590]

432 Kravitz HM, Avery E, Sowers M, Bromberger JT, Owens JF, Matthews KA, Hall M, Zheng H, Gold EB, Buysse DJ. **Relationships between Menopausal and Mood Symptoms and EEG Sleep Measures in a Multi-ethnic Sample of Middle-Aged Women: The SWAN Sleep Study.** Sleep. 2011;34(9):1221-1232.
Primary Question:
Summary of Findings: We found limited evidence for associations between EEG sleep measures and nocturnal VMS or symptoms of depression or anxiety. EEG sleep measures were largely not associated with VMS and mood symptoms across all racial/ethnic groups, although having more frequent nocturnal VMS was associated with longer sleep time. In Caucasians, DSR was higher in women with more frequent nocturnal VMS and with higher depressive symptom scores, while REM latency was longer in women with higher depressive and anxiety symptom scores. Chinese women with higher anxiety symptom scores had shorter sleep latency. Significant racial/ethnic effects did not persist in all fully adjusted models and were not consistently in the expected direction. Antidepressant medication use was a significant covariate in adjusted models for DSR, REM latency and sleep latency. Thus, characteristics of sleep determined by EEG measures seem to be largely independent of these symptoms.
[WG#367]

433 Bromberger JT, Kravitz HM, Chang YF, Cyranowski JM, Brown C, Matthews KA. **Major depression during and after the menopausal transition: Study of Women's Health Across the Nation (SWAN)** Psychol Med Psychol Med. 2011 Sep;41(9):1879-88. doi: 10.1017/S003329171100016X. Epub 2011 Feb 9
Primary Question:
Summary of Findings: The risk of a major depressive episode for women during and immediately after the menopausal transition is about two to four times as great as when they

are premenopausal. However, it appears that the increased risk is likely experienced only by a subset of women. Many questions remain about the cause of major depression during this time and the contributions of alterations of the hormonal conditions and other unmeasured factors.
[WG#362]

434 Zheng H, Sowers MF, Harlow S, Randolph J. **An Integrated Quantitative Methodology to Longitudinally Characterize Complex Dynamic Processes Associated with Ovarian Aging and the Menopausal Transition.** The Journal on Systemics, Cybernetics and Informatics (JSCI). 2011;9(3):15-23.
Primary Question:
Summary of Findings: An integrative methodology is developed to characterize the complex patterns of change in highly variable dynamic biological processes. The method permits estimatation of the population mean profile, multiple change points and length of time-windows defined by any two change points of interest using a semi-/non-parametric stochastic mixed effect model and a Bayesian Modeling Average (BMA) approach to account for model uncertainty. It also allows estimation of the mean rate of change of sub-processes by fitting piecewise linear mixed effect models. The methodology is applied to characterize the stages of female ovarian aging and the menopausal transition defined by hormone measures of estradiol (E2) and follicle stimulating hormone (FSH) from two large-scale epidemiological studies with community-based longitudinal designs and ethnic diversity.
[WG#531B]

435 El Khoudary SR, Wildman RP, Matthews K, Powell L, Hollenberg SM, Edmundowicz D, Sutton-Tyrrell K. **Effect Modification of Obesity on Associations Between Endogenous Steroid Sex Hormones and Arterial Calcification in Women at Midlife.** Menopause. 2011;18(8):906-914.
Primary Question:
Summary of Findings: SHBG and FAI are associated with arterial calacification. Obesity status influences the role that SHBG and FAI play in calcification of the coronary arteries and aorta of perimenopausal women. In non-obese women, higher SHBG and lower FAI were associated with greater extent of CAC while lower SHBG was associated with greater extent of CAC in obese women.
[WG#317]

436 Birru MS, Matthews KA, Thurston RC, Brooks MM, Ibrahim S, Barinas-Mitchell E, Janssen I, Sutton-Tyrrell K; SWAN Heart Study. **African-American ethnicity and cardiovascular risk factors are related to aortic pulse-wave velocity progression.** American Journal of Hypertension. 2011;24(7):809-815.
Primary Question:
Summary of Findings: SBP and waist circumference were most strongly related to PWV progression than were DBP, triglycerides, LDL-C, HDL-C, and glucose in the total sample of SWAN Heart women. SBP was more strongly associated with PWV progression among African Americans than among Caucasians; in addition, DBP, LDL-C, and to a lesser extent,

glucose levels, were all associated with PWV progression among African Americans only. [WG#499]

437 Janssen I, Powell LH, Matthews KA, Cursio JF, Hollenberg SM, Sutton-Tyrrell K, Bromberger JT, Everson-Rose SA. **Depressive symptoms are related to progression of coronary calcium in midlife women: The Study of Women's Health Across the Nation (SWAN) Heart Study.** American Heart Journal. 2011;16(6):1186-1191.
Primary Question:
Summary of Findings: For middle-aged women going through menopause, depression increases the risk of worsening coronary calcium, an early indicator of heart disease development. This increase in risk is similar to the increase in risk associated with higher BMI or higher blood pressure.
[WG#518]

438 Lewis TT, Kravitz HM, Janssen I, Dugan S, Powell LH. **Self-Reported Experiences of Discrimination and Visceral Fat in Middle-aged African-American and Caucasian Women.** American Journal of Epidemiology. 2011;173(11):1223-1231.
Primary Question:
Summary of Findings: Higher reports of discrimination are associated with a greater amount of fat around the internal organs in middle-aged African-American and White women. Reports of discrimination were not associated with other types of fat surrounding the waist.
[WG#516]

439 Gibson CJ, Bromberger JT, Weiss GE, Thurston RC, Sowers M, Matthews KA. **Negative attitudes and affect do not predict elective hysterectomy: a prospective analysis from the Study of Women's Health Across the Nation.** Menopause. 2011;18(5):499-507.
Primary Question:
Summary of Findings: After taking known risk factors into account, negative attitudes toward aging and menopause, negative affect, and PMS-like symptoms do not predict elective hysterectomy. However, hot flashes/night sweats in early menopause do predict elective hysterectomy over the menopausal transition.
[WG#493]

440 Lasley BL, Crawford SL, Laughlin GA, Santoro N, McConnell DS, Crandall C, Greendale GA, Polotsky AJ, Vuga M. **Circulating dehydroepiandrosterone sulfate levels in women who underwent bilateral salphingo-oophorectomy during the menopausal transition.** Menopause. 2011;18(5):494-498.
Primary Question:
Summary of Findings: The ovaries are not required.
[WG#510]

441 Khalil N, Sutton-Tyrrell K, Strotmeyer ES, Greendale GA, Vuga M, Selzer F, Crandall C, Cauley JA. **Menopausal bone changes and incident fractures diabetic women: a cohort study.** Osteoporosis International. 2011;22(5):1367-1376.
Primary Question:
Summary of Findings: The study provides evidence that despite higher BMD at baseline, women with DM experience greater annual average rate of hip bone loss and a higher

fracture risk during the menopausal transition.
[WG#456]

442 Sowers MR, Randolph JF, Zheng H, Jannausch M, McConnell D, Kardia SR, Crandall CJ, Nan B. **Genetic polymorphisms and obesity influence estradiol decline during the menopause.** Clinical Endocrinology. 2011;74(5):618-623.
Primary Question:
Summary of Findings: Obesity and CYP19 and 17-â HSD genes variants influenced rates of E2 decline at the FMP leading to subgroups of postmenopausal women with marked differences in E2 levels. This may have implications for differential postmenopausal bone loss or risk for estrogen-sensitive chronic diseases.
[WG#495]

443 Reeves KW, Stone RA, Modugno F, Ness RB, Vogel VG, Weissfeld JL, Habel L, Vuga M, Cauley JA. **A method to estimate off-schedule observations in a longitudinal study.** Annals of Epidemiology. 2011;21(4):297-303.
Primary Question:
Summary of Findings: Data collected from outside sources can be used to estimate values for missing data at the time of the study visits. Our estimation approach is based on linear interpolation, with the addition of multiply imputed noise terms to account for the fact that data are estimated rather than observed. We show that this approach is unbiased, on average, and that the interpretation of results is affected by the approach used to estimate missing data.
[WG#381A]

444 Woodard GA, Brooks MM, Barinas-Mitchell E, Mackey RH, Matthews KA, Sutton-Tyrrell K. **Lipids, menopause, and early atherosclerosis in Study of Women's Health Across the Nation Heart women.** Menopause. 2011;18(4):376-384.
Primary Question:
Summary of Findings: The protective effect of HDL-c is reduced among postmenopausal women.
[WG#430]

445 Crandall CJ, Tseng CH, Crawford SL, Thurston RC, Gold EB, Johnston JM, Greendale GA. **Association of menopausal vasomotor symptoms with increased bone turnover during the menopausal transition.** Journal of Bone and Mineral Research. 2011;26(4):840-849.
Primary Question:
Summary of Findings: Perimenopausal women with menopausal hot flashes had higher levels of Ntx, a marker of bone turnover, than perimenopausal women without menopausal hot flashes.
[WG#457]

446 Wildman RP, Janssen I, Khan U, Thurston R, Barinas-Mitchell E, El Khoudary SR, Everson-Rose SA, Kazlauskaite R, Matthews KA, Sutton-Tyrrell K. **Subcutaneous adipose tissue in relation to subclinical atherosclerosis and cardiometabolic risk factors in midlife women.** American Journal of Clinical Nutrition. 2011;93(4):719-726.
Primary Question:

Summary of Findings: Higher levels of abdominal subcutaneous adipose tissue are associated with less favorable cardiometabolic risk factor levels and with a greater burden of subclinical atherosclerosis. However, among African American but not Caucasian women, these adverse associations are attenuated or reversed when in the presence of high levels of abdominal visceral adipose tissue.
[WG#538]

447 Thurston RC, Sutton-Tyrrell K, Everson-Rose SA, Hess R, Powell LH, Matthews KA. **Hot Flashes and Carotid Intima Media Thickness among Midlife Women.** Menopause. 2011;18(4):352-358.
Primary Question:
Summary of Findings: Hot flashes were associated with higher intima media thickness. This association was not fully accounted for by cardiovascular risk factors nor estradiol concentrations. This associations were most pronounced among overweight and obese women.
[WG#445]

448 Randolph JF Jr, Zheng H, Sowers MR, Crandall C, Crawford S, Gold EB, Vuga M. **Change in follicle-stimulating hormone and estradiol across the menopausal transition: effect of age at the final menstrual period.** Journal of Clinical Endocrinology and Metabolism. 2011;96(3):746-754.
Primary Question:
Summary of Findings: The endocrinologic patterns and timespans associated with the marked hormone changes of late ovarian aging are relatively consistent, regardless of the chronologic age at which the FMP occurs. Moreover, while obesity, race/ethnicity, and smoking were associated with some differences in absolute serum concentrations of reproductive hormones, they were not associated with variation in the overall patterns and timespans of late ovarian aging.
[WG#440]

449 Sowers M, Karvonen-Gutierrez CA, Jacobson JA, Jiang Y, Yosef M. **Associations of Anatomical Measures from MRI with Radiographically Defined Knee Osteoarthritis Score, Pain, and Physical Functioning.** Journal of Bone and Joint Surgery. 2011;93(3):241-251.
Primary Question:
Summary of Findings: The prevalence of knee OA (K-L scores > 2) changed from 18.1% at the 1996/7 baseline to 62.4% at the 2007/8 follow-up; the prevalence of moderate to severe knee OA (K-L scores of 3-4) changed from 3.7% to 26.7% in the same time period.

Full-thickness cartilage defects were present in 14.6%, 4.6% and 26.3% of medial, lateral, and patellofemoral compartments, respectively. MR-defined synovitis occurred in 24.7% of knees; in 6.2% of knees, synovitis was moderate to marked. Joint effusions were observed in 70% of knees. Complex or macerated meniscal tears were present in 21.8% of knees. Walking and stair climbing times were 30-40% slower in women with large osteophytes, synovitis, macerated meniscal tears, or full-thickness cartilage defects. In middle-aged women, there is a high prevalence of radiographically-defined knee OA corroborated by significant associations with cartilage defects, complex and macerated meniscal tears, osteophytes and synovitis, knee pain, and lower mobility levels.

[WG#496]

450 Khan UI, Wang D, Thurston RC, Sowers M, Sutton-Tyrrell K, Matthews KA, Barinas-Mitchell E, Wildman RR. **Burden of subclinical cardiovascular disease in "metabolically benign" and "at-risk" overweight and obese women: the Study of Women's Health Across the Nation (SWAN).** Atherosclerosis. 2011;217(1):179-186.
Primary Question:
Summary of Findings: Despite published data indicating a similar 3-11 year CVD event rate among obese individuals with healthy cardiometabolic profiles and normal weight individuals, midlife overweight/obese women with healthy cardiometabolic profiles participating in SWAN have an intermediate burden of subclinical cardiovascular disease, with significantly higher subclinical disease levels compared to healthy normal weight women and borderline significantly lower levels of subclinical disease compared to at-risk overweight/obese women.
[WG#435]

451 Derby CA, Wildman RP, McGinn AP, Green RR, Polotsky AJ, Ram KT, Bamhart J, Weiss G, Santoro N. **Cardiovascular Risk Factor Variation within a Hispanic Cohort: SWAN, the Study of Women's Health Across the Nation.** Ethnicity & Disease. 2010;20(4):396-402.
Primary Question:
Summary of Findings: There is significant variation in cardiovascular risk status among middle-aged Puerto Rican, Cuban, Dominican, Central American and South American women, not explained by acculturation or socioeconomic indicators. These differences may be important for targeting screening and preventive interventions.
[WG#427]

452 Green R, Santoro NF, McGinn AP, Wildman RP, Derby CA, Polotsky AJ, Weiss G. **The Relationship between Psychosocial Status, Acculturation and Country of Origin in Mid-life Hispanic Women: Data from the Study of Women's Health Across the Nation.** Climacteric. 2010;13(6):534-543.
Primary Question:
Summary of Findings: Puerto Rican women have more depressive symptoms, poorer physical functioning, more sleep problems, and anxiety compared to the other Hispanic subethnicities.
[WG#428]

453 Matthews KA, Zheng H, Kravitz HM, Sowers M, Bromberger JT, Buysse DJ, Owens JF, Sanders M, Hall M. **Are Inflammatory and Coagulation Biomarkers Related to Sleep Characteristics in Mid-Life Women?: Study of Women's Health Across the Nation Sleep Study.** Sleep. 2010;33(12):1649-1655.
Primary Question:
Summary of Findings: Indices of sleep disordered breathing are associated with each of the biomarkers of inflammation and coagulation in the full sample. African Americans who are short and/or inefficient sleepers have higher levels of CRP, fibrinogen, and PAI-1 in full multivariate models.
[WG#417]

454 Knight JM, Avery EF, Janssen I, Powell LH. **Cortisol and Depressive Symptoms in a Population-Based Cohort of Midlife Women.** Psychosomatic Medicine. 2010;72(9):855-861.
Primary Question:
Summary of Findings: Midlife women from a population-based sample with higher CES-D scores have significantly flatter diurnal cortisol slope than those with lower scores, even after adjusting for covariates and possibly contaminating behaviors.
[WG#489]

455 Matthews KA, Chang YF, Sutton-Tyrrell K, Edmundowicz D, Bromberger JT. **Recurrent Major Depression Predicts Progression of Coronary Calcification in Healthy Women: Study of Women's Health across the Nation.** Psychosomatic Medicine. 2010;72(8):742-747.
Primary Question:
Summary of Findings: Healthy women with a history of at least 2 episodes of major depression show greater progression across a 2 ¼ follow-up period compared to women who have 1 or no episodes. The effect was only obtained in those with any calcification at baseline. Other important predictors of progression were initial calcification, body mass index, and systolic blood pressure.
[WG#434]

456 Green R, Polotsky AJ, Wildman RP, McGinn AP, Lin J, Derby C, Johnston J, Ram KT, Crandall CJ, Thurston R, Gold E, Weiss G, Santoro N. **Menopausal symptoms within a Hispanic cohort: SWAN, the Study of Women's Health Across the Nation.** Climacteric. 2010;13(4):376-384.
Primary Question:
Summary of Findings: Reporting of symptoms associated with menopause among Hispanic women differed by county of origin but not acculturation. Central American women appear to be at greatest risk for both Vasomotor Symptoms (VMS) and vaginal dryness.
[WG#429]

457 Tomey K, Sowers MR, Harlow S, Jannausch M, Zheng H, Bromberger J. **Physical functioning among mid-life women: Associations with trajectory of depressive symptoms.** Social Science and Medicine. 2010;71(7):1259-1267.
Primary Question:
Summary of Findings: Higher concurrent depressive symptom scores were significantly related to several performance-based functions including slower timed walk, lower walking velocities and chair rise, as well as lower leg strength, slower 2-lb lift, and slower stair climb after adjusting for relevant covariates. Persistent depressive symptoms were related to slower 2-lb lift, velocity, and sit-to-stand compared to those did not report depressive symptoms at any time point. Those with higher concurrent depressive scores and those reporting depressive symptoms at >3 time points were significantly more likely to have perceived limitations in physical functioning.
[WG#466]

458 Palmieri-Smith RM, Thomas AC, Karvonen-Gutierrez C, Sowers M. **Isometric Quadriceps Strength in Women with Mild, Moderate, and Severe Knee Osteoarthritis.** American Journal of Physical Medicine & Rehabilitation. 2010;89(7):541-548.

Primary Question:
Summary of Findings: Women with radiographic evidence of knee osteoarthritis were 22% stronger that women without knee osteoarthritis. Quadriceps strength was also greater in women without cartilaginous defects on the medial tibia, femur, and patella when compared with women with cartilaginous defects in these regions.
[WG#500]

459 Troxel WM, Buysse DJ, Matthews KA, Kravitz HM, Bromberger JT, Sowers M, Hall MH. **Marital/ Cohabitation Status and History in Relation to Sleep in Midlife Women.** Sleep. 2010;33(7):973-981.
Primary Question:
Summary of Findings: Women who were married at the time of the sleep study had better sleep quality and better sleep continuity than unmarried women. However, most of these associations were reduced to non-significance when accounting for other known risk factors for sleep disturbance. Analyses of women's marital histories revealed that women who were consistently married throughout the study follow-up had better sleep quality and continuity than women who were consistently unmarried or those who had lost a partner. These differences generally persisted even after covariate adjustment. Women who gained a partner over the course of the study were similar to the consistently married group for most sleep outcomes. However, they had poorer actigraphy-assessed sleep fragmentation, which may reflect an acclimation period of adjusting to a new relationship.
[WG#462]

460 Dugan SA, Everson-Rose SA, Karavolos K, Avery EF, Wesley DE, Powell LH. **Physical Activity and Reduced Intra-abdominal Fat in Midlife African-American and White Women.** Obesity. 2010;18(6):1260-1265.
Primary Question:
Summary of Findings: Higher levels of physical activity were associated with lower levels of IAF, the fat that surrounds the organs deep in the addomen. This fat has been associated with diabetes and heart disease. Motivating white and black women to increase their physical activity during their middle years may lessen intra-abdominal fat which may impact positively on diabetes and cardiovascular risk profiles.
[WG#392]

461 Sutton-Tyrrell K, Zhao X, Santoro N, Lasley B, Sowers M, Johnston J, Mackey R, Matthews K. **Reproductive Hormones and Obesity: 9 years of Observation from the Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2010;171(11):1203-1213.
Primary Question:
Summary of Findings: Hormones, specifically lower SHBG and higher androgens predict obesity in women transitioning the menopause. Among women undergoing a natural transition, bleeding patterns were not related to obesity. However, women undergoing surgical menopause and women who initiated HT prior to their final period were at increased risk for obesity.
[WG#375A]

462 Bromberger JT, Schott LL, Kravitz HM, Sowers M, Avis NE, Gold EB, Randolph JF, Matthews KA. **Longitudinal Change in Reproductive Hormones and Depressive Symptoms**

Across the Menopausal Transition: Results from the Study of Women's Health across the Nation (SWAN). Archives of General Psychiatry. 2010;67(6):598-607.
Primary Question:
Summary of Findings: A woman in midlife is more likely to experience high levels of depressive symptoms when peri- or postmenopausal than when premenopausal. Current total testosterone and a smaller decrease in testosterone levels from baseline were associated with high depressive symptoms. Testosterone, menopausal status, and other health and lifestyle factors independently influence depressive symptoms in women during midlife.
[WG#222]

463 Greendale GA, Wight RG, Huang MH, Avis N, Gold EB, Joffe H, Seeman T, Vuga M, Karlamangla AS. **Menopause-associated Symptoms and Cognitive Performance: Results From the Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2010;171(11):1214-1224.
Primary Question:
Summary of Findings: Depressive and anxiety symptoms had a small negative effect on cognitive processing speed in our sample of mid-life women. However, the 4 symptoms studied—depressive, anxiety, sleep disturbance and vasomotor—did not account for the transient absence of SDMT learning observed during the late perimenopause in SWAN.
[WG#433]

464 Conroy SM, Butler LM, Harvey D, Gold EB, Sternfeld B, Oestreicher N, Greendale GA, Habel LA. **Physical Activity and Change in Mammographic Density: The Study of Women's Health Across the Nation (SWAN).** American Journal of Epidemiology. 2010;171(9):960-968.
Primary Question:
Summary of Findings: Higher levels of physical activity did not increase the observed decline with age in percent mammographic density. Our results do not support percent mammographic density being part of a pathway by which physical activity reduces breast cancer risk.
[WG#418]

465 Polotsky AJ, Halipern SM, Skurnick JH, Lo JC, Sternfeld B, Santoro N. **Association of adolescent obesity and lifetime nulliparity--The Study of Women's Health Across the Nation.** Fertility and Sterility. 2010;93(6):2004-2011.
Primary Question:
Summary of Findings: Women who were heavy adolescents have fewer children later in life than women who were not heavy.
[WG#388]

466 Ford K, Sowers M, Seeman TE, Greendale GA, Sternfeld B, Everson-Rose SA. **Cognitive Functioning is Related to Physical Functioning in a Longitudinal Study of Women at Midlife.** Gerontology. 2010;56(3):250-258.
Primary Question:
Summary of Findings: At the midlife, there were associated and parallel declines in both cognitive and physical functioning levels and their 4-year changes. These parallel declines were explained, in part, by socioeconomic status and metabolic syndrome status, after

adjusting for menstrual status and race/ethnicity.
[WG#270]

467 Neer RM. **Bone loss across the menopausal transition.** Annals of the New York Academy of Sciences. 2010;1192:66-71.
Primary Question:
Summary of Findings: 1. ethnic differences in pre-menopausal bone density and peri-menopausal bone loss are greatly affected by body weight
2. bone density of pre-menopausal and early peri-menopausal women is inversely correlated with blood levels of FSH, not blood levels of estrogen, when these are measured once-yearly on day 2-5 of the menstrual cycle
3. rates of bone loss in middle-aged women correlate with once-yearly measurements of blood FSH, not blood estrogen
4. middle-aged women do not lose significant bone until their menses become less frequent
5. at that time, bone loss is as rapid as during the years immediately after the final menses
[WG#514]

468 Janssen I, Powell LH, Kazlauskaite R, Dugan SA. **Testosterone and Visceral Fat in Midlife Women: The Study of Women's Health Across the Nation (SWAN) Fat Patterning Study.** Obesity. 2010;18(3):604-610.
Primary Question:
Summary of Findings: Women with higher levels of bio-available testosterone had more IAF, independent of age and other CVD risk factors, and also independent of physical activity levels. The relation is similar in black and white women. However, when black and white women with the same amount of total fat (or BMI) are compared, black women have significantly less intra-abdominal fat.
[WG#336]

469 Midei AJ, Matthews KA, Bromberger JT. **Childhood Abuse Is Associated With Adiposity In Midlife Women: Possible Pathways Through Trait Anger and Reproductive Hormones.** Psychosomatic Medicine. 2010;72(2):215-223.
Primary Question:
Summary of Findings: Physical abuse and sexual abuse are associated with obesity and central adiposity at baseline, and most subtypes of abuse/neglect are associated with changes in central adiposity for normal-weight and overweight women. Trait Anger and SHBG (sex hormone binding globulin) mediate cross-sectional relationships.
[WG#458]

470 Butler LM, Gold EB, Conroy SM, Crandall CJ, Greendale GA, Oestreicher N, Quesenberry CP Jr, Habel LA. **Active, but not passive cigarette smoking was inversely associated with mammographic density.** Cancer Causes & Control. 2010;21(2):301-311.
Primary Question:
Summary of Findings: We observed lower percent mammographic density among current smokers, those who started to smoke before age 18, and those who smoked 20 or more cigarettes per day, compared to never active smokers. Our data support an antiestrogenic hypothesis for the relation between smoking and breast cancer in pre-/early perimenopausal

women.
[WG#386]

471 Schwarz EB, McClure CK, Tepper PG, Thurston R, Janssen I, Matthews KA, Sutton-Tyrrell K. **Lactation and maternal measures of subclinical cardiovascular disease.** Obstetrics & Gynecology. 2010;115(1):41-48.
Primary Question:
Summary of Findings:
[WG#478]

472 Matthews KA, Schott LL, Bromberger JT, Cyranowski JM, Everson-Rose SA, Sowers M. **Are there bi-directional associations between depressive symptoms and C-reactive protein in mid-life women?** Brain, Behavior, and Immunity. 2010;24(1):96-101.
Primary Question:
Summary of Findings: The relationships between depressive symptoms and inflammation may be bi-directional. Depressive symptoms were related to subsequent inflammation and vice versa, but no associations were found for coagulation. The relationship between depressive symptoms and inflammation were most apparent in normal or overweight women, rather than obese women.
[WG#414]

473 Matthews KA, Crawford SL, Chae CU, Everson-Rose SA, Sowers MF, Sternfeld B, Sutton-Tyrrell K. **Are Changes in Cardiovascular Disease Risk Factors in Midlife Women Due to Chronological Aging or to the Menopausal Transition?** Journal of the American College of Cardiology. 2009;54(25):2366-2373.
Primary Question:
Summary of Findings: Total cholesterol, LDL-cholesterol, and apolipoprotein B increase substantially around the time of the final menstrual period. Other risk factors, including blood pressure, inflammatory and hemostatic factors, glucose and insulin, do not show a unique rise around the final menstrual period. The changes in lipids were similar across ethnic groups.
[WG#325]

474 Sowers MF, Karvonen-Gutierrez CA, Yosef M, Jannausch M, Jiang Y, Garnero P, Jacobson J. **Longitudinal changes of serum COMP and urinary CTX-II predict X-ray defined knee osteoarthritis severity and stiffness in women.** Osteoarthritis & Cartilage. 2009;17(12):1609-1614.
Primary Question:
Summary of Findings: The 2007 prevalence of x-ray defined knee osteoarthritis (OAK) was 50% in these 72 women. Upward trajectories of both cartilage oligomeric matrix protein (COMP) and cross-linked telopeptide of type II collagen (CTX-II) were associated with progression of OAK severity and body size. COMP trajectories were associated with pain and stiffness scores, but not functioning. CTX-II trajectories were associated with stiffness scores, but not knee pain or functioning scores. Multiple, biennial measures of COMP or CTX-II taken over a 10-year period are modestly predictive of subsequent OAK and stiffness in the knees
[WG#443]

475 Tomey K, Sowers M, Zheng H, Jackson EA. **Physical functioning related to C-reactive protein and fibrinogen levels in mid-life women.** Experimental Gerontology. 2009;44(12):799-804.
Primary Question:
Summary of Findings: Higher CRP was associated with worse perceived and performance-based physical functioning, including more time spent in double support, slower stair climb, shorter forward reach and slower 2-lb lift in concurrent and prospective analyses. Higher fibrinogen levels were associated with slower chair rise in concurrent analyses and shorter forward reach in concurrent and prospective analyses.
[WG#424]

476 Hu Y, Block G, Sternfeld B, Sowers M. **Dietary Glycemic Load, Glycemic Index, and Associated Factors in a Multiethnic Cohort of Midlife Women.** Journal of American College of Nutrition. 2009;28(6):636-647.
Primary Question:
Summary of Findings: Mean GI and GL were consistently lower in Caucasian women than African American, Japanese or Chinese women. Mean GI and GL values were inversely associated with education, income and sports activity, and positively associated with current smoking and consumption of more than 1 drink of alcohol per day. GI was positively associated with consumption of grains and potatoes and inversely associated with consumption of fruits, dairy foods, and sweets.
[WG#348]

477 Morelli SS, Lian Y, Schott LL, Weiss G. **Qualifications of Physicians Performing Hysterectomy: the Study of Women's Health Across the Nation.** Reproductive Sciences. 2009; http://rsx.sagepub.com/cgi/rapidpdf/1933719109351595v1.
Primary Question:
Summary of Findings: Ninety-eight percent of physicians performing hysterectomies on participants of SWAN are board certified physicians. Nearly all are board certified in Obstetrics and Gynecology via the American Board of Obstetrics and Gynecology. It thus appears that these physicians are appropriately trained to carry out this commonly performed procedure.
[WG#450]

478 Waetjen LE, Ye J, Feng W, Johnson WO, Greendale GA, Sampselle CM, Sternfeld B, Harlow SD, Gold EB. **Association Between Menopausal Transition Stages and Developing Urinary Incontinence.** Obstetrics and Gynecology. 2009;114(5):989-998.
Primary Question:
Summary of Findings: The menopausal transition appears to decrease the risk of developing urinary incontinence. Instead, aging, weight gain, diabetes, and smoking increase the risk.
[WG#248D]

479 Whipple MO, Lewis TT, Sutton-Tyrrell K, Matthews KA, Barinas-Mitchell E, Powell LH, Everson-Rose SA. **Hopelessness, Depressive Symptoms and Carotid Atherosclerosis in Women: The Study of Women's Health Across the Nation (SWAN) Heart Study.** Stroke. 2009;40(10):3166-3172.
Primary Question:

Summary of Findings: Higher levels of hopelessness are associated with greater atherosclerosis in women after taking into account age, race, blood pressure, obesity, smoking and depressive symptoms. In contrast, depressive symptoms are not related to atherosclerosis once the effects of hopelessness are considered. Relations do not differ for African American and white women.
[WG#395]

480 Lewis TT, Everson-Rose SA, Karavolos K, Janssen I, Wesley D, Powell LH. **Hostility Is Associated With Visceral, But Not Subcutaneous, Fat in Middle-Aged African American and White Women.** Psychosomatic Medicine. 2009;71(7):733-740.
Primary Question:
Summary of Findings: Hostility was associated with a greater amount of visceral, but not subcutaneous fat in African-American and Caucasian women. Although there were significant racial/ethnic differences in hostility (higher in African-American women), subcutaneous fat (higher in African-American women) and visceral fat (lower in African-American women), the observed associations did not differ by race/ethnicity.
[WG#339C]

481 Thurston RC, Sowers MR, Sternfeld B, Gold EB, Bromberger J, Chang Y, Joffe H, Crandall CJ, Waetjen LE, Matthews KA. **Gains in Body Fat and Vasomotor Symptom Reporting Over the Menopausal Transition The Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2009;170(6):766-774.
Primary Question:
Summary of Findings: Fat gain is associated with increased reporting of hot flashes over and above the previous years' hot flash reporting. Fat gain was not associated with night sweat reporting.
[WG#444]

482 Avis NE, Colvin A, Bromberger JT, Hess R, Matthews KA, Ory M, Schocken M. **Change in health-related quality of life over the menopausal transition in a multiethnic cohort of middle-aged women: Study of Women's Health Across the Nation.** Menopause. 2009:16(5):860-869.
Primary Question:
Summary of Findings: Women reported a greater impact of physical health on their functioning when they were late perimenopausal or postmenopausal than when they were premenopausal.
[WG#314]

483 Crawford S, Santoro N, Laughlin GA, Sowers MF, McConnell D, Sutton-Tyrrell K, Weiss G, Vuga M, Randolph J. Lasley B. **Circulating Dehydroepiandrosterone Sulfate Concentrations during the Menopausal Transition.** Journal of Clinical Endocrinology and Metabolism. 2009:94(8):2945-2951.
Primary Question:
Summary of Findings: DHEAS declines with age in premenopausal women, but exhibits a transient increase during the late menopause transition. Ovarian status-related patterns were similar in all 5 ethnic groups.
[WG#398]

484 Crandall CJ, Sehl ME, Crawford SL, Gold EB, Habel LA, Butler LM, Sowers MR, Greendale GA, Sinsheimer JS. **Sex steroid metabolism polymorphisms and mammographic density in pre- and early perimenopausal women.** Breast Cancer Research. 2009;11(4):R51.
Primary Question:
Summary of Findings: Genetic variations in the way estrogen is metabolized, and variations in estrogen receptor genes, may be associated with breast density.
[WG#447]

485 Fitchett G, Powell LH. **Daily Spiritual Experiences, Systolic Blood Pressure and Hypertension among Midlife Women in SWAN.** Annals of Behavioral Medicine. 2009;37(3):257-267.
Primary Question:
Summary of Findings: Daily spiritual experiences were not protective for systolic blood pressure or hypertension among midlife women in SWAN.
[WG#335/63]

486 Kagawa-Singer M, Adler SR, Mouton CP, Ory M, Underwood LG. **Use of focus groups in multi-site, multi-ethnic research projects for women's health: a Study of Women Across the Nation (SWAN) example.** Ethnicity and Disease. 2009;19(3):352-358.
Primary Question:
Summary of Findings: Each focus group session yielded important information about ethnic variations such as terminology, concepts and attitudes toward menopause and symptoms.
Using focus groups can provide greater insight into the meaning of cultural or ethnic differences, produce more cross-culturally valid interpretations, and enhance the validity and generalizability of the study data.
[WG#62]

487 Derby CA, Crawford SL, Pasternak RC, Sowers M, Sternfeld B, Matthews KA. **Lipid Changes During the Menopause Transition in Relation to Age and Weight: The Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2009;169(11):1352-1361.
Primary Question:
Summary of Findings: Changes in blood cholesterol occurred late in the menopause transition, with only small changes during early menopause, with peaks in total cholesterol, LDL cholesterol and triglyceride levels during late perimenopause. These changes were greater than changes due to aging. Increases in total and LDL cholesterol and in triglycerides were smallest among women who were heaviest at baseline.
[WG#176]

488 Greendale GA, Huang MH, Wight RG, Seeman T, Luetters C, Avis NE, Johnston J, Karlamangla AS. **Effects of the Menopause Transition and Hormone Use on Cognitive Performance in Midlife Women.** Neurology. 2009;72(21):1850-1857.
Primary Question:
Summary of Findings: Late perimenopause produced a subtle decrement in measured

cognitive performance, characterized by women not being able to learn as well as they had during pre- and early perimenopause. The disturbance appears to be transient, rebounding in postmenopause. Hormone use may have either beneficial or detrimental effects on cognitive performance, depending on when it is begun.
[WG#376]

489 Everson-Rose SA, Lewis TT, Karavolos K, Dugan SA, Wesley D, Powell LH. **Depressive Symptoms and Increased Visceral Fat in Middle-Aged Women.** Psychosomatic Medicine. 2009;71(4):410-416.
Primary Question:
Summary of Findings: Women with more depressive symptoms have significantly more visceral fat than less depressed women, after taking into account important risk factors for central adiposity. Depressive symptoms were not associated with subcutaneous fat.
[WG#339]

490 Avis NE, Brockwell S, Randolph JF Jr, Shen S, Cain VS, Ory M, Greendale GA. **Longitudinal changes in sexual functioning as women transition through menopause: results from the Study of Women's Health Across the Nation.** Menopause. 2009;16(3):442-452.
Primary Question:
Summary of Findings: The menopause transition is associated with decreases in women's sexual desire and increases in pain during sexual intercourse. The menopause transition does not have an impact on the importance of sex, emotional satisfaction or physical pleasure.
[WG#302]

491 Weiss G, Noorhasan D, Schott LL, Powell L, Randolph JF Jr, Johnston JM. **Racial Differences in Women Who have a Hysterectomy for Benign Conditions.** Women's Health Issues. 2009;19(3):202-210.
Primary Question:
Summary of Findings: Fibroids was a presenting symptom more frequently in African-American women than Caucasian women, while Caucasian women were more likely to have prolapse compared to African-American women. There were no differences between the groups in levels of estradiol or testosterone hormone levels. African-American women had almost twice the uterine weight as that of Caucasian women.
[WG#383]

492 Goldbacher EM, Bromberger J, Matthews KA. **Lifetime History of Major Depression Predicts the Development of the Metabolic Syndrome in Middle-Aged Women.** Psychosomatic Medicine. 2009;71(3):266-272.
Primary Question:
Summary of Findings: In the full sample of women (including women with the metabolic syndrome at baseline), lifetime history / current depression at baseline was associated with significantly greater odds of having the metabolic syndrome over the course of the study. In women who were free of the metabolic syndrome at baseline, lifetime history / current depression at baseline predicted significantly greater risk of developing the metabolic syndrome over the course of the follow-up.
[WG#292B]

493 Skurnick JH, Weiss G, Goldsmith LT, Santoro N, Crawford S. **Longitudinal changes in hypothalamic and ovarian function in perimenopausal women with anovulatory cycles: relationship with vasomotor symptoms.** Fertility and Sterility. 2009;91(4):1127-1134.
Primary Question:
Summary of Findings: Classes of anovulatory cycles do not progress predictably to menopause. Ovulatory cycles may recur in women whose previous cycles exhibited loss of estrogen-negative feedback on LH and FSH. Changes in cycle class do not correlate with occurrence of vasomotor symptoms.
[WG#296]

494 Crandall CJ, Zheng Y, Crawford SL, Thurston RC, Gold EB, Johnston JM, Greendale GA. **Presence of vasomotor symptoms is associated with lower bone mineral density: a longitudinal analysis.** Menopause. 2009;16(2):239-246.
Primary Question:
Summary of Findings: Even among women who are premenopausal or early in the menopause transition, women hot flashes and/or night sweats have a lower bone density on average than women without hot flashes or night sweats.
[WG#363]

495 Green R, Santoro N. **Menopausal symptoms and ethnicity: the Study of Women's Health Across the Nation.** Womens Health. 2009;5(2):127-133.
Primary Question:
Summary of Findings:
[WG#472]

496 Reeves KW, Stone RA, Modugno F, Ness RB, Vogel VG, Weissfeld JL, Habel LA, Sternfeld B, Cauley JA. **Longitudinal association of anthropometry with mammographic breast density in the Study of Women's Health Across the Nation.** International Journal of Cancer. 2009;124(5):1169-1177.
Primary Question:
Summary of Findings: Body mass index and weight were not associated with dense breast area in this longitudinal study. Both BMI and weight were negatively associated with percent density, however. Changes in BMI and weight may affect the non-dense breast tissue, rather than dense breast tissue where cancers arise.
[WG#381]

497 Torrens JI, Sutton-Tyrrell K, Zhao X, Matthews K, Brockwell S, Sowers M, Santoro N. **Relative androgen excess during the menopausal transition predicts incident metabolic syndrome in midlife women: Study of Women's Health Across the Nation.** Menopause. 2009;16(2):257-264.
Primary Question:
Summary of Findings: The baseline total estrogen and its rate of change were not associated with an increased incidence. A low SHBG as well as a high total testosterone at entry appeared to increase the risk independent of their respective change over time. Both higher baseline values and greater rate of change in the relative androgen excess increased the incidence of developing the metabolic syndrome, independent of ethnicity.

[WG#193A]

498 Okun ML, Kravitz HM, Sowers MF, Moul DE, Buysse DJ, Hall M. **Psychometric Evaluation of the Insomnia Symptom Questionnaire: a Self-report Measure to Identify Chronic Insomnia.** Journal of Clinical Sleep Medicine. 2009;5(1):41-51.
Primary Question:
Summary of Findings: The ISQ's high specificity suggests that a negative result with this instrument has a high probability of excluding those with insomnia. The high Positive Predictive Value indicates that the ISQ would have few false positives and useful in large observational studies in which the prevalence of insomnia is likely to be about 10%.
[WG#415]

499 Lewis TT, Everson-Rose SA, Colvin A, Matthews K, Bromberger JT, Sutton-Tyrrell K. **Interactive Effects of Race and Depressive Symptoms on Calcification in African American and White Women.** Psychosomatic Medicine. 2009;71(2):163-170.
Primary Question:
Summary of Findings: Depressive symptoms were associated with a greater amount of aortic calcification for African-American, but not Caucasian women. Depressive symptoms were not associated with coronary calcification for either racial/ethnic group.
[WG#408]

500 Dugan SA, Everson-Rose SA, Karavolos K, Sternfeld B, Wesley D, Powell LH. **The Impact of Physical Activity Level on SF-36 Role-Physical and Bodily Pain Indices in Midlife Women.** Journal of Physical Activity and Health. 2009;6(1):33-42.
Primary Question:
Summary of Findings: Physically active women were less likely to experience pain and had higher levels of physical functioning over 3 years compared to less active women. This association was evident after taking into account menopausal status, sociodemographic factors, and medical conditions.
[WG#264]

501 Weiss G, Maseelall P, Schott LL, Brockwell SE, Schocken M, Johnston JM. **Adenomyosis a variant, not a disease? Evidence from hysterectomized menopausal women in the Study of Women's Health Across the Nation (SWAN).** Fertility and Sterility. 2009;91(1):201-206.
Primary Question:
Summary of Findings: Adenomyosis was found in about one-half of the SWAN women who had hysterectomies and for whom the study was able to obtain pathology reports. All the conditions examined, which are commonly reported as being related to adenomyosis (fibroids, endometriosis, abnormal bleeding and chronic pain), were equally common in women with and without adenomyosis. Adenomyosis is a common occurrence that does not cause symptoms in this population.
[WG#382]

502 Bromberger JT, Kravitz HM, Matthews K, Youk A, Brown C, Feng W. **Predictors of first lifetime episodes of major depression in midlife women.** Psychological Medicine. 2009;39:55-64.

Primary Question:
Summary of Findings: After simultaneous adjustment for multiple predictors in Cox Proportional Hazards analyses, baseline role functioning due to physical health (p<.0001, a lifetime history of an anxiety disorder (p=.03), and hot flashes (p=.02) and a very stressful life event (p=.05) prior to depression onset predicted a first episode of depression.
[WG#266]

503 Troxel WM, Buysse DJ, Hall M, Matthews KA. **Marital Happiness and Sleep Disturbances in a Multi-Ethnic Sample of Middle-Aged Women.** Behavioral Sleep Medicine. 2009;7(1):2-19.
Primary Question:
Summary of Findings: Happily married, Caucasian women had fewer sleep disturbances as compared to their unhappily married counterparts. This association was independent of other risk factors, suggesting that marital happiness is not merely a proxy for being a "happy" person. There was no association between marital happiness and sleep disturbance in African American, Hispanic, Chinese, or Japanese women.
[WG#400]

504 Santoro NF, Green R. **Menopausal symptoms and ethnicity: Lessons from the Study of Women's Health Across the Nation.** Menopausal Medicine. 2009;17(1):S6-S8.
Primary Question:
Summary of Findings:
[WG#473]

505 Hall MH, Matthews KA, Kravitz HM, Gold EB, Buysse DJ, Bromberger JT, Owens JF, Sowers M. **Race and Financial Strain are Independent Correlates of Sleep in Midlife Women: The SWAN Sleep Study.** Sleep. 2009;32(1):73-82.
Primary Question:
Summary of Findings: Sleep characteristics differ by race. African American and Caucasian women who report that it is somewhat to very hard to pay for the very basics like food and housing have poorer sleep quality and a harder time falling and staying asleep at night, compared to women who report no difficulty paying for basics.
[WG#351]

506 Crawford SL, Avis NE, Gold E, Johnston J, Kelsey J, Santoro N, Sowers M, Sternfeld B. **Sensitivity and Specificity of Recalled Vasomotor Symptoms in a Multiethnic Cohort.** American Journal of Epidemiology. 2008:168(12):1452-1459.
Primary Question:
Summary of Findings: Both sensitivity and specificity of retrospective reporting for any vs. no vasomotor symptoms were high. Accuracy of retrospective reporting was highest among women with no symptomatic days or many symptomatic days in daily reporting, i.e., at the two extremes of symptom frequency.
[WG#256]

507 Scuteri A, Vuga M, Najjar SS, Mehta V, Everson-Rose SA, Sutton-Tyrrell K, Matthews K, Lakatta EG. **Education eclipses ethnicity in predicting the development of the metabolic syndrome in different ethnic groups in midlife: the Study of Women's Health**

Across the Nation (SWAN). Diabetic Medicine. 2008;25(12):1390-1399.
Primary Question:
Summary of Findings: Approximately 10% of perimenopausal women developed the metabolic syndrome during the five year follow-up. SES, but not ethnicity, was an independent predictor of incident metabolic syndrome risk.
[WG#249]

508 Butler LM, Gold EB, Greendale GA, Crandall CJ, Modugno F, Oestreicher N, Quesenberry CP Jr, Habel LA. **Menstrual and reproductive factors in relation to mammographic density: the Study of Women's Health Across the Nation (SWAN).** Breast Cancer Research and Treatment. 2008;112(1):165-174.
Primary Question:
Summary of Findings: The following menstrual and reproductive factors were found to be associated with greater or less mammographic density, a risk factor for breast cancer: older age at menarche (greater), history of premenstrual cravings and bloating (less), younger age at first full-term birth (less), being premenopausal (greater). However, the associations between mammographic density and the menstrual and reproductive factors listed above were not independent of other factors, such as body size, age, race/ethnicity, smoking, or the plasma sex hormone, sex hormone-binding globulin.
[WG#343]

509 Sowers MR, Randolph J Jr, Jannausch M, Lasley B, Jackson E, McConnell D. **Levels of Sex Steroid and Cardiovascular Disease Measures in Premenopausal and Hormone-Treated Women at Midlife: Implications for the "Timing Hypothesis".** Archives of Internal Medicine. 2008;168(19):2146-2153.
Primary Question:
Summary of Findings: There were competing CVD risk factor profiles when comparing premenopausal women and the same-aged women using HT. In the HT users, there were more favorable lipid profiles than the same aged premenopausal women but, concurrently, more negative oxidative/thrombotic/inflammatory profiles. These findings do not support assumptions that having only short-term time discontinuity before HT use is likely to replicate the environment in either premenopausal or immediately postmenopausal women.
[WG#329A]

510 Sowers MF, Zheng H, Kravitz HM, Matthews K, Bromberger JT, Gold EB, Owens J, Consens F, Hall M. **Sex Steroid Hormone Profiles are Related to Sleep Measures from Polysomnography and the Pittsburgh Sleep Quality Index.** Sleep. 2008;31(10):1339-1349.
Primary Question:
Summary of Findings: More rapid rate of follicle stimulating hormone (FSH) change was significantly associated with higher delta sleep percent, longer total sleep time (TST), but less favorable self-reported sleep quality from the Pittsburgh Sleep Quality Index (PSQI). Baseline estradiol (E20 was modestly and negatively associated with sleep quality. Women in the lowest total testosterone (T) quartile at baseline had more wake time after sleep onset (WASO) than women in the highest quartile. Lower E2/T ratio, an index reflecting the increasing androgenic environment with the menopause transition, was associated with less WASO. Therefore, more rapid rate of FSH change was associated with longer sleep duration but less favorable self-reported sleep quality. Women with higher T or who were moving

toward the completion of the transition process (as indexed by a lower E2/T) had less sleep discontinuity as characterized by WASO.
[WG#397]

511 Thurston RC, Sutton-Tyrrell K, Everson-Rose SA, Hess R, Matthews KA. **Hot Flashes and Subclinical Cardiovascular Disease: Findings from the Study of Women's Health Across the Nation Heart Study.** Circulation. 2008;118(12):1234-1240.
Primary Question:
Summary of Findings: Women with hot flashes were more likely to have evidence of subclinical disease (i.e., endothelial dysfunction, aortic calcification) than women without hot flashes.
[WG#416]

512 Thurston RC, Bromberger JT, Joffe H, Avis NE, Hess R, Crandall CJ, Chang Y, Green R, Matthews KA. **Beyond frequency: who is most bothered by vasomotor symptoms?** Menopause. 2008;15(5):841-847.
Primary Question:
Summary of Findings: Factors such as mood, symptom sensitivity, sleep problems, duration of vasomotor symptoms, age and race are associated with bother associated with vasomotor symptoms, above and beyond the frequency of vasomotor symptoms.
[WG#399]

513 Janssen I, Powell LH, Crawford S, Lasley B, Sutton-Tyrrell K. **Menopause and the Metabolic Syndrome: The Study of Women's Health Across the Nation (SWAN).** Archives of Internal Medicine. 2008;168(14):1568-1575.
Primary Question:
Summary of Findings: As testosterone increases over the menopausal transition, the prevalence of the metabolic syndrome increases, independently of age and other important covariates. This suggests that one pathway by which cardiovascular disease increases in women is via the menopause-related increasing androgenicity of the hormonal milieu.
[WG#289]

514 Kravitz HM, Zhao X, Bromberger JT, Gold EB, Hall MH, Matthews KA, Sowers MR. **Sleep Disturbance During the Menopausal Transition in a Multi-Ethnic Community Sample of Women.** Sleep. 2008;31(7):979-990.
Primary Question:
Summary of Findings: Progression through the menopausal transition as indicated by 3 menopausal characteristics – symptoms, bleeding-defined stages, and endogenous hormone levels – is associated with self-reported sleep disturbances. Difficulty falling asleep and staying asleep increased through the menopausal transition, but early morning awakening decreased from late perimenopause to postmenopause. Women with more frequent VMS also were more likely to report each type of sleep difficulty. Women with decreasing E2 levels were more likely to report trouble falling and staying asleep, and those with increasing FSH levels were more likely to report trouble staying asleep. There were racial/ethnic differences in difficulties staying asleep and early morning awakening but no significant differences in falling asleep.
[WG#138]

515 Van Voorhis BJ, Santoro N, Harlow S, Crawford SL, Randolph J. **The Relationship of Bleeding Patterns to Daily Reproductive Hormones in Women Approaching Menopause.** Obstetrics and Gynecology. 2008;112(1):101-108.
Primary Question:
Summary of Findings: Changes in timing of bleeding (interval and duration) are associated with anovulation. Changes in amount of bleeding (heavy bleeding or menorrhagia) are not associated with anovulation but are associated with fibroids and obesity.
[WG#217A]

516 Kelley-Hedgepeth A, Lloyd-Jones DM, Colvin A, Matthews KA, Johnston J, Sowers MR, Sternfeld B, Pasternak RC, Chae CU. **Ethnic Differences in C-Reactive Protein Concentrations.** Clinical Chemistry. 2008;54(6):1027-1037.
Primary Question:
Summary of Findings: C-reactive protein levels vary with ethnicity; the highest levels are found in African-American women, followed in order by Hispanic women, Caucasian, Chinese and Japanese women. Modifiable risk factors, particularly body mass index, account for much but not all of the differences in CRP levels between ethnic groups.
[WG#274]

517 Santoro N, Crawford SL, Lasley WL, Luborksy JL, Matthews KA, McConnell D, Randolph JF, Gold EB, Greendale GA, Korenman SG, Powell L, Sowers MF, Weiss G. **Factors Related to Declining Luteal Function in Women during the Menopausal Transition.** Journal of Clinical Endocrinology and Metabolism. 2008;93(5):1711-1721.
Primary Question:
Summary of Findings: The per cent of ovulatory cycles declined over a three year observation period (H1-H3). Luteal progesterone decreased over time in ovulatory cycles. Anovulatory cycles that did not end with a menstrual period appeared to be associated with progress through the menopausal transition.
[WG#211]

518 Hess R, Colvin A, Avis NE, Bromberger JT, Schocken M, Johnston JM, Matthews KA. **The impact of hormone therapy on health-related quality of life: longitudinal results from the Study of Women's Health Across the Nation.** Menopause. 2008;15(3):422-428.
Primary Question:
Summary of Findings: Poor HRQOL does not increase the likelihood of initiating HT, nor is HT use associated with subsequent improvements in HRQOL. The exception to this may be women who have high levels of menopausal symptoms.
[WG#313]

519 Sowers M, McConnell D, Jannausch ML, Randolph JF Jr, Brook R, Gold EB, Crawford S, Lasley B. **Oestrogen metabolites in relation to isoprostanes as a measure of oxidative stress.** Clinical Endocrinology. 2008;68(5):806-813.
Primary Question:
Summary of Findings: F2a-isoprostane concentrations were doubled in women who smoked compared to nonsmokers, indicating much more oxidative stress in women who smoked. With the exception of postmenopausal nonsmoking women, E2 was poorly

correlated with the F2a-isoprostanes, indicating that those with higher measured levels of estradiol were not necessarily likely to have less oxidative stress . Both 2-OHE1 and 16á-OHE1 were positively correlated with F2a-isoprostanes, with the exception of 2-OHE1 in postmenopausal smokers, suggesting that these estrogen metabolites behave more like markers of oxidative stress rather than antioxidants.
[WG#364]

520 Wildman RP, Colvin AB, Powell LH, Matthews KA, Everson-Rose SA, Hollenberg S, Johnston JM, Sutton-Tyrrell K. **Associations of endogenous sex hormones with vasculature in menopausal women: the Study of Women's Health Across the Nation (SWAN).** Menopause. 2008;15(3):414-421.
Primary Question:
Summary of Findings: Both menopause status and lower estrogen levels were associated with adverse alterations in the vascular system. These results may partially explain the increased risk of CVD with postmenopause.
[WG#315]

521 Thurston RC, Sowers MR, Sutton-Tyrrell K, Everson-Rose SA, Lewis TT, Edmundowicz D, Matthews KA. **Abdominal adiposity and hot flashes among midlife women.** Menopause. 2008;15(3):429-434.
Primary Question:
Summary of Findings: Increased abdominal adiposity is associated with a greater likelihood of reporting hot flashes among midlife women. Differences in reproductive hormones estradiol and follicular stimulating hormone did not account for the association between adiposity and hot flashes.
[WG#338]

522 Tomey KM, Sowers MR, Crandall C, Johnston J, Jannausch M, Yosef M. **Dietary Intake Related to Prevalent Functional Limitations in Midlife Women.** American Journal of Epidemiology. 2008;167(8):935-943.
Primary Question:
Summary of Findings: Higher baseline intakes of dietary cholesterol and total and saturated fat, lower intake of fiber, along with higher BMI and lower levels of physical activity were consistently associated with greater functional limitations assessed 4 years later, even following adjustment for demographic variables and health conditions. These dietary associations were observed whether the data were expressed in relation to recommended intakes or in relation to nutrient intake quality with respect to total energy consumed. Greater subsequent functional limitations were also associated with lower baseline magnesium and lycopene intakes as well as fewer baseline fruit and vegetable servings.
[WG#396]

523 Oestreicher N, Capra A, Bromberger J, Butler LM, Crandall CJ, Gold EB, Greendale GA, Modugno F, Sternfeld B, Habel LA. **Physical Activity and Mammographic Density in a Cohort of Midlife Women.** Medicine and Science in Sports and Exercise. 2008;40(3):451-456.
Primary Question:
Summary of Findings: We found that breast density is associated with how physically active a woman is, but only for certain types of activities. If women have an active lifestyle

(non-leisure activities) or are active in the household or in caregiving, their breast density may be lower. It appeared that women's level of activity in their occupation or for recreation are not associated with breast density.
[WG#369]

524 Waetjen LE, Feng W, Ye J, Johnson WO, Greendale GA, Sampselle CM, Sternfeld B, Harlow SD, Gold EB for the Study of Women's Health Across the Nation (SWAN). **Factors Associated With Worsening and Improving Urinary Incontinence Across the Menopausal Transition.** Obstetrics & Gynecology. 2008;111(3):667-677.
Primary Question:
Summary of Findings: Women with urinary incontinence in peri- and post-menopause are more likely to report improvement in their incontinence symptoms. Meanwhile, aging, increases in waist to hip ratio and weight cycling are associated with worsening incontinence symptoms.
[WG#248E]

525 Ram KT, Bobby P, Hailpern SM, Lo JC, Schocken M, Skurnick J, Santoro N. **Duration of lactation is associated with lower prevalence of the metabolic syndrome in midlife—SWAN, the study of women's health across the nation.** American Journal of Obstetrics & Gynecology. 2008;198(3):268.e1-6.
Primary Question:
Summary of Findings: A history of breastfeeding is associated with a lower prevalence of metabolic syndrome in midlife.
[WG#350]

526 Finkelstein JS, Brockwell SE, Mehta V, Greendale GA, Sowers MR, Ettinger B, Lo JC, Johnston JM, Cauley JA, Danielson ME, Neer RM. **Bone Mineral Density Changes during the Menopause Transition in a Multiethnic Cohort of Women.** Journal of Clinical Endocrinology & Metabolism. 2008;93(3):861-868.
Primary Question:
Summary of Findings: There is little or no bone loss in the pre- and early perimenopause. Rates of both lumbar spine and total hip bone loss accelerate substantially in the late perimenopause and continue at a similar pace in the early postmenopausal years. Body weight is a major determinant of the rate of bone loss during the menopause transition, with women of lower body weight losing bone more rapidly. Observed ethnic differences in rates of menopausal bone loss are largely explained by differences in body weight.
[WG#174]

527 Harlow SD, Mitchell ES, Crawford S, Nan B, Little R, Taffe J, for the ReSTAGE Collaboration. **The ReSTAGE Collaboration: Defining Optimal Bleeding Criteria for Onset of Early Menopausal Transition.** Fertility and Sterility. 2008;89(1):129-140.
Primary Question:
Summary of Findings: A skipped segment, a 10-segment running range >42 days and a segment of at least 60 days identify a similar moment in women's reproductive lives, with the latter two identifying the exact same moment in two-thirds of women. All three markers occur in a greater proportion of women than the 90-day marker and are equally predictive of the FMP although they occur one to two years earlier. These findings support the STRAW recommendation that a shorter duration of amenorrhea be used as the bleeding criterion for

the late transition.

A standard deviation >6 or >8 days, persistent difference in consecutive cycles of >6 days, irregularity, and a cycle >45 days were evaluated. Most women experienced each of the changes in menstrual function described by the proposed bleeding markers of the early menopausal transition. Except for the persistent >6 day difference which occurs earlier, proposed markers of the early transition occur at a similar time in women's reproductive life and at approximately the same age as the late menopausal transition in a large proportion of women. FSH levels were associated with occurrence of all the proposed markers. Selection of the optimal marker requires consensus regarding whether the biological concept of early transition is best described by ovarian activity consistent with earlier changes identified by the persistent >6 day difference or by that consistent with later menstrual changes.
[WG#345/346B]

528 Bair YA, Gold EB, Zhang G, Rasor N, Utts J, Upchurch DM, Chyu L, Greendale GA, Sternfeld B, Adler SR. **Use of complementary and alternative medicine during the menopause transition: longitudinal results from the Study of Women's Health Across the Nation.** Menopause. 2008;15(1):32-43.
Primary Question:
Summary of Findings: Women's cultural and personal characteristics influence the decision to use complementary and alternative medicine more than symptom experience or menopausal status.
[WG#262]

529 Thurston RC, Bromberger J, Chang Y, Goldbacher E, Brown C, Cyranowski JM, Matthews KA. **Childhood abuse or neglect is associated with increased vasomotor symptom reporting among midlife women.** Menopause. 2008;15(1):16-22.
Primary Question:
Summary of Findings: Childhood abuse or neglect is associated with increased vasomotor symptom reporting during the menopausal transition. This relation was observed across multiple forms of abuse and neglect and in both African American and Caucasian women.
[WG#365]

530 Thurston RC, Sowers MR, Chang Y, Sternfeld B, Gold EB, Johnston JM, Matthews KA. **Adiposity and Reporting of Vasomotor Symptoms among Midlife Women: The Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2008;167(1):78-85.
Primary Question:
Summary of Findings: Higher total percentage of body fat is associated with a higher likelihood of reporting vasomotor symptoms among midlife women.
[WG#361]

531 Gold EB, Lasley B, Crawford SL, McConnell D, Joffe H, Greendale GA. **Relation of Daily Urinary Hormone Patterns to Vasomotor Symptoms in a Racially/Ethnically Diverse Sample of Midlife Women: Study of Women's Health Across the Nation.** Reproductive Sciences. 2007;14(8):786-797.
Primary Question:
Summary of Findings: Vasomotor symptoms were less frequent in women with greater

ovarian function. Associations of other factors with vasomotor symptoms – smoking, physical activity, and possibly body mass index – varied by degree of ovarian function.
[WG#210]

532 Tomey KM, Sowers MR, Li X, McConnell DS, Crawford S, Gold EB, Lasley B, Randolph JF, Jr. **Dietary Fat Subgroups, Zinc, and Vegetable Components Are Related to Urine F2a-Isoprostane Concentration, a Measure of Oxidative Stress, in Midlife Women.** Journal of Nutrition. 2007;137(11):2412-2419.
Primary Question:
Summary of Findings: There were consistent associations between higher trans fat intake and higher F2a-isoprostanes, and higher lutein and lower F2a-isoprostanes in smokers and non-smokers, cross-sectionally and across time. Among smokers and non-smokers, cross-sectional associations between F2a-isprostanes and trans fatty acids were observed at the year 05 follow up visit, in analyses adjusted for recruitment site, age, race, body mass index (kg/m2), and physical activity. Regression models with adjustment showed that higher baseline intakes of trans fat and increased intake of trans fat from baseline to Y05 were significantly associated with higher levels of F2a-isprostanes. In smokers and non-smokers, higher lutein intakes at year 05 were associated with lower F2a-isprostanes at year 05. Higher baseline intakes of lutein from vegetables were significantly associated with lower levels of F2a-isprostanes in both smokers and non-smokers.
[WG#374]

533 Habel LA, Capra AM, Oestreicher N, Greendale GA, Cauley JA, Bromberger J, Crandall CJ, Gold EB, Modugno F, Salane M, Quesenberry C, Sternfeld B. **Mammographic Density in a Multiethnic Cohort.** Menopause. 2007;14(5):891-899.
Primary Question:
Summary of Findings: Mammographic density varied by race/ethnicity, but the pattern differed by method of classifying density. Density was not highest among those racial/ethnic groups with the highest breast cancer rates. Mammographic density was lower in more acculturated Asian women.
[WG#300]

534 Crawford S. **The roles of biologic and nonbiologic factors in cultural differences in vasomotor symptoms measured by surveys.** Menopause. 2007;14(4):725-733.
Primary Question:
Summary of Findings: Cultural differences in VMS reporting on surveys reflect both differences in underlying biology or physiologic mechanisms, which are likely to affect VMS occurrence, and differences in non-biologic sociocultural factors likely to be related to VMS perception and/or reporting.
[WG#391]

535 Avis NE, Colvin A. **Disentangling cultural issues in quality of life data.** Menopause. 2007;14(4):708-716.
Primary Question:
Summary of Findings: We found that controlling for covariates explained the majority of ethnic differences in HRQL. Degree of acculturation was related to several of the outcomes and may reflect cultural differences in the impact of physical and mental health on quality of life.

[WG#370]

536 Gold EB, Bair Y, Block G, Greendale GA, Harlow SD, Johnson S, Kravitz HM, Rasor M, Siddiqui A, Sternfeld B, Utts J, Zhang G. **Diet and Lifestyle Factors Associated with Premenstrual Symptoms in a Racially Diverse Community Sample: Study of Women's Health Across the Nation (SWAN).** Journal of Women's Health. 2007;16(5):641-656.
Primary Question:
Summary of Findings: In multivariate models, dietary factors were largely not associated with any of the symptom groupings. Caffeine intake was positively associated premenstrual anxiety and mood changes. Alcohol was negatively associated with premenstrual anxiety and mood changes and headaches. Active and passive smoke exposure were positively associated with a number of premenstrual symptoms. Number of comorbidities, depressive symptoms, symptom sensitivity, increased BMI and early perimenopause (compared to premenopause) were positively associated with a number of premenstrual symptoms, and reporting of symptoms varied by race/ethnicity.
[WG#111]

537 Zhang D, Lin X, Sowers M. **Two-Stage Functional Mixed Models for Evaluating the Effect of Longitudinal Covariate Profiles on Scalar Outcome.** Biometrics. 2007;63(2):351-362.
Primary Question:
Summary of Findings: Extensions of the statistical work originally developed and published by Zhang, Lin, and Sowers allow the use of longitudinal and non-linear data (like that occurring in menstrual cycles) to be related to bone mineral density.
[WG#379]

538 Marcus MD, Bromberger JT, Wei H, Brown C, Kravitz HM. **Prevalence and Selected Correlates of Eating Disorder Symptoms Among a Multiethnic Community Sample of Midlife Women.** Annals of Behavioral Medicine. 2007;33(3):269-277.
Primary Question:
Summary of Findings: Rates of regular binge eating, dissatisfaction with eating patterns, and marked fear of weight gain were 11%, 29.3%, and 9.2%, respectively. African Americans were likelier than were Whites to report fasting. In multivariable analyses, high BMI (or waist circumference), depressive symptoms, past depression, and history of childhood/adolescence abuse were significantly associated with the binge eating and preoccupation with body image and weight subscale scores (comprised of 7 to 16 items).
[WG#179]

539 Crandall CJ, Zheng Y, Karlamangla A, Sternfeld B, Habel LA, Oestreicher N, Johnston J, Cauley JA, Greendale GA. **The Association Between Mammographic Breast Density and Bone Mineral Density in the Study of Women's Health Across the Nation.** Annals of Epidemiology. 2007;17(8):575-583.
Primary Question:
Summary of Findings: The higher the mammographic breast density, the lower the bone mineral density. This observation was especially apparent in early perimenopausal women, and less obvious in premenopausal women.
[WG#337]

540 Santoro N. **Is it menopause or is it something else? Attributing symptoms to menopause.** Menopause Management. 2007;16:9-11.
Primary Question:
Summary of Findings:
[WG#405]

541 Santoro N. **Women want to know: Predicting the final menses.** Sexuality, Reproduction & Menopause. 2007;19(5):6-10.
Primary Question:
Summary of Findings: Age, menstrual cycle interval, smoking behavior, and the hormones FSH and estradiol can all help a woman predict when her menstrual periods will cease at the time of the menopause transition.
[WG#260B]

542 Santoro N, Brockwell S, Johnston J, Crawford SL, Gold EB, Harlow SD, Matthews KA, Sutton-Tyrrell K. **Helping midlife women predict the onset of the final menses: SWAN, the Study of Women's Health Across the Nation.** Menopause. 2007;14(3):415-424.
Primary Question:
Summary of Findings: A woman's age, and her estimate of more variability or lengthening of her menstrual cycles help to predict how much longer she will continue to get her period. Whether or not she smokes or is exposed to smoke, and hormone levels can make this prediction more precisely. Women who exercise may take longer to go through menopause than women who don't. A woman's ethnic group may also be a factor that can help her tell when her periods will end.
[WG#260]

543 Harlow SD, Crawford S, Dennerstein L, Burger HG, Mitchell ES, Sowers MF for the ReSTAGE Collaboration. **Recommendations from a multi-study evaluation of proposed criteria for Staging Reproductive Aging.** Climacteric. 2007;10(2):112-119.
Primary Question:
Summary of Findings: This empirical assessment supported the STRAW recommendations that a) >=60-days of amenorrhea be used to define the late menopausal transition and b) that early transition is consistent with a persistent 7 or more day difference in length of consecutive cycles. Serum FSH values >= 40 IU/L was an independent marker of the transition and when occurring together with a bleeding marker increased prediction of FMP.
[WG#345/346C]

544 Meyer PM, Zeger SL, Harlow SD, Sowers M, Crawford S, Luborsky JL, Janssen I, McConnell DS, Randolph JF, Weiss G. **Characterizing Daily Urinary Hormone Profiles for Women at Midlife Using Functional Data Analysis.** American Journal of Epidemiology. 2007;165(8):936-45.
Primary Question:
Summary of Findings: We identified multiple differences in hormone profiles associated with variation in cycle length. Very short and longer than typical cycles were characterized by increasingly chaotic variability. An estrone conjugate follicular/luteal phase asymmetry differed across body mass index categories.
[WG#234]

545 Luetters C, Huang MH, Seeman T, Buckwalter G, Meyer PM, Avis NE, Sternfeld B, Johnston JM, Greendale GA. **Menopause Transition Stage and Endogenous Estradiol and Follicle-Stimulating Hormone Levels Are Not Related to Cognitive Performance: Cross-Sectional Results from the Study of Women's Health Across the Nation (SWAN).** Journal of Women's Health. 2007;16(3):331-44.
Primary Question:
Summary of Findings: Our findings suggest that there is no relation between cognitive test performance and menopause stage. Likewise no association was found between cognitive performance and FSH or estradiol levels.
[WG#225]

546 Sowers M, Zheng H, Tomey K, Karnoven-Guteirrez C, Jannausch M, Li X, Yosef M, Symons J. **Changes in Body Composition in Women over Six Years at Midlife: Ovarian and Chronological Aging.** Journal of Clinical Endogrinology and Metabolism. 2007;92(3):895-901.
Primary Question:
Summary of Findings:
[WG#359]

547 Matthews KA, Schott LL, Bromberger J, Cyranowski J, Everson-Rose SA, Sowers MF. **Associations Between Depressive Symptoms and Inflammatory/Hemostatic Markers in Women During the Menopausal Transition.** Psychosomatic Medicine. 2007;69(2):124-130.
Primary Question:
Summary of Findings: Women with higher levels of depression have higher levels of fibrinogen, a measure of blood coagulation, even after taking into account other health and lifestyle factors. Obesity is strongly related to markers of inflammation and hemostasis. In addition to obesity, markers of hemostasis are also elevated among late perimenopausal and postmenopausal women compared to premenopausal women.
[WG#272]

548 Fitchett G, Murphy PE, Kravitz HM, Everson-Rose SA, Krause NM, Powell LH. **Racial/Ethnic Differences in Religious Involvement in a Multi-Ethnic Cohort of Midlife Women.** Journal for the Scientific Study of Religion. 2007;46(1):119-132.
Primary Question:
Summary of Findings: We found higher levels of religious involvement among Black and Hispanic women compared to White and Asian women. White and Japanese women reported similar levels of involvement for all measures of religion. Compared to the White women, the Chinese women reported similar levels of worship attendance and religious social support, but lower levels for the other 3 measures of religion. These racial/ethnic differences were not explained by differences in religious preference, acculturation or socio-demographic factors.
[WG#61]

549 Bromberger JT, Matthews KA, Schott LL, Brockwell S, Avis NE, Kravitz HM, Everson-Rose SA, Gold EB, Sowers M, Randolph JF Jr. **Depressive symptoms during the menopause transition: The Study of Women's Health Across the Nation (SWAN).** Journal of Affective

Disorders. 2007;103:267-272.
Primary Question:
Summary of Findings: Midlife women are more likely to experience high levels of depressive symptoms when peri- or postmenopausal or using hormone therapy than when premenopausal. Premenopausal women who have low depressive symptom levels at baseline (relative to women with high levels) are at a somewhat greater risk for higher symptoms during the peri- and post menopause. Menopausal status, as well as other health and lifestyle factors, influences depressive symptoms during the menopause transition.
[WG#252]

550 Gold EB, Bair Y, Zhang G, Utts J, Greendale GA, Upchurch D, Chyu L, Sternfeld B, Adler S. **Cross-sectional analysis of specific complementary and alternative medicine (CAM) use by racial/ethnic group and menopausal status: the Study of Women's Health Across the Nation (SWAN).** Menopause. 2007;14(4):612-623.
Primary Question:
Summary of Findings: Over half of women used some type of CAM. Use of most types of CAM differed significantly by race/ethnicity, except use of ginkgo biloba, glucosamine and yoga. Use of most types of CAM did not differ significantly by menopausal status or vasomotor symptoms, except use of soy supplements which was significantly greater in late and surgically menopausal women who were not using hormones. Women reporting somatic symptoms were significantly more likely to use glucosamine. Women reporting psychological symptoms were significantly more likely to use ginkgo biloba and soy supplements. Number of comorbidities, moderate or high socioeconomic status, number of healthy behaviors, symptom sensitivity, age and dietary genistein intake were significantly positively associated with use of several types of CAM.
[WG#319]

551 Waetjen LE, Liao S, Johnson WO, Sampselle CM, Sternfeld B, Harlow SD, Gold EB. **Factors Associated with Prevalent and Incident Urinary Incontinence in a Cohort of Midlife Women: A Longitudinal Analysis of Data: Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2007;165(3):309-318.
Primary Question:
Summary of Findings: First reported incontinence that develops in mid-life is mild, with a higher proportion of the urge type and different risk factors. African American and overweight women appear to be at the greatest risk of developing incontinence in mid-life.
[WG#248C]

552 Cyranowski JM, Marsland AL, Bromberger JT, Whiteside TL, Chang Y, Matthews KA. **Depressive symptoms and production of proinflammatory cytokines by peripheral blood mononuclear cells stimulated in vitro.** Brain, Behavior & Immunity. 2007;21(2):229-237.
Primary Question:
Summary of Findings: Midlife women with elevated levels of depressive symptoms displayed decreased mitogen-stimulated production of proinflammatory cytokines IL-6, IL-1â and TNF-á, reflecting diminished immune competence. Importantly, the relationship between depression and immune competence remained significant following control for such health-related variables as age, BMI, recent sleep disruption, physical activity level and psychotropic medication use.

[WG#263]

553 Johnston JM, Colvin A, Johnson BD, Santoro N, Harlow SD, Merz CN, Sutton-Tyrrell K. **Comparison of SWAN and WISE Menopausal Status Classification Algorithms.** Journal of Women's Health. 2006;15(10):1184-94.
Primary Question:
Summary of Findings: Of the 3215 SWAN women with complete information at baseline, 2466 (76.7%) received the same menopausal status classification at baseline and 749 (23.3%) received different classifications. While the two algorithms may classify a given woman differently on a given day, both approaches track progression through the transition over time. Choosing which to use should depend on the study population, including the proportion of women who are not cycling due to health reasons, and on the ability to obtain samples for hormone assays. Further work is needed to more precisely define optimal criteria for staging menopausal aging.
[WG#259]

554 Farhat GN, Cauley JA, Matthews KA, Newman AB, Johnston J, Mackey RH, Edmundowicz D, Sutton-Tyrrell K. **Volumetric BMD and Vascular Calcification in Middle-Aged Women: The Study of Women's Health Across the Nation.** Journal of Bone and Mineral Research. 2006;21(12):1839-1846.
Primary Question:
Summary of Findings: Lower BMD was related to a higher degree of calcification in the aorta but not the coronary arteries.
[WG#285]

555 Everson-Rose SA, Lewis TT, Karavolos K, Matthews KA, Sutton-Tyrrell K, Powell LH. **Cynical hostility and carotid atherosclerosis in African American and white women: The Study of Women's Health Across the Nation (SWAN) Heart Study.** American Heart Journal. 2006;152(5):982.e7-e13.
Primary Question:
Summary of Findings: We found that hostility was positively related to extent of carotid artery intimal-medial thickening (IMT), a subclinical marker of heart disease risk. Women with high hostility scores had significantly greater IMT compared with women with low hostility scores, after taking into account the effects of age, race, study site, obesity, smoking and blood pressure. The level of risk associated with hostility was similar to the excess risk conferred by obesity, age and blood pressure, known risk factors for heart disease. Hostility was not related to presence of plaque in the carotid arteries.
[WG#279]

556 Grewal J, Sowers MR, Randolph JF Jr, Harlow SD, Lin X. **Low Bone Mineral Density in the Early Menopausal Transition: Role for Ovulatory Function.** Journal of Clinical Endocrinology & Metabolism. 2006;91(10):3780-3785.
Primary Question:
Summary of Findings: Direct measures of urinary hormones rather than menstrual cycle ovulatory characteristics were associated with lower levels of BMD.
[WG#197]

557 Harlow SD, Cain K, Crawford S, Dennerstein L, Little R, Mitchell ES, Nan B, Randolph J, Taffe J, Yosef M. **Evaluation of Four Proposed Bleeding Criteria for the Onset of Late Menopausal Transition.** Journal of Clinical Endocrinology and Metabolism. 2006;91(9):3432-3438.
Primary Question:
Summary of Findings: A skipped segment, a 10-segment running range >42 days and a segment of at least 60 days identify a similar moment in women's reproductive lives, with the latter two identifying the exact same moment in two-thirds of women. All three markers occur in a greater proportion of women than the 90-day marker and are equally predictive of the FMP although they occur one to two years earlier. These findings support the STRAW recommendation that a shorter duration of amenorrhea be used as the bleeding criterion for the late transition.
[WG#345]

558 Sowers MR, Jannausch ML, McConnell DS, Kardia SR, Randolph JF. **Endogenous Estradiol and Its Association with Estrogen Receptor Gene Polymorphisms.** American Journal of Medicine. 2006;119(9A):S16-S22.
Primary Question:
Summary of Findings: We identified two polymorphisms, one for the ERá and one for ERâ, whose association with circulating hormone E2 levels may have physiological meaning. In both instances, one genotype in each polymorphism was associated with lower levels of E2.
[WG#304]

559 Sowers MR, Wilson AL, Kardia SR, Chu J, Ferrell R. **Aromatase Gene (CYP 19) Polymorphisms and Endogenous Androgen Concentrations in a Multiracial/Multiethnic, Multisite Study of Women at Midlife.** American Journal of Medicine. 2006;119(9A):S23-S30.
Primary Question:
Summary of Findings: Three aromatase gene SNPs were associated with variation in serum androgen concentrations, within and between racial groups. The CYP19 6306 AA genotype was associated with a significant difference in the T:E2 ratio, especially among African-American women. Japanese women with the CYP19 9292 AA genotype had lower E2 and T levels and higher SHBG when compared to Japanese women with CYP19 9292 AG or GG genotypes.
[WG#309]

560 Sowers MR, Wilson AL, Kardia SR, Chu J, McConnell DS. **CYP1A1 and CYP1B1 Polymorphisms and Their Association with Estradiol and Estrogen Metabolites in Women Who Are Premenopausal and Perimenopausal.** American Journal of Medicine. 2006;119(9A):S44-S51.
Primary Question:
Summary of Findings: The CYP1A1 rs2606345 polymorphism may play an important role in estrogen metabolism in pre- and peri-menopausal women. Japanese women with the CC genotype had lower E2 concentrations than Japanese women with the AC genotype, of this polymorphism, while Chinese women with the CC genotype had higher 2-OHE1 concentrations than Chinese women with the AC genotype. Further, African-American women with the CC genotype had higher 16á-OHE1 concentrations compared to those with other genotypes.

[WG#321]

561 Greendale GA, Chu J, Ferrell R, Randolph JF, Johnston JM, Sowers MR. **The Association of Bone Mineral Density with Estrogen Receptor Gene Polymorphisms.** American Journal of Medicine. 2006;119(9A):S79-S86.
Primary Question:
Summary of Findings: Specific associations of BMD and ESR1 or ESR2 genotypes varied according to race group. The ESR2 rs1256030 or rs1256065 SNPs should have further evaluation with bone mineral density measures in Chinese and Caucasian populations.
[WG#307]

562 Crandall CJ, Crawford SL, Gold EB. **Vasomotor Symptom Prevalence Is Associated with Polymorphisms in Sex Steroid-Metabolizing Enzymes and Receptors.** American Journal of Medicine. 2006;119(9A):S52-S60.
Primary Question:
Summary of Findings: Prevalence of VMS reporting increased in all race groups from baseline to the 6th annual follow-up visit. After adjustment for covariates, several SNP's encoding genes responsible for estrogen metabolism and estrogen receptors were associated with decreased odds of reporting VMS: including CYP1B1 rs1056836 GC genotype in African Americans, 17HSD rs615942 TG, rs592389 TG, and rs2830 AG genotypes in Caucasians, and the CYP1A1 rs2606345 AC genotype in Chinese women. Clarification of the mechanisms of the associations and confirmation in other populations is warranted.
[WG#311]

563 Sowers MR, Symons JP, Jannausch ML, Chu J, Kardia SR. **Sex Steroid Hormone Polymorphisms, High-Density Lipoprotein Cholesterol, and Apolipoprotein A-1 from the Study of Women's Health Across the Nation (SWAN).** American Journal of Medicine. 2006;119(9A):S61-S68.
Primary Question:
Summary of Findings: While associations were identified with the estrogen receptor alpha and beta SNP variants and lipids in premenopausal women, these associations were not consistently observed across the four contributing race groups. Nor were the associations consistently inclusive of both HDL-c and ApoA1. These genetic variants provide limited evidence of associations with lipids that may explain the cardioprotective effect of being a premenopausal woman.
[WG#303]

564 Kardia SR, Chu J, Sowers MR. **Characterizing Variation in Sex Steroid Hormone Pathway Genes in Women of 4 Races/Ethnicities: The Study of Women's Health Across the Nation (SWAN).** American Journal of Medicine. 2006;119(9A):S3-S15.
Primary Question:
Summary of Findings: Allele frequencies differed significantly by race. There was substantial linkage disequilibrium among many of the SNPs and only a few SNPs showed significant Hardy-Weinberg disequilibrium within race. Finally, there are a number of haplotype patterns that vary according to race, including a 'yin-yang' pattern for 17HSD among Caucasian, Chinese, and Japanese women, but not among African-American women.
[WG#306]

565 Sowers MR, Jannausch ML, McConnell DS, Kardia SR, Randolph JF. **Menstrual Cycle Markers of Ovarian Aging and Sex Steroid Hormone Genotypes.** American Journal of Medicine. 2006;119(9A):S31-S43.
Primary Question:
Summary of Findings: There is evidence that two genotypes of the estrogen receptor alpha may have advanced more toward the menopause that women having other genotypes. This occurs following adjustment for chronological age, body size, and race. More rapid advancement was characterized in Daily Hormone Study enrollees using evidence of luteal activity, the menstrual cycle length, and deviations from expected hormone profiles.
[WG#305]

566 Kravitz HM, Janssen I, Lotrich FE, Kado DM, Bromberger JT. **Sex Steroid Hormone Gene Polymorphisms and Depressive Symptoms in Women at Midlife.** American Journal of Medicine. 2006;119(9A):S87-S93.
Primary Question:
Summary of Findings: Single nucleotide polymorphisms (SNPs) from 3 genes involved in the estrogen system were significantly associated with a high level of depressive symptoms in premenopausal and perimenopausal women: CYP1A1 in Caucasian and African-American women, CYP19A in Japanese women, and HSD17B1 in Chinese women. These genes may influence vulnerability to increased depressive symptoms. The specific relevant estrogen-related genetic polymorphism(s) varied by ethnicity.
[WG#308]

567 Lo JC, Zhao X, Scuteri A, Brockwell S, Sowers MR. **The Association of Genetic Polymorphisms for Sex Hormone Biosynthesis and Action with Insulin Sensitivity and Diabetes Mellitus in Women at Midlife.** American Journal of Medicine. 2006;119(9A):S69-S78.
Primary Question:
Summary of Findings: There were strong associations with genes for sex hormone biosynthesis and action with insulin sensitivity, the metabolic syndrome, and diabetes. Significant associations of CYP 19 genotypes and insulin sensitivity were observed in African-American, Caucasian, and Japanese women, while selected ESR1 and ESR2 genotypes were associated with insulin sensitivity and metabolic syndrome only in Japanese and Chinese women. The strongest associations related 17HSD genotypes (and haplotypes) to diabetes in Caucasian women, with odds ratios ranging from 4.4 to 7.5 and confidence intervals that excluded the null value.
[WG#312]

568 Sowers MR, Wilson AL, Karvonen-Gutierrez CA, Kardia SR. **Sex Steroid Hormone Pathway Genes and Health-Related Measures in Women of 4 Races/Ethnicities: The Study of Women's Health Across the Nation (SWAN).** American Journal of Medicine. 2006;119(9A):S103-110.
Primary Question:
Summary of Findings: Allele frequencies and distances differed substantially in the 4 race-specific groups evaluated, leading to variable patterns of association with health-related measures. Several SNPs were associated with multiple outcomes, and some associations were much more prominent in specific races. Importantly, women in the Genetics Study were

typical of women in the community-based SWAN sample.
[WG#349]

569 Kravitz HM, Meyer PM, Seeman TE, Greendale GA, Sowers MR. **Cognitive Functioning and Sex Steroid Hormone Gene Polymorphisms in Women at Midlife.** American Journal of Medicine. 2006;119(9A):S94-S102.
Primary Question:
Summary of Findings: Estrogen-related polymorphisms, particularly from ESR1, 17HSD, and CYP 19, were associated with differences in cognitive performance among four racial groups of mid-life women. Most of the significant findings involved either East Boston Memory Test (a test of episodic memory) or Digit Span Backward (test of working memory). Only one of the polymorphisms was associated with differences in cognitive performance on the Symbol Digit Modalities Test (a test of perceptual speed). We conclude that selected genes involved in estrogen synthesis and metabolism may be associated with performance on cognitive function tests that measure new learning in a multi-racial cohort of mid-life women.
[WG#327]

570 Randolph JF Jr, Crawford S, Dennerstein L, Cain K, Harlow SD, Little R, Mitchell ES, Nan B, Taffe J, Yosef M. **The Value of Follicle-Stimulating Hormone Concentration and Clinical Findings as Markers of the Late Menopausal Transition.** Journal of Clinical Endocrinology and Metabolism. 2006;91(8):3034-3040.
Primary Question:
Summary of Findings: FSH predicts the final menstrual period, but is not as good a predictor as menstrual bleeding patterns. Hot flashes are not predictive of the final menstrual period once we already have information on bleeding patterns and FSH.
[WG#346]

571 Brown C, Matthews KA, Bromberger JT, Chang Y. **The Relationship between Perceived Unfair Treatment and Blood Pressure in a Racially/Ethnically Diverse Sample of Women.** American Journal of Epidemiology. 2006;164(3):257-262.
Primary Question:
Summary of Findings: Our findings indicate that unfair treatment is common among midlife women and that it differs by race and ethnicity. Racial/ethnic differences in blood pressures were evident, however, these findings indicate that perceived unfair treatment was not a predictor of blood pressure.
[WG#165]

572 Gold EB, Colvin A, Avis N, Bromberger J, Greendale GA, Powell L, Sternfeld B, Matthews K. **Longitudinal Analysis of the Association Between Vasomotor Symptoms and Race/Ethnicity Across the Menopausal Transition: Study of Women's Health Across the Nation.** American Journal of Public Health. 2006;96(7):1226-1235.
Primary Question:
Summary of Findings: Transition to late perimenopause was the strongest predictor of VMS (adjusted odds ratio [AOR]=6.64, 95% CI 4.80, 9.20). VMS reporting was highest in African Americans (AOR=1.63, 95% CI 1.21, 2.20). Age (AOR=1.17, 95% CI 1.13, 1.21), lower education (AOR=1.91, 95% CI 1.40, 2.61), increasing body mass index (AOR=1.03, 95% CI 1.01, 1.04) and smoking (AOR=1.63, 95% CI 1.25, 2.12), and anxiety (AOR=3.10,

95% CI 2.33, 4.12) were significantly independently related to VMS.
[WG#169]

573 Huang MH, Luetters C, Buckwalter GJ, Seeman TE, Gold EB, Sternfeld B, Greendale GA. **Dietary genistein intake and cognitive performance in a multiethnic cohort of midlife women.** Menopause: The Journal of The North American Menopause Society. 2006;13(4):621-630.
Primary Question:
Summary of Findings: No associations between genistein intake and measures of cognitive performance were found in Japanese or Chinese participants. Our results did not support the hypothesis that genistein intake benefits cognitive performance.
[WG#205]

574 Derby CA, FitzGerald G, Lasser NL, Pasternak RC. **Application of National Screening Criteria for Blood Pressure and Cholesterol to Perimenopausal Women: Prevalence of Hypertension and Hypercholesterolemia in the Study of Women's Health Across the Nation.** Preventive Cardiology. 2006;9(3):150-159.
Primary Question:
Summary of Findings: Among 1490 perimenopausal women in the baseline sample, application of the recent ATP-III criteria show that 6.5% have LDL levels and risk profiles that would make them eligible for lifestyle modification and drug therapy. Hispanic, African American, and Caucasian women are more than three times more likely to be classified as requiring treatment than are Japanese and Chinese women. We also noted variability across sites within ethnic group, for the Caucasian and African American groups, which may reflect socioeconomic variability. Hypertension, current smoking and diabetes are the most common risk factors among these women. When perimenopausal women at baseline were classified according to JNC-VI criteria, overall, 10.3% were classified as hypertensive. The proportion hypertensive varied significantly by ethnic group, with 17% of African American, 16.5% of Hispanic, 7.5% of Caucasian, 6% of Chinese and 4% of Japanese women classified as hypertensive ($p<0.001$). As we found in the cholesterol analyses, there was also significant variation in the prevalence of hypertension across sites within ethnic group for the African Americans and Caucasians. Among women who reported current treatment for hypertension at baseline, (N=206), approximately a third (34.5%) had elevated blood pressure levels on treatment. The proportion of treated women with elevated blood pressure was highest among African Americans and Hispanics, and lowest among Caucasians and Japanese women. ($p>.001$)
[WG#96]

575 Lewis TT, Everson-Rose SA, Powell LH, Matthews KA, Brown C, Karavolos K, Sutton-Tyrrell K, Jacobs E, Wesley D. **Chronic Exposure to Everyday Discrimination and Coronary Artery Calcification in African-American Women: The SWAN Heart Study.** Psychosomatic Medicine. 2006;68(3):362-368.
Primary Question:
Summary of Findings: Exposure to “everyday” discrimination over the course of five years was significantly associated with the presence of coronary artery calcification at year five in African-American women, even after taking into account the effects of age, education and standard cardiovascular risk factors. Exposure to recent discrimination (in the 12 months preceding the coronary artery calcification assessment) was only marginally associated with

the presence of coronary artery calcification. The association between chronic "everyday" discrimination and coronary artery calcification appeared to be driven by exposure to discrimination from multiple sources, rather than exposure to racial/ethnic discrimination alone.
[WG#278]

576 Sowers MR, Crawford S, McConnell DS, Randolph JF Jr, Gold EB, Wilkin MK, Lasley B. **Selected Diet and Lifestyle Factors Are Associated with Estrogen Metabolites in a Multiracial/Ethnic Population of Women.** Journal of Nutrition. 2006;136(6):1588-1595.
Primary Question:
Summary of Findings: We found that 2- and 16á-hydroxyestrone concentrations were higher in African American and Caucasian women compared to Chinese, Japanese, and Hispanic women. Women in the highest weight quartile had lower 2-hydroxyestrone concentrations compared to women in the lowest weight quartile. Women who smoked 20 or more cigarette per day had higher 2-hydroxyestrone concentrations than non-smokers as well as increased 16á-hydroxyestrone concentrations vs. smokers although there were clearly greater differences in the 2-hydroxyestone than 16á-hydroxyestrone concentrations. Wine consumption was related to 2-hydroxyestrone concentrations while caffeine consumption was associated with 16á-hydroxyestrone concentrations, adjusted for race/ethnicity, smoking, and body size. We conclude that modifiable lifestyle and behavioral factors are independently related to estrogen metabolites and may offer a strategy for modifying disease risk. Additionally, individual metabolite levels were more informative and interpretable than their ratio.
[WG#318/316]

577 Sowers M, Jannausch ML, Gross M, Karvenen-Gutierrez CA, Palmieri RM, Crutchfield M, Richards-McCullough K. **Performance-based Physical Functioning in African-American and Caucasian Women at Midlife: Considering Body Composition, Quadriceps Strength, and Knee Osteoarthritis.** American Journal of Epidemiology. 2006;163(10):950-958.
Primary Question:
Summary of Findings: The prevalence of x-ray-defined OAK was 20%, based on the Kellgren-Lawrence criteria of 2 or greater. Women with x-ray defined OAK had slower descent downstairs and less leg strength. Almost one-third of the population reported knee joint pain and these women had slower speeds, longer ascent and descent times on stairs, but no diminution in leg strength. Women with both OAK and self-reported knee joint pain were most compromised having less leg strength, slower speeds, and greater likelihood of hand rail use
[WG#226]

578 Dugan SA, Powell LH, Kravitz HM, Everson-Rose SA, Karavolos K, Luborsky J. **Musculoskeletal Pain and Menopausal Status.** Clinical Journal of Pain. 2006;22(4):325-331
Primary Question:
Summary of Findings: One in six women at the third follow-up year of the SWAN report daily aches and pain symptoms. One in seven women reports cutting down on the amount of time she spends on work or other activities due to pain in the previous four weeks. After adjusting for demographic, medical, and lifestyle factors and depression, early

perimenopausal women still reported significantly greater functional limitations from pain than premenopausal women.
[WG#233]

579 Matthews KA, Santoro N, Lasley B, Chang Y, Crawford S, Pasternak RC, Sutton-Tyrrell K, Sowers M. **Relation of Cardiovascular Risk Factors in Women Approaching Menopause to Menstrual Cycle Characteristics and Reproductive Hormones in the Follicular and Luteal Phases.** Journal of Clinical Endocrinology and Metabolism. 2006;91(5):1789-1795.
Primary Question:
Summary of Findings:) Few risk factors differed between women who did and did not evidence of having an ovulatory cycle. Among women with evidence of an ovulatory cycle, lower hormone levels or longer cycle length with associated with a more atherogenic risk factor profile, which were reduced in number statistically after controlling for body mass index. Higher estrone levels during the follicular phase were associated with lower risk factor levels.
[WG#239]

580 Sowers MR, Jannausch M, McConnell D, Little R, Greendale GA, Finkelstein JS, Neer R, Johnston J, Ettinger B. **Hormone Predictors of Bone Mineral Density Changes during the Menopausal Transition.** Journal of Clinical Endocrinology and Metabolism. 2006;91(4):1261-1267.
Primary Question:
Summary of Findings: Over the 4-year observation period, there was a 5.6%, 3.9%, and 3.2% LS BMD loss, respectively, among pre- and early perimenopausal women who became postmenopausal (natural), postmenopausal (surgical) or late perimenopausal. This is the first study that has shown that baseline FSH concentration and 4-year FSH rise predicted 4-year spine and hip BMD loss. The manuscript identifies how much bone might be lost based on the level of FSH at the baseline and how much FSH changes over the 4-year period. The combination of baseline E2 and its 4-year change were not predictive of BMD loss. Further, neither testosterone, Free Androgen Index, nor dehydroepiandrosterone-sulfate concentrations were associated with BMD changes.
[WG#173]

581 Avis NE, Brockwell S, Colvin A. **A Universal Menopause Syndrome?** American Journal of Medicine. 2005;118(12B): 37S-46S.
Primary Question:
Summary of Findings: Vasomotor symptoms had higher prevalence among early perimenopausal women than premenopausal women and were even greater among late perimenopausal women. Other symptoms had higher prevalence among early perimenopausal women, but then leveled off. These findings suggest that vasomotor symptoms follow a different pattern than other symptoms.
[WG#298]

582 Kravitz HM, Janssen I, Santoro N, Bromberger JT, Schocken M, Everson-Rose SA, Karavolos K, Powell LH. **Relationship of Day-to-Day Reproductive Hormone Levels to Sleep in Midlife Women.** Archives of Internal Medicine. 2005;165(20):2370-2376.
Primary Question:
Summary of Findings: Sleep was best at mid-cycle and worst at the extremes (ie, early

follicular and late luteal phases) in the menstrual cycles with increases in progesterone metabolite (Pdg) excretion compatible with ovulation. Pdg was the only one of the 4 hormones (FSH, LH, E1c, Pdg) we examined that was significantly related to trouble sleeping. Mood and vasomotor (hot flashes/flushes, night sweats) symptoms and use of pain medication also were associated with more trouble sleeping, and the fall and summer seasons (compared with winter season) were associated with less trouble sleeping. Increase in progesterone may have a negative effect on sleep quality in middle-aged women who have cycles with luteal activity.
[WG#221]

583 Randolph JF Jr, Sowers M, Bondarenko I, Gold EB, Greendale GA, Bromberger JT, Brockwell SE, Matthews KA. **The Relationship of Longitudinal Change in Reproductive Hormones and Vasomotor Symptoms during the Menopausal Transition.** The Journal of Clinical Endocrinology and Metabolism. 2005;90(11):6106-6112.
Primary Question:
Summary of Findings: We conclude that, when modeled together longitudinally, FSH, but not E2, T, DHEAS, FTI or FEI, is associated with both the prevalence and frequency of vasomotor symptoms in women at midlife.
[WG#229]

584 Sowers MR, Matthews KA, Jannausch M, Randolph JF, McConnell D, Sutton-Tyrrell K, Little R, Lasley B, Pasternak R. **Hemostatic Factors and Estrogen during the Menopausal Transition.** The Journal of Clinical Endocrinology & Metabolism. 2005;90(11):5942-5948.
Primary Question:
Summary of Findings: Lower estradiol levels were associated with higher levels of PAI-1 and tPA-ag and higher FSH concentrations were associated with higher PAI-1 and Factor-VII levels. Menopause status classifications were not associated with significant differences in levels of hemostatic factors; however, hsCRP concentrations were approximately 25% higher and PAI-1 concentrations approximately 20% lower among women who initiated hormone therapy (HT) compared to non-users.
Endogenous estrogens may reduce CVD risk by modulating fibrinolytic factors, a response which could be consistent with an increased clearance of fibrinolytic factors. Notably, circulating endogenous estradiol and exogenous HT use were not related to the hemostatic factors in the same manner. Thus, conclusions derived from studies of exogenous hormones and CVD risk may not parallel or explain the effect of endogenous hormones or perimenopausal hormone changes on CVD risk.

[WG#213A]

585 Sowers MR, Jannausch M, Randolph JF, McConnell D, Little R, Lasley B, Pasternak R, Sutton-Tyrrell K, Matthews KA. **Androgens Are Associated with Hemostatic and Inflammatory Factors among Women at the Mid-Life.** The Journal of Clinical Endocrinology & Metabolism. 2005;90(11):6064-6071.
Primary Question:
Summary of Findings: Higher androgen levels were associated with less favorable levels of PAI-1, t(PA), and hsC-RP, three factors associated with greater CHD risk. Lower levels of SHBG, which impacts the amount of free testosterone androgen in the bloodstream, was associated with significantly less favorable levels of these fibrolytic and inflammatory factors.

[WG#213B]

586 Lloyd-Jones DM, Sutton-Tyrrell K, Patel AS, Matthews KA, Pasternak RC, Everson-Rose SA, Scuteri A, Chae CU. **Ethnic Variation in Hypertension Among Premenopausal and Perimenopausal Women: Study of Women's Health Across the Nation.** Hypertension. 2005;46(4):689-695.
Primary Question:
Summary of Findings: Compared with Caucasian women, African-American and Hispanic women have significantly higher prevalence of hypertension independent of other factors, whereas Chinese and Japanese women have a similar prevalence. Treatment rates vary considerably across ethnicities. In addition, we demonstrate the important joint effect of BMI and waist-hip ratio on hypertension status.
[WG#212A]

587 Brown C, Matthews KA, Bromberger J. **How Do African American and Caucasian Women View Themselves at Midlife?** Journal of Applied Social Psychology. 2005;35(10):2057-2075.
Primary Question:
Summary of Findings: Women have a positive sense of well-being at midlife. Dispositional optimism was the only significant correlate of women's self-reported sense of identity and security at midlife. African American and Caucasian women shared many similar perceptions; African American women reported a greater sense of security and identity at midlife. Further, African American women with high stress and greater financial need had higher identity and security, while the opposite was true of Caucasian women.
[WG#134]

588 Santoro N, Torrens J, Crawford S, Allsworth JE, Finkelstein JS, Gold EB, Korenman S, Lasley WL, Luborsky JL, McConnell D, Sowers MF, Weiss G. **Correlates of Circulating Androgens in Mid-Life Women: The Study of Women's Health Across the Nation.** Journal of Clinical Endocrinology and Metabolism. 2005;90(8):4836-4845.
Primary Question:
Summary of Findings: Sex hormone binding globulin (SHBG), and to a lesser extent, circulating androgens, were most strongly related to the presence of the metabolic syndrome. Relationships between adrenal androgens and physical functioning and self reported health were strongest. Sexual interest was related to both circulating testosterone and SHBG.
[WG#129]

589 Jacobs EA, Karavolos K, Rathouz PJ, Ferris TG, Powell LH. **Limited English Proficiency and Breast and Cervical Cancer Screening in a Multiethnic Population.** American Journal of Public Health. 2005;95(8):1410-1416.
Primary Question:
Summary of Findings: We have found that women who report not speaking English well or at all are less likely to receive breast and cervical cancer screening than women who speak English and that these differences are not explained by sociodemographic factors and contact with health care.
[WG#250]

590 Sternfeld B, Bhat AK, Wang H, Sharp T, Quesenberry CP Jr. **Menopause, Physical Activity and Body Composition/Fat Distribution in Midlife Women.** Medicine and Science in Sports and Exercise. 2005;37(7):1195-1202.
Primary Question:
Summary of Findings: A higher level of physical activity, particularly vigorous physical activity, is associated with a lower percentage of body fat and a smaller waist circumference. Late peri- and post-menopause is associated with lower levels of lean muscle mass.
[WG#268]

591 Powell LH, Meyer P, Weiss G, Matthews KA, Santoro N, Randolph JF Jr, Schocken M, Skurnick J, Ory MG, Sutton-Tyrrell K. **Ethnic Differences in Past Hysterectomy for Benign Conditions.** Women's Health Issues. 2005;15(4):179-186.
Primary Question:
Summary of Findings: African Americans had an 86% higher rate of elective hysterectomy, and Asian Americans had an 84% lower rate, than Caucasians. These differences were not accounted for by socioeconomic status, fibroids, obesity, or the availability of medical insurance. It is unknown whether ethnic differences represent informed choices or disparity in appropriate care.
[WG#26]

592 Agatisa PK, Matthews KA, Bromberger JT, Edmundowicz D, Chang YF, Sutton-Tyrrell K. **Coronary and Aortic Calcification in Women With a History of Major Depression.** Archive of Internal Medicine. 2005;165(11):1229-1236.
Primary Question:
Summary of Findings: We found that women who had a history of recurrent major depression were 4 times more likely to have high calcium levels of the coronaries, and 3 times more likely to show high calcium levels in the aorta. These risks were present even when we took into account the woman's age, body size, blood pressure, race and whether she smoked. Our results suggest the need for identifying and treating women with major depression in an effort to prevent progression of atherosclerosis and subsequent heart disease.
[WG#207]

593 Matthews KA, Sowers MF, Derby CA, Stein E, Miracle-McMahill H, Crawford SL, Pasternak RC. **Ethnic differences in cardiovascular risk factor burden among middle-aged women: Study of Women's Health Across the Nation (SWAN).** American Heart Journal. 2005;149(6):1066-1073.
Primary Question:
Summary of Findings: African American and Hispanic women have the highest levels of risk factors whereas Japanese and Chinese women have the lowest. However, statistical controls for socioeconomic status, obesity, cigarette smoking, cardiovascular health history, and age substantially attenuated the magnitude of the ethnic differences, suggesting that these factors play a role in understanding why ethnic groups differ in risk factors.
[WG#95]

594 Bromberger JT, Kravitz HM, Wei HL, Brown C, Youk AO, Cordal A, Powell LH, Matthews KA. **History of depression and women's current health and functioning during midlife.** General Hospital Psychiatry. 2005;27(3):200-208.

Primary Question:
Summary of Findings: Past depression significantly predicted mood symptoms, body pain, poor role functioning as a result of physical health, and poor social functioning. For somatic symptoms there was a marginally significant effect of past depression (p=.06), specifically for recurrent depression. Compared to no past depression the odds ratios of recurrent depression were higher for somatic symptoms, body pain, poor role functioning as a result of physical health, and poor social functioning. The effect of subsyndromal and single episode depression varied depending on the health outcome.
[WG#144]

595 Sowers MR, Crutchfield M, Richards K, Wilkin MK, Furniss A, Jannausch M, Zhang D, Gross M. **Sarcopenia Is Related to Physical Functioning and Leg Strength in Middle-Aged Women.** Journal of Gerontology - Medical Sciences. 2005;60(4):486-490.
Primary Question:
Summary of Findings: A substantial number of mid-aged women (about 1 in 10) had lean mass loss, in spite of an average increase in weight and this loss of lean mass was strongly related to leg strength and less strongly related to gait speed. Additionally, the associations of lean and fat mass with measures of physical function were important after adjusting for age.
[WG#231]

596 Green RS, Gold EB, Samuels SJ, Dosemeci M. **The Relation of Occupational Organic Solvent Exposure to Symptom Reporting in a Sample of White and Chinese Midlife Women.** Journal of Occupational and Environmental Medicine. 2005;47(4):410-423.
Primary Question:
Summary of Findings: Women with the highest solvent exposure were more than twice as likely to report forgetfulness as working women with no exposure. Women with low solvent exposure reportd the best general health of all groups of women.
[WG#91A]

597 Sutton-Tyrrell K, Wildman RP, Matthews KA, Chae C, Lasley BL, Brockwell S, Pasternak RC, Lloyd-Jones D, Sowers MF, Torrens JI; for the SWAN Investigators. **Sex Hormone--Binding Globulin and the Free Androgen Index Are Related to Cardiovascular Risk Factors in Multiethnic Premenopausal and Perimenopausal Women Enrolled in the Study of Women Across the Nation (SWAN).** Circulation. 2005;111(10):1242-1249.
Primary Question:
Summary of Findings: Hormone factors related to androgens are strongly related to cardiovascular risk factors in SWAN women. Thus, increases in androgens rather than decreases in estrogens may drive the change in risk of heart disease after menopause.
[WG#243A]

598 Lewis TT, Everson-Rose SA, Sternfeld B, Karavolos K, Wesley D, Powell LH. **Race, Education, and Weight Change in a Biracial Sample of Women at Midlife.** Archives of Internal Medicine. 2005;165(5):545-551.
Primary Question:
Summary of Findings: We observed significant racial differences in the effects of socioeconomic status (measured by education) on weight for middle-aged women. At baseline, African-American women at all levels of education were equally heavy, while

Caucasian women were thinner with each incremental increase in educational attainment. Over time, women of both races and all educational levels gained equally (about 1.3 pounds each year). Consequently, the absolute level differences observed at baseline persisted over time.
[WG#216]

599 Bair YA, Gold EB, Azari RA, Greendale G, Sternfeld B, Harkey MR, Kravitz RL. **Use of conventional and complementary health care during the transition to menopause: longitudinal results from the Study of Women's Health Across the Nation (SWAN).** Menopause. 2005;12(1):31-39.
Primary Question:
Summary of Findings: Rather than replacing conventional health services, women who use CAM also use more conventional health care. Additionally, women with more consistent CAM use also had increasing conventional health care contacts throughout a 2 year period.
[WG#198]

600 Weiss G, Skurnick JH, Goldsmith LT, Santoro NF, Park SJ. **Menopause and Hypothalamic-Pituitary Sensitivity to Estrogen.** Journal of the American Medical Association. 2004;292(24):2991-2996.
Primary Question:
Summary of Findings: Analysis of the patterns of hormones in early perimenopausal women who did not ovulate indicate that the brain is less sensitive to estrogen with reproductive aging.
[WG#228]

601 Cyranowski JM, Bromberger J, Youk A, Matthews K, Kravitz HM, Powell LH. **Lifetime Depression History and Sexual Function in Women at Midlife.** Archives of Sexual Behavior. 2004;33(6):539-548.
Primary Question:
Summary of Findings: Women with a lifetime history of recurrent MDD reported less sexual arousal, less physical pleasure and less emotional satisfaction within their partnered sexual relationships. Although the depression history groups did not differ in reports of sexual desire or frequency of partnered sexual behaviors, women with a lifetime history of MDD reported a higher frequency of masturbation as compared with never-depressed women. Reports of decreased physical pleasure with partnered sex and increased frequency of masturbation remained significant after controlling for current depressive symptoms, study site, marital status, psychotropic medication use, and lifetime history of anxiety or substance abuse/dependence disorders.
[WG#201]

602 Everson-Rose SA, Meyer PM, Powell LH, Pandey D, Torrens JI, Kravitz HM, Bromberger JT, Matthews KA. **Depressive Symptoms, Insulin Resistance, and Risk of Diabetes in Women at Midlife.** Diabetes Care. 2004;27(12):2856-2862.
Primary Question:
Summary of Findings: Compared to Caucasian women, African-American women with a symptom score of 16 or higher on our measure of depression showed elevated risk of developing diabetes over 3 years of follow-up that could not be explained by known diabetes risk factors. Depressed African-Americans similarly showed significant increases in insulin

resistance over time, compared to non-depressed women. Depression was not related to changes in insulin resistance among the other racial groups.
[WG#182]

603 Sternfeld B, Wang H, Quesenberry CP Jr, Abrams B, Everson-Rose SA, Greendale GA, Matthews KA, Torrens JI, Sowers M. **Physical Activity and Changes in Weight and Waist Circumference in Midlife Women: Findings from the Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2004;160(9):912-922.
Primary Question:
Summary of Findings: Weight and waist circumference increased on average, but was not related to change in menopausal status. Women who increased participation in sports/exercise and daily routine activity had less of an increase in weight and waist, while those who decreased their activity level had the greatest gains.
[WG#191]

604 Kurina LM, Gulati M, Everson-Rose SA, Chung PJ, Karavolos K, Cohen NJ, Kandula N, Lukezic R, Dugan SA, Sowers M, Powell LH, Pickett KE. **The Effect of Menopause on Grip and Pinch Strength: Results from the Chicago, Illinois, Site of the Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2004;160(5):484-491.
Primary Question:
Summary of Findings: Progression through the menopause was significantly related to decreases in pinch and grip strength in African American women only, after controlling for age, HRT use, smoking, marital status, income, education, obesity and physical activity. Age and HRT use were not associated with declines in arm strength. The most important predictor of loss of arm strength was physical inactivity.
[WG#192]

605 Bromberger JT, Harlow S, Avis N, Kravitz HM, Cordal A. **Racial/Ethnic Differences in the Prevalence of Depressive Symptoms Among Middle-Aged Women: The Study of Women's Health Across the Nation (SWAN).** American Journal of Public Health. 2004;94(8):1378-1385.
Primary Question:
Summary of Findings: Unadjusted analyses showed that rates of depression (Center for Epidemiological Studies depression scale (CES-D) score greater than or equal to 16) varied significantly by ethnicity. They were highest among African American and Hispanic and lowest among Japanese and Chinese women. Separate analyses showed that adjustments for social economic status and demographic factors in one, and health factors in another, attenuated the effects of ethnicity. The final model showed that health, physical activity, stress, and social support were each significantly associated with depression.
[WG#107]

606 Castilla RC, Bromberger JT, Zhang Y, Perel JM, Matthews KA. **Depressive symptoms are related with hemostatic factors in middle-aged women: A report from the Study of Women Health Across the Nation (SWAN).** MedUNAB. 2004;7(20):57-64.
Primary Question:
Summary of Findings: Depressed women had high levels of all four coagulation factors, ps < .05. After controlling for smoking, ethnicity, prevalent cardiovascular disease, and the use of medications (including psychotropics), depressed women still had elevated levels of

fibrinogen (mean „b SD, 304.1 „b 72.2 mg/dl vs. 290.6 „b 66.8 mg/dl, p= 0.0001) and Factor VIIc (125.2 „b 53.1ng/dl vs. 118.8 „b 35.5 ng/dl p= 0.001) levels.
[WG#180]

607 Pirraglia PA, Sanyal P, Singer DE, Ferris TG. **Depressive Symptom Burden as a Barrier to Screening for Breast and Cervical Cancers.** Journal of Women's Health. 2004;13(6):731-738.
Primary Question:
Summary of Findings: High Depressive symptom burden was independent predictor predictor of lower odds of cancer screening in women. Depression may be a modifiable factor in improving rates of cancer screening in women.
[WG#203]

608 Gold EB, Block G, Crawford S, Lachance L, FitzGerald G, Miracle H, Sherman S. **Lifestyle and Demographic Factors in Relation to Vasomotor Symptoms: Baseline Results from the Study of Women's Health Across the Nation (SWAN).** American Journal of Epidemiology. 2004;159(12):1189-1199.
Primary Question:
Summary of Findings: Significantly more African American and Hispanic women and significantly less Chinese and Japanese women reported vasomotor symptoms. Increased reporting of vasomotor symptoms was also significantly independently associated with passive smoke exposure and increased dietary cholesterol, as well as a history of premenstrual symptoms or gynecologic surgery
[WG#104]

609 Avis NE, Assmann SF, Kravitz HM, Ganz PA, Ory M. **Quality of life in diverse groups of midlife women: Assessing the influence of menopause, health status and psychosocial and demographic factors.** Quality of Life Research. 2004;13(5):933-946.
Primary Question:
Summary of Findings: Early perimenopausal women reported lower global QOL, compared with premenopausal women in unadjusted analysis, but menopausal status had little effect on QOL when analyses adjusted for other variables. Being married and having low levels of perceived stress were consistently related to global QOL across all ethnic groups. Other variables related to global QOL among some ethnic groups were education, difficulty paying for basics, self-assess health, physical activity, attitudes towards aging, and social support.
[WG#14]

610 Santoro N, Lasley B, McConnell D, Allsworth J, Crawford S, Gold EB, Finkelstein JS, Greendale GA, Kelsey J, Korenman S, Luborsky JL, Matthews K, Midgley R, Powell L, Sabatine J, Schocken M, Sowers MF, Weiss G. **Body Size and Ethnicity are Associated with Menstrual Cycle Alterations in Women in the Early Menopausal Transition: The Study of Women's Health across the Nation (SWAN) Daily Hormone Study.** Journal of Clinical Endocrinology and Metabolism. 2004;89(6):2622-2631.
Primary Question:
Summary of Findings: Older age, larger body size, and Hispanic ethnic background were all associated with a greater likelihood of having an anovulatory cycle in women in the early stages of the menopause transition. Cigarette smoking, although known to affect the age at

menopause, was not associated with major menstrual cycle alterations in this sample. [WG#128A]

611 Santoro NF. **What a SWAN can teach us about menopause.** Contemporary Ob/Gyn. 2004;49:69-79.
Primary Question:
Summary of Findings: SWAN is the first multi-ethnic longitudinal study of the menopause transition ever performed in the United States. Current models are challenging some prevailing notions about the menopause transition—that obesity protects against vasomotor symptoms, that DHEAS decreases inexorably in everyone over time, and that decreasing ovarian reserve is associated with a progressive decline in estrogen. Further elucidation of the process of menopause will allow for a distinction between 'early', 'late', 'fast' and 'slow' transitions, an improved prediction of the timing of the final menses, and an ability to forecast symptomatology and encourage preventive measures or appropriate interventions. [WG#238]

612 Randolph JF Jr, Sowers M, Bondarenko IV, Harlow SD, Luborsky JL, Little RJ. **Change in Estradiol and Follicle-Stimulating Hormone across the Early Menopausal Transition: Effects of Ethnicity and Age.** Journal of Clinical Endocrinology and Metabolism. 2004;89(4):1555-1561.
Primary Question:
Summary of Findings: Serum E2 concentrations decreased significantly with age, with a steeper decline at higher ages. FSH concentrations increased significantly with age, with a steeper increase at higher ages. Similar patterns in the decline of E2 and the increase in FSH with age were found across ethnic groups, but the levels of these hormones differed by race/ethnicity. These ethnic differences in E2 and FSH were independent of menopausal status. The effect of BMI on serum E2 and FSH levels varied by menopausal status. [WG#181]

613 Block G, Mandel R, Gold E. **On Food Frequency Questionnaires: The Contribution of Open-ended Questions and Questions on Ethnic Foods.** Epidemiology. 2004;15(2):216-221.
Primary Question:
Summary of Findings: Including an open-ended question ("Any other foods?") contributes trivially to estimates or ranking. Asking ethnic foods of Caucasian respondents contributes trivially.
[WG#135]

614 Torrens JI, Skurnick J, Davidow AL, Korenman SG, Santoro N, Soto-Greene M, Lasser N, Weiss G. **Ethnic Differences in Insulin Sensitivity and B-cell Function in Premenopausal or Early Perimenopausal Women Without Diabetes: the Study of Women's Health Across the Nation (SWAN).** Diabetes Care. 2004;27(2):354-361.
Primary Question:
Summary of Findings: Chinese Americans, Japanese Americans and African Americans are less insulin sensitive than non-Hispanic white women. The non-Mexican American Latino women have a similar level of insulin sensitivity as non-Hispanic white women. Chinese American and Japanese American women do not have the compensatory increase in beta cell function seen in African American women. Beta cell function in non-Mexican American

Women is similar to that of non-Hispanic white women.

[WG#157A]

615 Avis NE, Ory M, Matthews KA, Schocken M, Bromberger J, Colvin A. **Health-Related Quality of Life in a Multiethnic Sample of Middle-Aged Women: Study of Women's Health Across the Nation (SWAN).** Medical Care. 2003;41(11):1262-1276.
Primary Question:
Summary of Findings: In unadjusted analyses, perimenopausal women were more likely to have impaired functioning on all 5 domains. However, in analyses adjusting for other variables, menopausal status was no longer significantly related to impaired functioning. Ethnicity was also related to impaired functioning on all 5 domains in unadjusted analyses and remained significant in adjusted analyses for all domains but role-physical. In general, health and psychosocial factors for most related to all 5 health-related quality of life domains.
[WG#105]

616 Sowers M, Derby C, Jannausch ML, Torrens JI, Pasternak R. **Insulin Resistance, Hemostatic Factors, and Hormone Interactions in Pre- and Perimenopausal Women: SWAN.** Journal of Clinical Endocrinology and Metabolism. 2003;88(10):4904-4910.
Primary Question:
Summary of Findings: We showed that SHBG (which influences the amount of available testosterone and estradiol as well as have an independent hormone-like action) was associated with both hemostatic factors and insulin, and significantly modified the association of the hemostatic factors with insulin resistance. Women with the greatest insulin resistance had the lowest SHBG concentrations and highest homeostatic marker levels, even after adjusting for covariates.
[WG#99]

617 Meyer PM, Powell LH, Wilson RS, Everson-Rose SA, Kravitz HM, Luborsky JL, Madden T, Pandey D, Evans DA. **A population-based longitudinal study of cognitive functioning in the menopausal transition.** Neurology. 2003;61(6):801-806.
Primary Question:
Summary of Findings: There was a slight increase over time in cognitive functioning as measured in terms of working memory and perceptual speed. It was not significantly associated with menopausal status or progression through the menopausal transition.
[WG#171]

618 Sowers M, Crawford SL, Cauley JA, Stein E. **Association of Lipoprotein(a), Insulin Resistance, and Reproductive Hormones in a Multiethic Cohort of Pre- and Perimenopausal Women (The Swan Study).** American Journal of Cardiology. 2003;92(5):533-537.
Primary Question:
Summary of Findings: Insulin resistance was not significantly related to Lp(a) after controlling for ethnicity. Among healthy women, the direct effect of insulin resistance on Lp(a) was small compared with the indirect effects through body weight and ethnicity. Unlike race/ethnicity and body weight, estrogen, androgens and insulin resistance accounted for very little variation in Lp(a) concentrations.

[WG#98]

619 Bromberger JT, Assmann SF, Avis NE, Schocken M, Kravitz HM, Cordal A. **Persistent Mood Symptoms in a Multiethnic Community Cohort of Pre- and Perimenopausal Women.** American Journal of Epidemiology. 2003;158(4):347-356.
Primary Question:
Summary of Findings: Rates of frequent mood symptoms were higher among early perimenopausal (14.9%-18.4%) than among premenopausal (8%-12%) women. Early perimenopausal women had higher odds of irritability, nervousness, and frequent mood changes, but not feeling blue. The effect of being early perimenopausal on overall dysphoric mood was greatest among women with less than a high school/GED education and with no "possible PMS" in the previous year.
[WG#106]

620 Cain VS, Johannes CB, Avis NE, Mohr B, Schocken M, Skurnick J, Ory M. **Sexual Functioning and Practices in a Multi-Ethnic Study of Midlife Women: Baseline Results from SWAN.** Journal of Sex Research. 2003;40(3):266-276.
Primary Question:
Summary of Findings: Overall, 79% of the sample had engaged in sex with a partner in the last 6 months, and 33% considered sex to be quite or extremely important in their life. For those who engaged in sexual activity, a high level of emotional and physical satisfaction was reported. Perimenopause status was associated only with higher frequencies of masturbation and pain during intercourse. Early perimenopause had little effect on frequence of sexual practices or function, but ethnic variation remained in most measures even after adjusting for socioeconomic factors.
[WG#103A]

621 Greendale GA, Young JT, Huang MH, Bucur A, Wang Y, Seeman T. **Hip axis length in mid-life Japanese and Caucasian U.S. residents: no evidence for an ethnic difference.** Osteoporosis International. 2003;14(4):320-325.
Primary Question:
Summary of Findings: No difference in HAL between Japanese-American, Japanese women resident in the US, and Caucasian-American SWAN participants were observed at the UCLA site.
[WG#140/147]

622 Troxel WM, Matthews KA, Bromberger JT, Sutton-Tyrrell K. **Chronic Stress Burden, Discrimination, and Subclinical Carotid Artery Disease in African American and Caucasian Women.** Health Psychology. 2003;22(3):300-309.
Primary Question:
Summary of Findings: African Americans reported greater stress and had higher carotid intima-media thickness (IMT) compared to Caucasians. Among African Americans only, greater accumulated stress and unfair treatment was associated with higher IMT.
[WG#163]

623 Randolph JF Jr, Sowers M, Gold EB, Mohr BA, Luborsky J, Santoro N, McConnell DS, Finkelstein JS, Korenman SG, Matthews KA, Sternfeld B, Lasley BL. **Reproductive**

Hormones in the Early Menopausal Transition: Relationship to Ethnicity, Body Size and Menopausal Status. Journal of Clinical Endocrinology and Metabolism. 2003;88(4):1516-1522.
Primary Question:
Summary of Findings: Serum estradiol and sex hormone-binding globulin levels were lower in Japanese and Chinese women than in Caucasians, African-Americans, or Hispanics. Serum testosterone levels were lower in Hispanics than in women belonging to the other 4 ethnic groups. Serum DHEAS (dehydroepiandrosterone sulfate) levels were higher in Chinese, Japanese and Caucasian women than in African-American or Hispanic women. Serum DHEAS levels were negatively correlated with age but not menopausal status. There were no ethnic differences in serum follicle-stimulating hormone levels, but it was highly correlated with menopausal status. All hormone concentrations were significantly correlated with body composition.
[WG#126]

624 Sowers M, Luborsky J, Perdue C, Araujo KL, Goldman MB, Harlow SD. **Thyroid stimulating hormone (TSH) concentrations and menopausal status in women at the mid-life: SWAN.** Clinical Endocrinology. 2003;58(3):340-347.
Primary Question:
Summary of Findings: In women aged 42-52, the prevalence of TSH levels outside the normal range was 9.6%. Thyroid status was associated with bleeding length and self-reported fearfulness, but not with other menopausal symptoms or reproductive hormone concentrations, including Follicle Stimulating Hormone (FSH). There was a marked ethnic difference in TSH levels for which currently there is no explanation.
[WG#148]

625 Greendale GA, Huang MH, Wang Y, Finkelstein JS, Danielson ME, Sternfeld B. **Sport and Home Physical Activity Are Independently Associated with Bone Density.** Medicine and Science in Sports and Exercise. 2003;35(3):506-512.
Primary Question:
Summary of Findings: Higher leisure and home physical acitivity were independently associated with higher bone mineral density in each ethnic group. To our knowledge, this is the first demonstration of an association between home activity and BMD. It highlights the need to use physical activity scales that measure this important component of women's activity.
[WG#121]

626 Santoro N, Crawford SL, Allsworth JE, Gold EB, Greendale GA, Korenman S, Lasley BL, McConnell D, McGaffigan P, Midgley R, Schocken M, Sowers M, Weiss G. **Assessing menstrual cycles with urinary hormone assays.** American Journal of Physiology-Endocrinology and Metabolism. 2003;284(3):E521-E530.
Primary Question:
Summary of Findings: Adaptations of widely used algorithms for assessing menstrual cyclicity in midreproductive aged women were adapted to the SWAN Daily Hormone Study cohort. Robust algorithms were derived that agreed closely with subjectively rated cycles by trained observers. Inter and intra-rater agreement was also assessed. We conclude that simple methods for determining luteal function and the day of luteal transition can be applied to the study of cycles in perimenopausal women.

[WG#141]

627 Sowers MR, Greendale GA, Bondarenko I, Finkelstein JS, Cauley JA, Neer RM, Ettinger B. **Endogenous hormones and bone turnover markers in pre- and perimenopausal women: SWAN.** Osteoporosis International. 2003;14(3):191-197.
Primary Question:
Summary of Findings: In these pre- and early perimenopausal women, higher FSH concentrations, but not other serum reproductive hormone concentrations such as estradiol, are positively associated with greater bone turnover even prior to the last menstrual period.
[WG#120]

628 Jones DJ, Bromberger JT, Sutton-Tyrrell K, Matthews KA. **Lifetime History of Depression and Carotid Atherosclerosis in Middle-aged Women.** Archives of General Psychiatry. 2003;60(2):153-160.
Primary Question:
Summary of Findings: After controlling for biological and behavioral risk factors for carotid atherosclerosis, lifetime history of recurrent major depression more than doubled the risk of plaque relative to no history of major depression. Depressive symptoms or a lifetime history of a single major depressive episode afforded no increase risk for plaque. Neither depressive symptoms nor major depression were associated with intima media thickness (IMT).
[WG#158]

629 Sowers MR, Finkelstein JS, Ettinger B, Bondarenko I, Neer RM, Cauley JA, Sherman S, Greendale GA. **The association of endogenous hormone concentrations and bone mineral density measures in pre- and perimenopausal women of four ethnic groups: SWAN.** Osteoporosis International. 2003;14(1):44-52.
Primary Question:
Summary of Findings: BMD was lower in perimenopausal women than pre-menopausal women. Women with higher Follicle Stimulating Hormone (FSH) concentrations had lower BMD. Serum FSH concentrations, but not serum estradiol, testosterone, or Sex Hormone Binding Globulin (SHBG), were significantly associated with BMD in a multi-ethnic population of women. This supports the hypothesis that alterations in hormone environment are associated with BMD differences before the final menstrual period.
[WG#119]

630 Kravitz HM, Ganz PA, Bromberger J, Powell LH, Sutton-Tyrrell K, Meyer PM. **Sleep difficulty in women at midlife: a community survey of sleep and the menopausal transition.** Menopause. 2003;10(1):19-28.
Primary Question:
Summary of Findings: The stage of the menopausal transition is significantly associated with self-reported difficulty sleeping, apart from the effects of other factors. However, other factors may play an important role in contributing to the difficulty sleeping that middle-aged women going through the menopausal transition may experience and should be further investigated. Older age per se was not significantly associated with difficulty sleeping.
[WG#30]

631 Luborsky JL, Meyer P, Sowers MF, Gold EB, Santoro N. **Premature menopause in a multi-**

ethnic population study of the menopause transition. Human Reproduction. 2003;18(1):199-206.
Primary Question:
Summary of Findings: POF was reported by 1.1% of all women and varied by ethnicity. Health factors associated with POF also vary by ethnicity. This is the frist paper to examine POF in multiple ethnic groups under a single study design.
[WG#36]

632 Sampselle CM, Harlow SD, Skurnick J, Brubaker L, Bondarenko I. **Urinary Incontinence Predictors and Life Impact in Ethnically Diverse Perimenopausal Women.** Obstetrics & Gynecology. 2002;100(6):1230-1238.
Primary Question:
Summary of Findings: Twenty-five percent of midlife women experienced UI at moderate to severe levels, i.e., at least enough leakage to warrant a change of undergarments several days per week. Significant predictors of severity included Body Mass Index (BMI), perimenopausal status, diabetes mellitus, and current smoking, but not age or ethnicity.
[WG#110]

633 LaChance L, Sowers MF, Jamadar D, Hochberg M. **The natural history of emergent osteoarthritis of the knee in women.** Osteoarthritis and Cartilage. 2002;10(11):849-854.
Primary Question:
Summary of Findings: A score of 1 is part of the advancement to emergent OAK and suggests the following criteria to characterize individuals who are at an intervenable stage on the pathway toward OAKnee: age ³40, BMI ³30, and K-L score of ³1. From the prespective of both the individual and the examiner, these assessment characteristics are as reliable as the assessment of pain in the knee joint.
[WG#178]

634 Bair YA, Gold EB, Greendale GA, Sternfeld B, Adler SR, Azari R, Harkey M. **Ethnic Differences in Use of Complementary and Alternative Medicine at Midlife: Longitudinal Results From SWAN Participants.** American Journal of Public Health. 2002;92(11):1832-1840.
Primary Question:
Summary of Findings: Almost half of the women in SWAN used some kind of CAM at baseline, including herbs (18%), nutritional remedies (32%), psychological methods (20%), physical methods (20%) and folk medicine (6%). Women who reported psychological symptoms or used complementary and alternative medicines at baseline were mostly likely to be using CAM at the first year follow-up.
[WG#153]

635 Crawford SL, Johannes CB, Stellato RK. **Assessment of Digit Preference in Self-reported Year at Menopause: Choice of an Appropriate Reference Distribution.** American Journal of Epidemiology. 2002;156(7):676-683.
Primary Question:
Summary of Findings: Terminal digit for year at hysterectomy was more evenly distributed across all 10 digits than was terminal digit for year at natural menopause. The latter, however, was similar to a reference distribution based on prevalence data, suggesting that self-report is accurate. Results did not differ by ethnicity.

[WG#25]

636 Huang MH, Schocken M, Block G, Sowers M, Gold E, Sternfeld B, Seeman T, Greendale GA. **Variation in nutrient intakes by ethnicity: results from the Study of Women's Health Across the Nation (SWAN).** Menopause. 2002;9(5):309-319.
Primary Question:
Summary of Findings: Many differences in macro-and micronutrient intakes in the 5 SWAN ethnic groups were observed, which may contribute to differences in a number of outcomes of interest, such as bone mineral density, menopausal symptoms, and cardiovascular risk factor profile.
[WG#113]

637 England BG, Parsons GH, Possley RM, McConnell DS, Midgley AR. **Ultrasensitive Semiautomated Chemiluminaescent Immunoassay for Estradiol.** Clinical Chemistry. 2002;48(9):1584-1586.
Primary Question:
Summary of Findings: An ultra sensitive, semi-automated estradiol-17beta immunoassay was developed on the Bayer Diagnostics, Automated Chemiluminescent System (ACS-180) with analytical sensitivity (~1.0 pg/mL) that is adequate to quantify estradiol reproducibly in the sera of men, post-menopausal women, and children. The availability of this method has greatly facilitated the rapid analysis of large numbers of samples with good precision, low labor and reagent costs per result, and rapid turnaround times.
[WG#74]

638 Sowers M, Jannausch M, Stein E, Jamadar D, Hochberg M, Lachance L. **C-reactive protein as a biomarker of emergent osteoarthritis.** Osteoarthritis and Cartilage. 2002;10(8):595-601.
Primary Question:
Summary of Findings: Higher C-RP concentrations were associated with both prevalent and incident OAK, and were predictive after adjusting for obesity. C-RP, as a measure of an acute phase response and moderate inflammation, may permit earlier or more definitive detection of OAK or act as a predictor prior to its presentation on x-ray.
[WG#156]

639 Lasley BL, Santoro N, Randolf JF, Gold EB, Crawford S, Weiss G, McConnell DS, Sowers MF. **The Relationship of Circulating Dehydroepiandrosterone, Testosterone, and Estradiol to Stages of the Menopausal Transition and Ethnicity.** Journal of Clinical Endocrinology and Metabolism. 2002;87(8):3760-3767.
Primary Question:
Summary of Findings: There is no uniform predictable decline in circulating dehydroepiandrosterone (DHEAS) in women undergoing the menopause transition. Circulating DHEAS concentrations transiently increase in some individuals, and this transient increase is linked to the later stages of the menopause transition. Changes and variability of DHEAS in the later menopause transition differed among the different ethnic groups. The linkage of ovarian function to adrenal function underscores the importance of characterizing ovarian status when studying women, and highlights the need for further mechanistic elucidation of the pathways responsible for transient adrenal androgen activation.

[WG#166]

640 Finkelstein JS, Lee ML, Sowers M, Ettinger B, Neer RM, Kelsey JL, Cauley JA, Huang MH, Greendale GA. **Ethnic Variation in Bone Density in Premenopausal and Early Perimenopausal Women: Effects of Anthropometric and Lifestyle Factors.** Journal of Clinical Endocrinology and Metabolism. 2002;87(7):3057-3067.
Primary Question:
Summary of Findings: The traditional view is only true when bone density is considered without adjustment for ethnic variation in factors that have major effects of bone density, particularly body weight. When bone density is adjusted for these factors, it remains highest in African-American women and is lowest in Caucasians. Depending on the skeletal site, adjusted bone density in Asian women is either similar to that of African-Americans or intermediate between African-Americans and Caucasians. These data help explain some of the well known ethnic variations in fracture rates that heretofore have seemed paradoxical.
[WG#117]

641 Finkelstein JS, Sowers M, Greendale GA, Lee ML, Neer RM, Cauley JA, Ettinger B. **Ethnic Variation in Bone Turnover in Pre- and Early Perimenopausal Women: Effects of Anthropometric and Lifestyle Factors.** Journal of Clinical Endocrinology and Metabolism. 2002;87(7):3051-3056.
Primary Question:
Summary of Findings: Serum osteocalcin levels are highest in Caucasian women, next highest in African-American women, and lowest in Asian women. Urinary N-telopeptide levels are higher in Caucasian and African women than in Asian women. Interestingly, however, the pattern of ethnic variation in bone turnover is quite different from the pattern of ethnic variation in BMD, suggesting that factors other than the current state of bone turnover, such as differences in bone accretion, are responsible for ethnic variation in BMD.
[WG#118]

642 Kagawa-Singer M, Kim S, Wu K, Adler SR, Kawanishi Y, Wongvipat N, Greendale GA. **Comparison of the Menopause and Midlife Transition between Japanese American and European American Women.** Medical Anthropology Quarterly. 2002;16(1):64-91.
Primary Question:
Summary of Findings: In focus groups, consisting of European-American English speaking, Japanese-American Japanese speaking, and Japanese-American English speaking pre-, peri- and postmenopausal women, the constructions of menopause varied by ethnicity, language, and current menopausal status. This highlights the need to have culturally-appropriate research designs in order to address relevant questions that women may have.
[WG#57]

643 Villarruel AM, Harlow SD, Lopez M, Sowers M. **El Cambio de Vida: Conceptualizations of Menopause and Midlife Among Urban Latina Women.** Research & Theory for Nursing Practice: An International Journal. 2002;16(2):91-102.
Primary Question:
Summary of Findings: Latinas emphasize three themes: 1) The primacy of health and the importance of harmony and balance; 2) El cambio de vida – something you have to go

through; and 3) This time is for me: reorientation and restructuring. This life phase was marked by rediscovery and redefinition as opposed to being defined by physical symptoms. [WG#50]

644 Sampselle CM, Harris V, Harlow SD, Sowers M. **Midlife Development and Menopause in African American and Caucasian Women.** Health Care for Women International. 2002;23(4):351-363.
Primary Question:
Summary of Findings: Caucasian women were primarily concerned about menopause as it altered physical appearance to be less congruent with the societal ideal of youth. In comparison, African-American women viewed menopause as a normal, even welcome part of life. A language of emancipation and awareness of gender-bias were prominent in the women's stories regardless of menopausal status or race.
[WG#55/56/60]

645 Greendale GA, FitzGerald G, Huang MH, Sternfeld B, Gold E, Seeman T, Sherman S, Sowers M. **Dietary Soy Isoflavones and Bone Mineral Density: Results from the Study of Women's Health Across the Nation.** American Journal of Epidemiology. 2002;155(8):746-754.
Primary Question:
Summary of Findings: Soy isoflavone intake was associated with higher bone mineral density (BMD) in women of Japanese, but not Chinese, ethnicity in SWAN. (Intakes were too low in African American and Caucasian women to permit analysis of relation to BMD). These results open exciting avenues for additional study to confirm the apparent differences between Japanese and Chinese women's response to isoflavones and to explore possible mechanisms of this ethnic interaction.
[WG#114/123]

646 Pope SK., Sowers MF, Welch GW, Albrecht G. **Functional Limitations in Women at Midlife: The Role of Health Conditions, Behavioral and Environmental Factors.** Women's Health Issues. 2001;11(6):494-502.
Primary Question:
Summary of Findings: Intrinsic health variables (including diabetes, heart condition, arthritis, osteoporosis, surgical menopause) and extrinsic variables (including body size, unemployment, difficulty paying for basics, high stress) were associated with functional physical limitations.
[WG#70]

647 Sowers M, Pope S, Welch G, Sternfeld B, Albrecht G. **The Association of Menopause and Physical Functioning in Women at Midlife.** Journal of the American Geriatrics Society. 2001;49(11):1485-1492.
Primary Question:
Summary of Findings: Even at the relatively early ages of 40-55 years, approx. 20% of women self-reported limitation in physical functioning. Surgical menopause, post-menopause and the use of hormones were more frequently observed among women with "some" and "substantial" physical limitation, even after adjusting for economic status, age, body mass index, and race/ethnicity.
[WG#3/4]

648 Bromberger JT, Meyer PM, Kravitz HM, Sommer B, Cordal A, Powell L, Ganz PA, Sutton-Tyrrell K. **Psychologic Distress and Natural Menopause: A Multiethnic Community Study.** American Journal of Public Health. 2001;91(9):1435-1442.
Primary Question:
Summary of Findings: Rates of psychological distress (feeling tense, depressed, and irritable in the previous 2 weeks) were highest in early perimenopause and lower in premenopause and postmenopause. In comparison with premenopausal women, early perimenopausal women were at a greater risk of distress, even after adjustment for vasomotor and sleep symptoms, suggesting that the difference in negative mood/distress is independent of vasomotor symptoms and sleep difficulties. In adjusted analyses, odds of distress were significantly higher for whites than for the other racial/ethnic groups.
[WG#17]

649 Guyll M, Matthews KA, Bromberger JT. **Discrimination and Unfair Treatment: Relationship to Cardiovascular Reactivity Among African American and European American Women.** Health Psychology. 2001;20(5):315-325.
Primary Question:
Summary of Findings: African-American women (but not European-Americans) who report experiencing subtle forms of mistreatment due to their race show an elevated diastolic blood pressure during a laboratory task that bears similarities to an encounter with racial prejudice. This is not seen for a non-similar task. These findings suggest that racial discrimination is a chronic stressor that might impact negatively on African-American's cardiovascular health.
[WG#116]

650 Lachance L, Sowers M, Jamadar D, Jannausch M, Hochberg M, Crutchfield M. **The experience of pain and emergent osteoarthritis of the knee.** Osteoarthritis and Cartilage. 2001;9(6):527-532.
Primary Question:
Summary of Findings: Joint pain in African-American women was more likely to be associated with radiographic OAK when compared with Caucasian women. This suggests differences in these two groups in both how pain is experienced in the OAK process and in the prevalence of non-OAK related pain in knee joints.
[WG#155]

651 Matthews KA, Abrams B, Crawford S, Miles T, Neer R, Powell LH, Wesley D. **Body mass index in mid-life women: relative influence of menopause, hormone use, and ethnicity.** International Journal of Obesity and Related Metabolic Disorders. 2001;25(6):863-873.
Primary Question:
Summary of Findings: Self-reported weight adjusted for height was similar in women reported a natural menopause and in premenopausal women. However, women who had a hysterectomy were heavier and women who used hormone replacement therapy were lighter. The effects of menopause and hormone use were small relative to those of physical activity and ethnicity.
[WG#34]

652 Avis NE, Crawford SL. **SWAN: What It Is and What We Hope to Learn.** Menopause

Management. 2001;10(3):8-15.
Primary Question:
Summary of Findings: Some of the key findings reported from the cross-sectional data that will be mentioned include prevalence of symptoms, factors related to age of menopause, and attitudes towards menopause.
[WG#161]

653 Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA, Harlow SD, Skurnick J. **Factors Associated with Age at Natural Menopause in a Multiethnic Sample of Midlife Women.** American Journal of Epidemiology. 2001;153(9):865-874.
Primary Question:
Summary of Findings: Japanese women had significantly later and Hispanic women an earlier menopause. Current smokers had a significantly earlier menopause than former or never smokers, by about 1-2 years. Women who had never given birth, never used oral contraceptives, were less educated, or with a history of heart disease had significantly earlier menopause.
[WG#6/13]

654 Avis NE, Stellato R, Crawford S, Bromberger J, Ganz P, Cain V, Kagawa-Singer M. **Is there a menopausal syndrome? Menopausal status and symptoms across racial/ethnic groups.** Social Science and Medicine. 2001;52(3):345-356.
Primary Question:
Summary of Findings: Perimenopausal women, hormone users, and women who had surgical menopause reported significantly more vasomotor symptoms but not more psychosomatic symptoms. Caucasian women reported significantly more psychosomatic symptoms than other ethnic groups. African-American women reported significantly more vasomotor symptoms. The pattern of symptom reporting argues against a universal menopausal syndrome consisting of a variety of vasomotor and psychological symptoms.
[WG#15/16]

655 Young JT, Carter K, Marion MS, Greendale GA. **A Simple Method of Computing Hip Axis Length Using Fan-Beam Densitometry and Anthropometric Measurements.** Journal of Clinical Densitometry. 2000;3(4):325-331.
Primary Question:
Summary of Findings: A cross-calibration study was used to develop an accurate method to measure hip axis length (HAL) using the Hologic 4500A fan-beam densitometer.
[WG#84]

656 Sternfeld B, Cauley J, Harlow S, Liu G, Lee M. **Assessment of Physical Activity with a Single Global Question in a Large, Multiethnic Sample of Midlife Women.** American Journal of Epidemiology. 2000;152(7):678-687.
Primary Question:
Summary of Findings: Self-reported rating of physical activity level relative to other women of respondent's age does not capture the expected race/ethnic group differences in activity level, but within each race/ethnic group, physical activity is associated similarly with factors such as education and body mass index. This suggests that this global question is not appropriate for race/ethnic comparisons but is useful for ranking individual women by activity level within their race/ethnic group.

[WG#8]

657 Gold EB, Sternfeld B, Kelsey JL, Brown C, Mouton C, Reame N, Salamone L, Stellato R. **Relation of Demographic and Lifestyle Factors to Symptoms in a Multi-Racial/Ethnic Population of Women 40-55 Years of Age.** American Journal of Epidemiology. 2000;152(5):463-473.
Primary Question:
Summary of Findings: The most important factor affecting reporting of hot flashes and night sweats was menopausal status. Women who were in the early stages of menopause or had finished menopause were 2 to 4 times as likely to report these symptoms as women whose periods were still regular. In addition, these symptoms were reported more frequently by African American and Hispanic women than Caucasian women; and Japanese and Chinese women reported fewer symptoms than Caucasian women. Also, women who were less educated, smoked, or reported less physical activity than other women their age, reported significantly more symptoms than women who were more educated, non-smokers or who reported more physical activity.
[WG#7]

658 Pope SK, Sowers M. **Functional Status and Hearing Impairments in Women at Midlife.** Journals of Gerontology Series B--Psychological Sciences & Social Sciences. 2000;55(3):S190-S194.
Primary Question:
Summary of Findings: Hearing loss measurable by an audiometer is often not perceived by the participant. Self-reported hearing impairment appears to be associated with lower physical and mental functioning. Identification of self-reported hearing loss at mid-life or earlier may facilitate prevention of further hearing loss
[WG#143]

659 Adler SR, Fosket JR, Kagawa-Singer M, McGraw SA, Wong-Kim E, Gold E, Sternfeld B. **Conceptualizing menopause and midlife: Chinese American and Chinese women in the U.S.** Maturitas. 2000;35(1):11-23.
Primary Question:
Summary of Findings: Most women who had gone through menopause regarded it as natural, even a new beginning. But many who had not gone through it had concerns for its effect on them physically, emotionally, and socially.
[WG#54]

660 Sowers M, Lachance L, Hochberg M, Jamadar D. **Radiographically defined osteoarthritis of the hand and knee in young and middle-aged African American and Caucasian women.** Osteoarthritis and Cartilage. 2000;8(2):69-77.
Primary Question:
Summary of Findings: By age 40, radiographically defined osteoarthritis emerges in both the hands and knees in both black and white women. Prevalence of knee OA was higher in black females (23.1%) compared with white females (8.5%), and although prevalence of hand OA was more comparable between black (25.5%) and white females (19.2%), the joint sites affected differed. The major risk factors reported in studies of older populations are present in this younger population where OA is newly emerging.

[WG#69]

661 Hall M, Bromberger J, Matthews K. **Socioeconomic Status as a Correlate of Sleep in African-American and Caucasian Women.** Annals of the New York Academy of Sciences. 1999;896:427-430.
Primary Question:
Summary of Findings: Income and the subjective stress of lower SES were significantly related to sleep, after controlling for age, race, menstrual status and education. Lower income and moderate to severe difficulty making ends meet were significantly associated with poorer subjective sleep quality. In a separate set of analyses, difficulty in making ends meet was shown to fully mediate the relationship between income and subjective sleep quality.
[WG#87]

662 Sommer B, Avis N, Meyer P, Ory M, Madden T, Kagawa-Singer M, Mouton C, Rasor NO, Adler S. **Attitudes Toward Menopause and Aging Across Ethnic/Racial Groups.** Psychosomatic Medicine. 1999;61(6):868-875.
Primary Question:
Summary of Findings: African-America women had the most positive attitudes toward menopause, and Chinese-American and Japanese-American women had the least positive attitudes. Ethnic groups within the US vary slightly, but reliably, in their attitudes toward menopause and aging. Menopausal status was not a consistent predictor of attitude across ethnic groups.
[WG#20/29/39]

MS E-PUB AHEAD OF PRINT

IN PRESS & PROVISIONALLY ACCEPTED MANUSCRIPTS

1 Dugan SA, Crawford SL, Wente K, Waetjen EL, Karvonen-Gutierrez C, Harlow SD **The Association of Urinary Incontinence and Disability Among a Diverse Sample of Mid-life SWAN Women** Menopause
Primary Question: Does the relationship over 2 years between Urinary Incontinence (UI) and Disability, differ by UI type?
Does the relationship over 2 years vary by UI frequency?
Does the relationship over 2 years vary by UI amount?

Summary of Findings: Urinary incontinence has strong association with multiple areas of disability after two years. It is important to address UI earlier in symptom onset. Screening for mixed UI (both Stress and Urge) and UI that occurs more frequently and in larger amounts more specifically may yield better information regarding an individual's future disability risk.
[WG#975]

2 Leis AM, Jackson EA, Baylin A,Barinas-Mitchell E, El Khoudary SR, Karvonen-Gutierrez CA **Carotid Intima Media Thickness and Comorbid Cardiometabolic Dysfunction in Women: The SWAN Study** Menopause
Primary Question: Do obesity and metabolic syndrome have unique effects on cardiovascular risk?
Summary of Findings: There are a significant proportion of metabolically healthy obese individuals within SWAN. The findings from this study suggest that there is only a minimal impact of obesity on carotid artery thickness over the effect of metabolic syndrome alone.
[WG#1034]

3 El Khoudary SR, Chen X, Wang Z, Brooks MM, Orchard T, Crawford S, Janssen I, Everson-Rose SA, McConnell D, Matthews K, **Low-density lipoprotein subclasses over the menopause transition and risk of coronary calcification and carotid atherosclerosis: The SWAN Heart & HDL Ancillary studies** Menopause
Primary Question: 1) Are LDL subclasses change over the menopause transition independent of aging?
2) Are LDL subclasses during midlife associated with the presence of coronary artery calcification and carotid intima-media thickness?
3) Will these associations vary by the timing of these measures as related to the final menstrual period (FMP)?

Summary of Findings: Women experience significant atherosclerotic increases in LDL subclasses that increases their risk of having greater cIMT levels and higher CAC prevalence. The reported associations were more profound during perimenopause stage.
[WG#1081]

4 Waetjen E, Crawford S, Gajer P, Brooks, M, Gold E, Reed B, Hess R, Ravel J. **Relationships Between the Vaginal Microbiota and Genitourinary Syndrome of Menopause Symptoms in Postmenopausal Women: The Study of Women's Health Across the Nation** Menopause
Primary Question: What is the distribution of vaginal microbiota (classified by community state types-CSTs) in a diverse cohort of postmenopausal women? What are the relationships among genitourinary syndrome of menopause symptoms (vaginal dryness, vulvovaginal irritation, sexual pain, dysuria, urinary urgency), CSTs, estrogen, and vaginal atrophy biomarkers (vaginal maturation index and vaginal pH)?
Summary of Findings: While close relationships exist among estrogen, the structure of the vaginal microbiota, vaginal atrophy biomarkers (vaginal maturation index and vaginal pH), sexual pain was the only genitourinary syndrome of menopause symptom associated with the structure of vaginal microbiota and vaginal atrophy biomarkers.
[WG#977MS1]

5 Jones G, Gold EB, El Khoudary SR, Janssen I, Johnson WO **Analysis of Multivariate Binary Longitudinal Data: Metabolic Syndrome During the Menopausal Transition** Statistics and its Interface
Primary Question: (1) Our goal was to develop a complex Bayesian joint model for baseline prevalence and longitudinal incidence of MetS components and to use this model to ascertain what factors are associated with prevalence of particular MetS components at

baseline, and their incidence, if possible considering the complexity of the problem.
(2) Since we were able to accomplish (1), our next goal was to ascertain the effect of race/ethnicity on development of MetS modified by menopausal status.
(3) We also assessed the effect of particular MetS configurations at baseline on the predictive probabilities of particular MetS constellations using a Markov chain approach

Summary of Findings: Having central adiposity at baseline, alone or in combination with another MetS component, is the major factor that increases predictive probability of subsequent development of MetS. The predictive probability of development of MetS varies by race/ethnicity and is somewhat modified by menopausal transition stage. Later menopause is protective of developing component MetS.
[WG#1083]

6 Asubonteng J, Barinas-Mitchell EJ, Wisniewski S, Thurston R, Mulukutla S, Selzer F. **Metabolic Syndrome and Carotid Remodeling in Non-diabetic Middle-aged Women: The Study of Women's Health Across the Nation**
Primary Question:
Summary of Findings: The presence of MetS is associated with maladaptive remodeling of the common carotid artery in non-diabetic middle-aged women independent of select inflammatory, metabolic, and hemodynamic risk factors. Different patterns of remodeling were observed by race/ethnicity, and how these patterns of remodeling could potentially be related to the variation in risk of stroke warrant further examination
[WG#703]

BOOK CHAPTERS

1 Karlamangla AS, Shieh A, Greendale GA. **Hormones and Bone Loss Across the Menopause Transition** Vitamins and Hormones 2021;115:401-417. doi: 10.1016/bs.vh.2020.12.016. Epub 2021 Jan 29. PMID: 33706956.
Primary Question:
Summary of Findings:
[WG#1041MS]

2 Avis NE, Crawford S. **Menopause: Recent Research Findings.** The Baby Boomers Grow Up: Contemporary Perspectives on Midlife (SK Whitbourne, SL Willis) Mahwah, NJ 2006:75-109 (Chapter 4).
Primary Question:
Summary of Findings:
[WG#254]

3 Sowers MF. **Studying the Complexity of the Menopause Transition from an Epidemiological Perspective.** Textbook of Perimenopausal Gynecology. 2003:27-35.
Primary Question:

Summary of Findings: The stages of the menopausal transition can be defined based on menstrual bleeding, symptoms, hormone concentrations or health status. Integral to the menopause transition itself include duration of the transition and age at menopause as well as a marker of the intensity of the experience, observed as symptoms, shifts in hormone concentrations and ovarian function. The SWAN study provides prospective data of the menopausal transition stages using a multi-ethnic population.
[WG#184]

4 Sowers MF, Crawford SL, Sternfeld B, Morganstein D, Gold EB, Greendale GA, Evans D, Neer R, Matthews K, Sherman S, Lo A, Weiss G, Kelsey J. **SWAN: A Multicenter, Multiethnic, Community-Based Cohort Study of Women and the Menopausal Transition.** Menopause: Biology and Pathobiology (Lobo RA, Kelsey J, Marcus R.) Academic Press, San Diego. 2000:175-188 (Chapter 11).
Primary Question:
Summary of Findings: This manuscript documents the study design and study implementation of the SWAN cross-sectional study that ultimately characterized more than 16,000 women at seven sites. The manuscript also documents the study populations, design, and implementation for the cohort study that includes more than 3300 women.
[WG#73]

PRESENTED ABSTRACT WITH JOURNAL CITATION

1 Schiff M, Barinas-Mitchell E, Brooks M, Mair C, Mendez D, Naimi A, Reeves A, Hedderson M,Janssen I, Fabio A **Long-term exposure to neighborhood poverty throughout midlife and subclinical cardiovasular disease burden in subsequent years: The Study of Women's Health Across the Nation (SWAN)**
Primary Question:
Summary of Findings:
[WG#1023C]

2 Barnes M, Dugan S, Fitchett G, Janssen I, Kravitz H. **Does Religion and Spirituality Buffer the Harmful Association Between Discrimination and Stress Among Midlife Women: the Study of Women's Health Across the Nation (SWAN)**
Primary Question:
Summary of Findings: Background
Across various racial and ethnic groups, midlife women have been subjects of discrimination as a result of their gender, race/ethnicity, appearance and other factors. Furthermore, discrimination has been associated with stress, and stress has been associated with adverse health behaviors, health outcomes and poor quality of life. Additionally, religion and spirituality have been shown to have positive effects on physical and mental health.

Methods
The study used participants from the longitudinal cohort Study of Women Across the Nation (SWAN) using data from the baseline year and follow-up years one through four which span from 1996 to 2002. The initial data set consisted of 2,655 participants who had data in response to perceived stress questions in follow-up year 4. The deletion of participants

missing data for the exposure, or outcome, or potential effect modifier created a data set of 1,686 participants. A restricted analysis of African-American women who selected race or ethnicity as a reason for their perceived discrimination consisted of 171 participants.

The exposure of discrimination used the Everyday Discrimination Scale (EDS), the outcome of perceived stress used the Perceived Stress Scale (PSS), and the potential effect modifier of spiritual and religious coping used the Daily Spiritual Experience Scale (DSES). Covariates included age, race, marital status, financial strain; meaning how hard it is to pay for basics, their study site, and menopause status. The statistical methods for both the full and restricted data sets included univariate analysis, correlation analysis of the exposure, outcome, and potential effect modifier, and four multiple linear regression models.

Results
Among the entire study sample, the mean age, perceived stress score, discrimination score, and spiritual and religious coping score were 49.9 years, 7.86, 1.69, and 34.17 respectively. 65.2% stated religion was very important to them and 70% said they get a great deal of strength and comfort from their faith. Among the restricted analysis study sample, the mean age, perceived stress score, discrimination score, and spiritual/religious coping score were 50 years, 8.19, 2.25, and 37.68 respectively. 81.9% said religion was very important to them and 87.7% said they get a great deal of source and strength and comfort from their faith.
For the entire study sample, the correlation between perceived stress and every day discrimination r=0.19, and spiritual/religious coping r= -0.18 were statistically significant at P <.0001. For the restricted study sample, the correlation between perceived stress and every day discrimination r=0.28 (P <0.001), and spiritual/religious coping r= -0.27 (P <0.001) were statistically significant. In the regression model adjusted for covariates, discrimination had a positive association with perceived stress in both the full 1.84 (95% CI: 0.66,3.29; P <0.001) and the restricted samples 1.98 (95% CI: 0.66, 3.29; P 0.004). In this model, the main effect of spiritual and religious coping had a statistically significant inverse association with perceived stress in both the full -0.06 (95% CI: -0.08, -0.05; P <.0001) and restricted samples -0.08 (95% CI: -0.15, -0.03; P 0.005). There was no significant association between the interaction of discrimination and religious/spiritual coping and perceived stress in either the full or restricted sample.

Conclusions
There is a positive association between discrimination and stress among midlife women. It appears there is a stronger correlation between perceived stress and spiritual/religious coping and discrimination in the African American women, restricted, sample as compared to the entire sample. Spiritual/religious coping has an independent and inverse association/relationship with stress, however, it did not modify the effect of the association between discrimination and stress for the sample as a whole or for African American women in the restricted sample.
[WG#900A]

3 Stewart A, Brooks MM, Barinas-Mitchell E, El Khoudary S, Matthews KA, Jackson L, Magnani J. **Social role stress, reward and the American Heart Association Life's Simple 7 in midlife women: The Study of Women's Health Across the Nation** _Abstract MP56: Social Role Stress, Reward and the American Heart Association Life's Simple 7 in Midl
Primary Question:
Summary of Findings: Title: Social role stress, reward and the American Heart Association

Life's Simple 7 in midlife women: The Study of Women's Health Across the Nation
Background: American women can occupy multiple social roles, such as employee, caregiver, mother and spouse during midlife. These roles can be both stressful and rewarding, which may influence adherence to heart-healthy behaviors and risk factors. The aim of this study was to test the association of social role stress and reward with achievement of the American Heart Association Life's Simple 7 risk factors in a cohort of midlife women in the United States.
Methods: The Study of Women's Health Across the Nation (SWAN) is an longitudinal cohort study initiated in in 1996-1997 of women aged 42-52 who were premenopausal. At the fifth annual follow-up visit women first were asked if they occupied four social roles (employee, caregiver, spouse, mother), and then were asked to rate how stressful and how rewarding each occupied role was, using five point scales. Average role-related stress and reward were calculated for each woman (range 1-5). Ideal cardiovascular risk factors were assessed at the same follow-up visit using anthropometric measurement (body mass index, blood pressure), blood draw (glucose, cholesterol), and validated questionnaires (physical activity, diet and smoking). Multivariate linear regression was used for cross-sectional analyses of the number of ideal factors, using average role stress and reward as exposures. Adjusted logistic regression models were used to estimate odds of achieving the ideal level of each individual risk factor. Models were adjusted for age, race, site, education and menopause status.
Results: At the fifth SWAN follow-up visit, 1,777 women had data on all seven risk factors, and reported occupying at least one social role. The mean (standard deviation) of the number of ideal risk factors was 3.2 (1.3). Only 5% of the sample had five or more ideal factors. Women who reported greater role-related stress achieved fewer ideal factors, and a higher reward score was related to more ideal factors. A one unit higher role stress score was associated with 18% lower odds of having a healthy diet, and 18% reduced odds of having a BMI under 30. Women with a one unit higher role reward score had 56% greater odds of ideal physical activity, and 34% greater odds of being a non-smoker. Higher job stress was associated with 13% reduced odds of having a healthy blood pressure. There was no evidence of an interaction between stress and reward. Adjusting for depression and social support attenuated, but did not eliminate the significant relationships between role stress and reward and cardiovascular risk.
Conclusion: Midlife women experience stress from multiple social roles while simultaneously deriving reward from these roles, which may be beneficial for their cardiovascular disease risk factors. Understanding the influence and determinants of role stress and reward may be important when designing interventions to improve diet, physical activity and smoking behaviors in midlife women.

Authors: Emma Barinas-Mitchell, PhD; Karen Matthews, PhD;Samar El-Khoudary, MPH, PhD; Lisa Jackson, MD, MPH; Jared Magnani, MD, MSc
[WG#850E]

4 Duan C, Broadwin R, Talbott EO, Brooks M, Matthews K, Barinas-Mitchell E. **Early exposure to PM2.5 and Ozone as a predictor of subclinical atherosclerosis in late midlife women: The Study of Women's Health Across the Nation** AHA Epi/Lifestyle AHA Epi/Lifestyle, 3/2017, Portland OR,Circulation. March 2017, 135:AP067
Primary Question:
Summary of Findings:
[WG#819C]

5 Gold EB. **Vasomotor and Other Symptoms of the Menopause Transition: Prevalence and Risk Factors, Including Racial/Ethnic Differences** North American Menopause Society (NAMS) NAMS, 10/06/2016, Orlando, FL
Primary Question:
Summary of Findings:
[WG#842A]

6 Finkelstein JS, Darakananda K, Yu E, Lin D, Bouxsein M, Putman M **Differences in trabecular microstructure between African American and Caucasian Women** ASBMR ASBMR, 9/19/2016; Atlanta, GA
Primary Question:
Summary of Findings:
[WG#601E]

7 Barinas-Mitchell EJ, Broadwin R, Brooks MM, Duan C, Matthews KA., Talbott E **Exposure to PM2.5 and Ozone and Progression of Subclinical Atherosclerosis among Women Transitioning through Menopause** International Society for Environmental Epidemiology International Society for Environmental Epidemiology, 09/02/2016, Rome, Italy
Primary Question:
Summary of Findings:
[WG#819A]

8 Duan C, Broadwin R, Talbott E, Brooks M, Matthews K , Barinas-Mitchell E. **Exposure to PM2.5 and Ozone and Progression of Subclinical Atherosclerosis among Women Transitioning through Menopause: Study of Women's Health Across the Nation (SWAN)** International Society for Environmental Epidemiology International Society for Environmental Epidemiology, Sept 1-4, 2016, Rome, Italy
Primary Question:
Summary of Findings:
[WG#819D]

9 Casement M, Hall M, Bromberger J, Harlow S, Kline C, Kravitz H, He F, Matthews KA, Zheng H(. **Variability in Sleep Duration Mediates the Relationship Between Chronic Stress and Symptoms of Depression and Anxiety in Midlife Women: The SWAN Sleep Study**
Primary Question:
Summary of Findings:
[WG#769C]

10 Lee JS, Gold EB, Johnson WO, Wong J. **Synergy between Circulating Androgens and Estradiol in Relation to the Risk of Uterine Fibroids: Study of Women's Health Across the Nation (SWAN)**
Primary Question:
Summary of Findings:
[WG#782A]

11 Samuelsson L, Hall M, Rice TB, Matthews KA, Kravitz H, Krafty R, Buysse D. **Objectively-Assessed Heavy Snoring is Associated with Increased Risk for the Metabolic Syndrome and Adiposity-Related Components in a Community Sample of Midlife Women** American Psychosomatic Society 73rd Annual Meeting APS, Abstract #3057, Pg A-78

Primary Question:

Summary of Findings: OBJECTIVELY-ASSESSED HEAVY SNORING IS ASSOCIATED WITH INCREASED RISK FOR THE METABOLIC SYNDROME AND ADIPOSITY-RELATED COMPONENTS IN A COMMUNITY SAMPLE OF MIDLIFE WOMEN

Laura B. Samuelsson, M.S., Psychology, The University of Pittsburgh, Pittsburgh, Pennsylvania, Thomas B. Rice, MD, Pulmonary Disease, University of Pittsburgh Medical Center, Cranberry Township, Pennsylvania, Karen A. Matthews, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania, Howard M. Kravitz, DO, MPH, Preventive Medicine, Rush University, Chicago, IL, Robert T. Krafty, PhD, Statistics, Temple University, Philadelphia, PA, Daniel J. Buysse, MD, Psychiatry and Clinical and Translational Science, University of Pittsburgh, Pittsburgh, Pennsylvania, Martica Hall, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Snoring prevalence in women increases in midlife and may increase the risk of adverse health outcomes, including cardiometabolic diseases. However, most studies examining snoring-related risks rely exclusively on self-reported measures. No published study has examined associations among objectively-assessed snoring and cardiometabolic morbidity. This study evaluated whether objective snoring was associated with increased risk of the metabolic syndrome and its components in a community sample of midlife women.
Snoring was measured overnight by microphone in 248 participants in the SWAN Sleep Study (age=50.9¡À2.2 years, 45% African American). Snoring index (SI) was calculated as the ratio of objectively-scored snoring epochs (¡Ý2 snores per 20-sec. sleep epoch) to sleep epochs. Metabolic syndrome criteria included hypertension (SBP¡Ý130, DBP¡Ý85, anti-hypertensive medication), fasting glucose ¡Ý100 mg/dL, waist circumference ¡Ý88 cm, triglyceridemia ¡Ý150 mg/dL, and HDL <50 mg/dL. The metabolic syndrome was determined as meeting criteria for ¡Ý3 components. Odds ratios for metabolic syndrome and components were calculated using logistic regression models and adjusted for apnea-hypopnea index, age, race, depression, sleep duration, menopausal status, alcohol use, exercise, and smoking. Snoring was significantly associated with increased ORs for the metabolic syndrome in fully adjusted models (OR= 6.7, 95% CI=1.4-31.2). Snoring was not associated with increased risk for hypertension or HDL. Moderate snoring was associated with elevated glucose (OR=3.8, 95% CI=1.1-14.0). Snoring was associated with waist circumference (SI: OR=65.8, 95% CI=6.5-671.5) and elevated triglycerides (SI: OR=6.1, 95% CI=1.2-31.9). All effects persisted after adjusting for sleep apnea. Sensitivity analyses revealed that associations between objective snoring and the metabolic syndrome were found only in obese participants. Objectively assessed snoring is associated with increased cross-sectional risk of metabolic syndrome and adiposity-related components. These associations are present in obese midlife women and may be mediated by adiposity. However, the direction of associations remains unclear; prospective analyses are needed to determine whether objective snoring frequency confers risk for incident metabolic syndrome above and beyond the effect of obesity.

The Study of Women's Health Across the Nation (SWAN) has grant support from the National Institutes of Health (NIH), DHHS, through the National Institute on Aging (NIA), the National

Institute of Nursing Research (NINR) and the NIH Office of Research on Women¡¯s Health (ORWH) (Grants U01NR004061; U01AG012505, U01AG012535, U01AG012531, U01AG012539, U01AG012546, U01AG012553, U01AG012554, U01AG012495). The content of this abstract is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NINR, ORWH or the NIH.

[WG#691C]

12 Burns J, Bruehl S, Appelhans B, Dugan S, Janssen I, Kravitz H, Matthews KA, Quartana PJ. **Chronic Pain and Increases in SBP over 10 Years in Midlife Women: Tests of Direct and Mediated Relationships in SWAN**
Primary Question:
Summary of Findings: Chronic pain has detrimental effects on health and quality of life beyond the influence of pain itself. Results suggest that chronic pain from musculoskeletal or other nonmalignant conditions is related to elevated SBP, but reported findings are exclusively cross-sectional. It is also not clear whether links between chronic pain and SBP are due to unique aspects of chronic pain or are mediated by other behavioral, psychological and metabolic factors, such as depressive symptoms, physical activity, and obesity. Using longitudinal data from the Study of Women's Health Across the Nation (SWAN) (N = 1931 women), we examined with multiple regressions whether Bodily Pain scores from the SF-36 averaged over the baseline (Year 0) and first 2 SWAN annual assessments predicted increases in SBP from Year 2 to Year 12, and whether this association was mediated by depressive symptoms, physical activity and BMI at Year 6. Controlling for Study Site, Race/Ethnicity, menopausal status, education and Year 2 SBP, Bodily Pain was related significantly to Year 12 SBP (beta= .10; p<.001). Tests of mediation indicated that physical activity and BMI at Year 6 partially mediated this association (Sobel test z's > 2.87; p's <.002), whereas depressive symptoms did not. Also, the direct links between Bodily Pain and Year 12 SBP were also significant (sr's > .08; p's<.002). Thus, high bodily pain averaged over 3 years at the start of SWAN assessments was related to greater increases in SBP over a subsequent 10-year period. Mediation analyses suggest that part of this relationship was conveyed by low physical activity and high BMI assessed at Year 6, but that chronic bodily pain may still exert unique and direct effects on increases in SBP. These longitudinal data suggest a potential causal link, and suggest that chronic pain may have a meaningful impact on public health beyond disability and suffering. To the extent that chronic pain contributes to increases in SBP, a known CVD risk factor, and is often unremitting, chronic pain may emerge as a new treatment target for reducing cardiovascular morbidity and mortality. [WG#589C]

13 Reeves K, Hart V, Avis N, Crawford S, Gold EB, Habel L. **Menopausal vasomotor symptoms and mammographic density in the Study of Women's Health Across the Nation**
Primary Question:
Summary of Findings: Background: Declines in endogenous estrogen during menopause have been linked to the onset of menopausal vasomotor symptoms (VMS) and to reduced breast cancer risk. Percent mammographic density (PMD) is viewed as a marker for breast cancer susceptibility. Establishing a relationship between VMS and PMD may improve understanding of breast cancer etiology and justify future investigations of VMS and breast cancer risk.

Methods: We investigated this association in the Study of Women's Health Across the Nation (SWAN) Mammgraphic Density Substudy (N=833). Women were pre- or perimenopausal at enrollment and followed through menopause. VMS were assessed at annual SWAN visits. PMD was ascertained from routine screening mammograms. A linear mixed effects model was used to evaluate the longitudinal association between VMS and PMD.
Results: Women contributed a total of 4,748 mammograms (2-10 per woman) over a median 5.4 years of follow-up. We observed no overall association between VMS and PMD. When stratified by menopausal status, VMS was associated with lower PMD among perimenopausal women (â = -1.29%, 95%CI -2.58, -0.001) and those with unknown menopausal status due to hormone use during the study period (â = -3.62%, 95%CI -7.17, -0.07). VMS was not associated with absolute dense area in any analyses. Among women who transitioned to postmenopausal, VMS was not associated with change in PMD across the menopausal transition.
Conclusion: Although our findings do not suggest a strong association between VMS and PMD, we observed a significant effect among perimenopausal women and those using hormones during menopause.. Further prospective studies are needed to establish a relationship between VMS and breast cancer risk, and to ascertain the extent to which this relationship may be mediated by PMD.

[WG#615C]

14 Reeves K, Avis N, Hart V, Crawford S, Gold EB. **Vasomotor symptoms and breast cancer risk in the Study of Women's Health Across the Nation**
Primary Question:
Summary of Findings: Vasomotor symptoms and breast cancer risk in the Study of Women's Health Across the Nation
Katherine Reeves, Vicki Hart, Nancy Avis, Ellen Gold, Sybil Crawford

Two previous retrospective studies reported a significantly decreased breast cancer risk among women who experienced menopausal vasomotor symptoms (VMS). It is possible that VMS are a marker of declining sex hormone levels during menopause. Elevated sex hormone levels have been associated with increased breast cancer risk, suggesting that VMS may be indicative of lower susceptibility to breast cancer. We evaluated this relationship in the prospective Study of Women's Health Across the Nation (SWAN), which includes annual data on VMS and endogenous hormone levels for 3,098 women who were pre- or early peri-menopausal at enrollment. We evaluated the effect of VMS on breast cancer risk using discrete survival analysis. Over an average 11.4 years of follow-up, 129 breast cancer cases were self-reported and approximately 50% of participants reported some VMS. Women reporting VMS at any current or previous visit had a reduced risk of breast cancer compared to those never experiencing VMS (OR 0.63, 95% CI 0.39, 1.02). Results were strengthened in the subgroup of women who fully transitioned to postmenopausal during follow-up (N=80 cases, OR 0.45, 95% CI 0.26, 0.77). Associations were unchanged upon adjustment for endogenous hormone levels. VMS appear to be a marker of reduced breast cancer risk. Future research is needed to fully understand this relationship, which does not appear to be mediated by endogenous hormone levels.
[WG#615B]

15 Nackers L, Appelhans B, Dugan S, Janssen I, Kravitz H, Segawa E. **Associations between**

12-year changes in body mass index and sexual functioning in midlife women
Primary Question:
Summary of Findings: Associations between 12-year changes in body mass index and sexual functioning in midlife women
[WG#727A]

16 Lee JS, Gold EB, Johnson WO, Ward E. **Mapping the Metabolic Syndrome Components during the Menopausal Transition: A Multi-Ethnic Study**
Primary Question:
Summary of Findings: Mapping the Metabolic Syndrome Components during the Menopausal Transition: A Multi-Ethnic Study

Jennifer S. Lee, MD, PhD1; Elizabeth Ward2, MA; Wesley Johnson, PhD2; Ellen Gold, PhD3

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3 Department of Public Health Sciences, University of California Davis, Davis, CA

The constellations of components of the Metabolic Syndrome (MetS) that occur during midlife in a woman offer a composite of her cardiovascular (CV) condition and risk of CV disease. We hypothesized that the constellations of MetS components, in women who develop MetS during the menopausal transition (MT), depend on race/ethnicity, behavioral factors, and MT stage. The Study of Women Across the Nation (SWAN) followed pre-/early peri-menopausal women as they underwent the MT. MetS diagnosis meant having at least 3 of 5 components: triglyceride >150mg/dL (hTG), HDL-cholesterol < 50mg/dL (lHDL-C), fasting glucose >=100mg/dL (hGluc), waist circumference > 88cm (80cm for Asians) (Obese), and blood pressure >130/85mmHg (HTN). We included 2,367 women, who did not have MetS at baseline. In women who developed MetS (median followup = 7 years), frequencies of all observed MetS component constellations by race/ethnicity (Caucasian, African American, Hispanic, Japanese, Chinese) and MT stage (pre-, early peri-, late peri-, post-menopause, hormone therapy) were assessed at MetS diagnosis. Discrete time Cox regression models identified factors associated with risk of developing the most frequent constellations of MetS components. Models included age, study site, alcohol use, MT stage, race/ethnicity, physical activity (PA), current smoker, and fiber intake. Of the 159 women who developed MetS in the MT, 7.5% had no MetS components at baseline; the most frequent components were obesity (47%) and lHDL-C (45%). The most frequent constellations at MetS diagnosis were: Obese/hTG/lHDL-C (23% of those who developed MetS); Obese/HTN/lHDL-C (21%); Obese/HTN/hTG (14.7%); and Obese/HTN/hGluc (14.7%). In multivariable models, greater PA conferred a 20% lower risk for the two most frequent MetS constellations (HR 0.79, 95% CI 0.6-0.99 and HR 0.77, 95% CI 0.6-0.97, respectively). Current smokers had a greater risk (HR 2.64, 1.11-6.29) of having Obese/hTG/lHDL-C than non-smokers. African Americans had a lower risk (HR 0.05, 0.01-0.37) of having Obese/hTG/lHDL-C than Caucasians. Conclusion: In women who develop MetS during the MT, their specific constellations of MetS components were associated with race/ethnicity and behaviorally modifiable factors.

[WG#752B]

17 El Khoudary SR, Shields K, Budoff M, Barinas-Mitchell EJ, Janssen I, Everson-Rose SA, Matthews KA. **Heart Fat Depots, but not Peri-aortic Fat Depot are Significantly Associated with Presence and Severity of Coronary Calcification in Women at Midlife: The Study of Women¡¯s Health Across the Nation (SWAN) Ectopic Cardiovascular Fat Ancillary Study**
Primary Question:
Summary of Findings: Objective: Increasing evidence demonstrates a role of cardiovascular fat in the pathogenesis of CAD. It is unknown whether heart and vascular fat depots are related to atherosclerotic burden in women transitioning through menopause, a time of increasing CAD risk. We evaluated the cross-sectional associations between volumes of epicardial (EAT), pericardial (PAT), total heart (TAT=EAT+PAT) and peri-aortic (PVAT) adipose tissues and coronary artery calcification (CAC) in a sample of white and black midlife women. Design: CAC and cardiovascular fat depots were quantified by electron beam CT. Outcomes were presence of CAC (none vs. any: Agatston score >0), and severity of CAC (CAC Agatston score). Logistic and tobit regression were used as appropriate. Final models were adjusted for age, race, study site, menopausal status, obesity (BMI ¡Ý30 Kg/m2), systolic blood pressure, lipids, homeostasis model assessment insulin resistance index, current smoking, physical activity, comorbidity (history of hypertension, stroke, angina, heart attack or diabetes) and medication use (cholesterol lowering, antihypertensive or antidiabetic medications). Results: The study included 509 women (37.9% black; 58.4% pre-/early perimenopausal, 41.6% late peri-/postmenopausal) aged 46-59 years with data on any of the 4 fat depots. CAC was found in 47.4% of the participants. Odds ratios (95% CI) from final logistic regression models showed that higher volumes of EAT (2.43 (1.22, 4.86), PAT (1.57 (1.04, 2.37), and TAT (2.43 (1.22, 4.87), were significantly associated with higher odds of presence of CAC. Similarly, tobit regression models showed that higher volumes per 1 log-unit increase of EAT (¦Â (SE): 28.0 (10.7)), PAT (16.5 (6.6)), and TAT (30.0 (10.7)), were significantly associated with greater severity of CAC in final adjusted models. PVAT was not associated with either CAC presence or severity in final models. Conclusion: Heart fat depots (EAT, PAT and TAT), but not peri-aortic fat were independently associated with greater presence and severity of CAC in women at midlife, suggesting that local cardiovascular fat depots may contribute to CAD in midlife women. Future work is warranted to understand the underlying mechanistic pathways.
[WG#761A]

18 Mitchell DM, Lee H, Greendale GA, Cauley J, Burnett-Bowie S, Finkelstein JS. **Increasing 25-hydroxyvitamin D levels over time: The Study of Women's Health Across the Nation (SWAN).**
Primary Question:
Summary of Findings: The importance of vitamin D for bone health as well as its potential role in nonskeletal health has garnered much recent attention. Population-based studies investigating temporal trends in 25-hydroxyvitamin D (25OHD) have reported conflicting results. Our goal was thus to investigate changes in mean 25OHD levels over time and predictors of these changes in the Study of Women's Health Across the Nation (SWAN), a multi-center, racially and ethnically diverse cohort of women. 1582 women had 25OHD measured in 1998-2000 (at age 48±3 years) and again in 2009-2011 (at age 60±3 years). 25OHD was measured by liquid chromatography-tandem mass spectrometry in a single batch. Over this interval, the mean 25OHD level increased by 6.5 ng/mL (95% CI 5.9 to 7.0), from 21.5±9.8 to 28.0±11.5 ng/mL ($p<0.001$ after adjustment for age, BMI, menopausal status, study site, and season of blood draw). As expected, baseline mean 25OHD levels

varied by race/ethnicity (14.0 ng/mL (African-American), 25.4 ng/mL (Caucasian), 19.8 ng/mL (Chinese), 18.3 ng/mL (Hispanic), and 24.0 ng/mL (Japanese) (p<0.001)). However, the magnitude of increase was similar among groups, ranging from 5.3 ng/mL (Caucasian) to 8.7 ng/mL (Chinese) (Figure 1). The observed increases in 25OHD did not vary by socioeconomic status (SES), education level, or acculturation. At the 2009-2011 visit, 49% of subjects reported taking a multivitamin or vitamin D supplement; the adjusted increase in 25OHD was higher among supplement users (10.1 ng/mL vs. 3.2 ng/mL, p<0.001). Using the Institute of Medicine definition of vitamin D deficiency as 25OHD < 20 ng/mL, the proportion of deficient women decreased from 43% to 24% (p<0.001) over the interval. Among those who reported using supplements at the 2009-2011 visit, the proportion deficient decreased from 35% to 6% (p<0.001) while the proportion decreased from 51% to 39% among non-users (p<0.001). Rates of 25OHD < 20 ng/mL were significantly lower among supplement users of all racial/ethnic groups (p<0.001 for all comparisons at the 2009-2011 visit) (Figure 2). In summary, we observed an increase in average 25OHD levels as well as a decrease in the proportion of subjects with vitamin D deficiency in this observational cohort over an approximately 11 year interval. Subjects of all races/ethnicities as well as of differing SES, level of education, and degree of acculturation had similar changes. Use of vitamin supplements was a major determinant of changes in 25OHD levels.
[WG#758A]

19 Yu E, Putman M, Bouxsein. **Defects in cortical microarchitecture among postmenopausal African-American women with DM2**
Primary Question:
Summary of Findings: Purpose: Fracture risk is increased in patients with type 2 diabetes mellitus (DM2) despite normal bone mineral density (BMD). In populations comprised predominantly of Caucasians, cortical porosity is higher in diabetics than in non-diabetics. Although DM2 is more common in African-Americans than in Caucasians, it is not known whether African-American women with DM2 also have cortical bone deficits.
Methods: We measured BMD at the spine, hip, and total body by DXA, and volumetric bone density and microarchitecture at the distal radius and tibia by HR-pQCT in 22 type 2 diabetic and 78 non-diabetic postmenopausal African-American women participating in the Study of Women Across the Nation (SWAN). Microfinite element analysis was performed to estimate bone strength. We measured fasting glucose and insulin and calculated HOMA-IR.
Results: There were no significant differences in age (60 ± 3 yr vs. 59 ± 3 yr, p=NS) or weight (87 ± 20 kg vs. 84 ± 19 kg, p=NS) between the diabetic and non-diabetic groups. DXA BMD was similar in the diabetics and non-diabetics at all bone sites. At the radius, cortical porosity and cortical pore volume were greater (P<0.04 for both) and cortical BMD and tissue mineral density were lower (p<0.05 for both) in diabetics than in non-diabetics (Table). There were no differences in radius total BMD or trabecular BMD between groups. Measures of cortical bone strength were significantly lower in the diabetic women though overall failure load was similar (Table). There were no significant associations between cortical parameters and either the duration of DM2 or with HOMA-IR. In the full cohort, fasting glucose levels were associated with worse cortical porosity (r=0.25, p=0.02) and lower cortical BMD (r=-0.35, p<0.01). In particular, cortical porosity and cortical pore volume were higher among those who had fasting glucose >100 mg/dL (p<0.05 for both). There were no differences in tibial bone density or microarchitecture between diabetic and non-diabetic women. These findings remained similar after adjustment for use of diabetes or osteoporosis medications.
Conclusions: DM2 and higher fasting glucose are associated with unfavorable changes in cortical bone at the non-weight-bearing radius in postmenopausal African-American women.

These structural deficits may contribute to the increased fracture risk among women with DM2. Further our results suggest that hyperglycemia may be involved in mechanisms of skeletal fragility associated with DM2.

[WG#601C]

20 Cauley J, Finkelstein JS, Burnett- Bowie S, Greendale GA, Lian Y(, Lo J, Neer R, Randolph J, Ruppert K. **Serum 25 Hydroxyvitamin D (25(OH)D), Bone Mineral Density (BMD) and Fracture Risk across the Menopausal Transition**
Primary Question:
Summary of Findings: Circulating 25(OH)D has been linked to fracture risk but to our knowledge, there is no information on whether 25(OH)D predicts fracture over the menopausal transition or whether 25(OH)D is associated with changes in BMD over the menopausal transition. We studied 1620 women enrolled in the bone cohort of the Study of Women's Health across the Nation (SWAN). Women attended up to 11 clinic visits for an average follow-up of 9.5 years. 25(OH)D was measured at the 02 clinic visit, 2 years after enrolling in SWAN. At this time, 1207 (74.5%), were pre or early perimenopausal; 116(7.2%) late perimenopausal, 77(4.8%) postmenopausal based on bleeding patterns. Menopausal status or had hysterectomy was unknown for 220 (13%). The mean 25(OH)D (ng/ml) was 21.6 but differed markedly by race/ethnicity; White, 25.2; Black, 14.1; Chinese, 20.1 and Japanese, 23.5, p<0.000) 703 (43%) had a value < 20ng/ml. The mean age of the women at time of 25(OH)D measure was 48.5 ± 2.7, with no difference by race/ethnicity. Body mass index (BMI) (kg/m2) was greatest in Black women, 31.8; lower in White women, 28.2 and lowest in Japanese, 23.5 and Chinese, 23.2 women. Incident non-traumatic fractures that occurred after visit 02 were ascertained at each annual visit initially by self-report and later, confirmed by radiographic report. A total of 88 women experienced an incident non-traumatic fracture. Cox proportional hazard models were used to calculate the hazard ratio (HR) (95% confidence interval (CI)). Each 10 ng/ml increase in 25(OH)D was associated with a 25% lower fracture risk, even after adjusting for BMI, BMD and other important confounding variables, Table. Women with 25(OH)D >20 ng/ml had a 42% lower risk of fracture. Exclusion of women who were already postmenopausal at visit 02 had no effect. Longitudinal analyses of BMD across the menopausal transition were confined to the subset of 791 women for whom a final menstrual period (FMP) could be determoned. The mean 25(OH)D level in this subgroup (21.2 ng/ml) was similar to the total population. We compared rates of spine and hip BMD changes in women from -5 to -1 yr before the FMP, 1 year before to 2 years after FMP and 2 to 5 years after FMP. We found no association between (25(OH)D and transmenopausal bone loss. We conclude that women with higher 25(OH)D levels at midlife have a lower risk of subsequent fractures. Vitamin D supplementation may be warranted in women with 25(OH)D <20 ng/ml.

[WG#717A]

21 Green S, Malig B, Basu R, Broadwin R, Bromberger J, Derby CA, Gold EB, Green RR, Greendale GA, Jackson E, Kravitz H, Matthews KA, Ostro B, Qi L, Sternfeld B, Tomey K(. **Estimating The Effects Of Long-Term Exposure To Air Pollution On Inflammatory/Hemostatic Markers. Findings from the SWAN Study**
Primary Question:
Summary of Findings: Background: Several studies have reported associations between

long-term air pollution exposures and cardiovascular mortality. However, the biological mechanisms connecting them remain uncertain.

Objectives: Examine effects of fine particles (PM2.5) and ozone on serum markers of cardiovascular disease (CVD) risk in a cohort of midlife women.

Methods: We obtained information from women enrolled at six sites in the multi-ethnic, longitudinal Study of Women's Health Across the Nation, including repeated measurements of high-sensitivity C-reactive protein (hs-CRP), fibrinogen, tissue-type plasminogen activator antigen (tPA-ag), plasminogen activator inhibitor Type 1 (PAI-1), and Factor VIIc. We obtained residence-proximate PM2.5 and ozone monitoring data for a maximum five annual visits, calculating prior year, six-month, one-month, and one-day exposures and their relations to serum markers using longitudinal mixed models.

Results: For the 2,086 women studied, after adjusting for age, race/ethnicity, site, body mass index, smoking and recent alcohol use, PM2.5 exposures were significantly associated with blood marker levels, especially year-prior exposures for hs-CRP (20.88% increase per 10 µg/m3 PM2.5, 95% CI: 6.59, 37.10), tPA-ag (8.61%, 95% CI: 1.82, 15.86), and PAI-1 (34.64%, 95% CI: 18.70, 52.72). Findings did not change significantly after further adjustment for health and lifestyle characteristics. Significant associations with ozone were observed less but also present.

Conclusions: Our findings suggest that prior year exposures to PM2.5 and ozone adversely affect inflammatory and hemostatic pathways for cardiovascular outcomes in midlife women.

Acknowledgements:

The Study of Women's Health Across the Nation (SWAN) has grant support from the National Institutes of Health (NIH), DHHS, through the National Institute on Aging (NIA), the National Institute of Nursing Research (NINR) and the NIH Office of Research on Women's Health (ORWH) (Grants U01NR004061; U01AG012505, U01AG012535, U01AG012531, U01AG012539, U01AG012546, U01AG012553, U01AG012554, U01AG012495). The content of this abstract is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NINR, ORWH or the NIH.

[WG#618C]

22 Barinas-Mitchell EJ, Bai, L, El Khoudary SR, Asubonteng J, Thurston R, Sutton-Tyrrell K, Derby C. **Extent of Subclinical Atherosclerosis and Associations with Cardiovascular Disease Risk Factors Vary By Race/Ethnicity in Late Midlife Women: The Study of Women's Health Across the Nation.** _EPI NPAM 2013 Scientific Sessions, March 19-22, 2013, New Orleans, LA.
Primary Question:
Summary of Findings: Subclinical atherosclerosis indices, such as carotid artery intima-media thickness (IMT) and plaque, have been linked to future CHD, MI and stroke events, are more prevalent in postmenopausal women and vary by race/ethnicity. In most studies, African-American women have greater IMT (especially in the common carotid artery; CCA) and larger carotid arterial adventitial diameter (AD; a measure of vascular adaption). These differences may reflect the higher levels of CVD risk factors in African-Americans. However,

population-based studies have reported lower carotid plaque and coronary calcification in African-American women compared to Caucasian women. Less is known about late midlife women of other racial/ethnic groups including Hispanic and Chinese women. We hypothesized that, in late midlife women, there are racial/ethnic differences in subclinical atherosclerosis and in the associations between these measures and CVD risk factors. Methods: Participants (n=1406; 85% postmenopausal; mean±SD age 60±3 years) from the Study of Women's Health Across the Nation, who were free of CVD and had CCA-IMT, AD or presence of carotid plaque assessed at the 12th annual visit, were included in these analyses. Multivariable regression models were run to determine the relationship between race/ethnicity and CCA-IMT, AD (linear) and plaque (logistic) adjusted for CVD risk factors (Table 1). Results: Compared to Caucasian women, CCA-IMT was greater in African-American, AD greater in African-American and Chinese women and plaque prevalence was lower in African-American and Hispanic women independent of CVD risk factors. Independent correlates of CCA-IMT were age and SBP for all groups and BMI and glucose in Caucasian and Chinese women only. Independent correlates of AD were SBP, BMI and height in Caucasian, African-American and Chinese women, insulin and antihypertensive medications in African-American and glucose in Caucasian women. Smoking and lower education were independently associated with plaque in African-American women (age, smoking and glucose in Caucasian women).
Conclusions: In this cross-sectional study of late midlife women, the extent of subclinical atherosclerosis and associations with CVD risk factors vary by race/ethnicity, indicating that vascular adaptation to CVD risk factors may differ across racial/ethnic groups.

Table 1: Markers of subclinical atherosclerosis by race/ethnicity in late mid-life women

	N (%)	CCA-IMT (mm)	AD (mm)	Plaque, N(%)
Caucasian	712 (50.6%)	0.78±0.11	7.09±0.63	327 (45.9%)
African-American	417 (29.7%)	0.83±0.12*	7.35±0.72**	155 (37.2%)*
Chinese	189 (13.4%)	0.76±0.11	7.21±0.59*	92 (48.7%)
Hispanic	88 (6.3%)	0.80±0.11	7.04±0.63	24 (27.3%)*
Total	1406	0.79 ±0.12	7.18 ±0.66	598 (42.5%)

*p<0.001, **p<0.05 compared to Caucasian women adjusting for age, site, SBP, BMI, height (for AD model only), current smoking, HDL-C, triglyceride levels, glucose, insulin, antihypertensive and lipid lowering medications, menopausal status and education.
[WG#694A]

23 Hale L, Troxel W, Matthews KA, Kravitz H, Hall M. **Are Immigration Status and Acculturation Associated with Sleep Complaints? An Investigation of Chinese, Japanese, and Hispanic Women in the Study of Women's Health Across the Nation (SWAN).**
Primary Question:
Summary of Findings: Study Objectives: Mexican immigrants to the US report longer sleep duration and fewer sleep complaints than their US-born counterparts, but the reasons underlying this "healthy immigrant effect" remain uncertain. To investigate whether this effect extends to other immigrant groups, we examined whether prevalences of self-reported sleep complaints are lower among Hispanic, Chinese, and Japanese immigrant women compared to their US-born ethnic counterparts. We also examined whether (1) sociodemographic and psychosocial characteristics and (2) language acculturation accounted for these differences.
Design: Cross-sectional observational study.
Setting: Multi-site study in Oakland, Los Angeles, and Newark.

Participants: Hispanic (n=197), Chinese (n=230), and Japanese (n=275) women (mean age=46) participating in the Study of Women's Health Across the Nation (SWAN), 414 of whom are first-generation immigrants.
Interventions: None
Measurements and Results: Questionnaires were used to assess sleep complaints, race/ethnicity, immigrant status, language acculturation (use of English language), and sociodemographic and psychosocial variables. Approximately one quarter of first-generation immigrant women reported any sleep complaint compared to 37% of those who were US-born. Multivariable adjusted logistic regression analyses showed that first-generation immigrants had lower odds of reporting any sleep complaints (OR = 0.45, p<.001), compared to US-born women of the same race/ethnic group. Women without full language acculturation had lower odds of reporting sleep disturbances; adjustment for language acculturation statistically mediated 51.5% (95% CI 34.4-98.2) of the association between immigrant status and sleep complaints.
Conclusion: Hispanic, Chinese, and Japanese immigrants were less likely to report sleep complaints than their US-born ethnic counterparts; a finding largely explained by level of acculturation.
[WG#529A]

24 Thurston R, Mackey R, Matthews KA. **Childhood and adulthood socioeconomic status in relation to adult subclinical cardiovascular disease in The Study of Women's Health Across the Nation**
Primary Question:
Summary of Findings: Background: The relation between low adult socioeconomic status (SES) and cardiovascular disease (CVD) is well-known. However, life-course perspectives underscore the importance of childhood SES to the development of CVD disparities. The relative contributions of childhood and adult SES to CVD are not understood. Examining these relations using subclinical CVD indices capturing early disease development is useful to avoiding SES biases in event presentation and detection. The study aim was to examine the relative relations of childhood and adult SES to carotid intima media thickness ((IMT), an index of atherosclerosis) and brachial artery flow mediated dilation ((FMD), an estimate of endothelial dysfunction).

Methods: Aims were tested among Pittsburgh participants of the Study of Women's Health Across the Nation (SWAN), a prospective study of midlife women (N=245, 30% AFRICAN AMERICAN, 70% CAUCASIAN). Relations between childhood SES (maternal and paternal education, home ownership, family being on public assistance) and adult SES (education, income, difficulty paying for basics) in relation to each subclinical CVD index were examined in linear regression models with one adult and one childhood SES measure (covariates: age, race, BMI, SBP, smoking, and for FMD, baseline lumen diameter).

Results: For IMT, lower childhood SES (maternal education: <= vs. >high school: b(SE)=.03(.01),p=0.04; being on public assistance: b(SE):.03(.02),p=.04), but not adult SES, was related to higher IMT. For FMD, adult SES (current education < vs. >= college: b(SE)=-.17(.07), p=.01), but not childhood SES, was related to poorer FMD. An interaction between race and current financial strain (p<.05) indicated that difficulty paying for basics was associated with somewhat poorer FMD among AFRICAN AMERICANS (b(SE)=-.23(.12),p=.06) but not CAUCASIANS (b(SE)=-.04(.09),p=.63) There were no interactions between childhood and adult SES.

Conclusions: Low childhood SES may be most important to processes that develop over a lifetime (e.g., atherosclerosis). Conversely, low adult SES may be most relevant to dynamic processes (e.g., acute endothelial dysfunction). These results point to the specificity of the timing of adverse exposures in relation to the timing of differing CVD processes.

SWAN has grant support from the NIH, DHHS, through the NIA, the NINR, the NHLBI, and the NIH ORWH (Grants NR004061; AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, AG012495, HL065591). The content of this abstract is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NINR, ORWH, NHLBI. or the NIH.
[WG#390A]

25 Gold E, Crawford S, Lin WT, Beattie M, Chen L, Rosen M. **Impact of Smoking on the Age at Natural Menopause in BRCA1/2 Mutation Carriers in Northern California.** American Society for Reproductive Medicine. October 15-19, 2011, Orlando, FL.

Primary Question:

Summary of Findings: Title: IMPACT OF SMOKING ON THE AGE AT NATURAL MENOPAUSE IN BRCA1/2 MUTATION CARRIERS IN NORTHERN CALIFORNIA

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Objective: Timing of fertility preservation and risk-reducing salpingo-oophorectomy is of great concern for BRCA1 and BRCA2 mutation(BRCA1/2) carriers. Our preliminary analyses suggested BRCA1/2 carriers may have an earlier age at natural menopause, consistent with findings from a recent study relating BRCA1 to occult primary ovarian insufficiency. The aim of this study was to examine the association of BRCA1/2 and age at natural menopause, and possible effect modification of smoking,a possible exogenous modifiable risk factor.

Design: Retrospective study with historical control

Materials and Methods: 166 Caucasian BRCA1/2 carriers in Northern California with natural menopause or still menstruating were identified within UCSF Cancer Risk Program registry and compared to 765 Caucasian women in Northern California included in the Study of Women's Health Across the Nation (SWAN) cohort. We compared median age at natural menopause and any effect modification of smoking,using the Kaplan-Meier approach for unadjusted analyses and Cox proportional hazards regression analyses to adjust for confounding factors.

Results: The median age at natural menopause in BRCA1/2 carriers was statistically significantly earlier than normal population (48 vs 53years,log-rank p-value<0.0001). The

unadjusted hazard ratio of natural menopause was 3.94 (95% confidence interval 2.34, 6.65), 4.05 (2.30, 7.12) after adjusting for smoking and oral contraception pills. For BRCA1/2 carriers who were current heavy smokers(¡Ý20cigarettes/day), the median age at natural menopause was 45.5, significantly earlier than never or past smokers or current light smokers (<10, 10-19 cigarettes/day)(log-rank p-value=0.0021).

Conclusions: BRCA1/2 is associated with significantly earlier age at natural menopause, and heavy smoking poses additional risk for even earlier menopause. As the relationship between menopause and end of natural fertility is considered fixed, this finding of earlier menopause and the impact of smoking is important for counseling BRCA1/2 carriers and is suggestive of the underlying mechanism.

Support: NIH/DHHS grant AG012554
[WG#612A]

26 McClure CK, Schwarz EB, Conroy MB, Tepper PG, Janssen I, Sutton-Tyrrell K. **Lactation and Future Maternal Visceral Adiposity.** International Diabetes and Obesity Forum. Oct 21-23, 2010, Athens, Greece.

Primary Question:

Summary of Findings: Introduction

Women gain visceral fat during pregnancy. Whether post-partum behaviors, such as lactation, modify women¡¦s subsequent body composition is unknown.

Purpose

To examine the extent to which lactation was associated with visceral adiposity in a sample of US women.

Methods

Cross-sectional analysis of 351 women aged 45-58, who were free of clinical cardiovascular disease and had not used oral contraceptives or hormone replacement therapy in the three months prior to enrollment in the Study of Women¡¦s Health Across the Nation-Heart Study (2001-2003). History of lactation was self-reported. Computed tomography was used to precisely measure abdominal adiposity.

Results

On average, women were 51 years old and 19 years had passed since their last birth. Among premenopausal/early peri-menopausal mothers, those who did not breastfeed had 28% greater visceral adiposity (95%CI:11-49, p=0.001), 20% greater visceral to total abdominal fat ratio (95%CI:2-40, p=0.03), 4.7% greater waist-hip ratio (95%CI:1.9-7.4, p<0.001), and 6.49cm greater waist circumference (95% CI:3.71-9.26, p<0.001) than mothers who consistently breastfed in models adjusting for study site, age, parity, years since last birth, socioeconomic, lifestyle, and family history variables, early adult BMI and current BMI. In comparison to women who were nulliparous, mothers who consistently breastfed had no more visceral fat. In contrast, premenopausal/early peri-menopausal mothers who had not breastfed had significantly greater visceral adiposity (42%(95%CI:17-70), p<0.001), ratio of visceral to total abdominal adiposity (32%(95%CI:10-60), p=0.004), waist circumference (6.15cm(95%CI:2.75-9.56), p<0.001), and waist-hip ratio (3.7%(95%CI:0.69-6.8), p=0.02) than nulliparous women. No significant relationships were observed among late peri-menopausal/postmenopausal women.

Conclusions
Mothers who did not consistently breastfeed were significantly more likely to retain metabolically-active visceral fat than mothers who consistently breastfed. These results provide a potential physiologic basis for prior findings that women who do not breastfeed their children are at increased risk for diabetes, the metabolic syndrome, and cardiovascular disease.
[WG#511B]

27 Everson-Rose S, Clark C, Wang Q, Guo H, Mancuso P, Goldberg J, Bromberger J, Kravitz H, Sowers M. **Depressive symptoms are associated with adiponectin levels in middle-aged women.** Powell Center Women's Health Conference. Sept. 20, 2010; Minneapolis, MN.
Primary Question:
Summary of Findings: Depressive symptoms are associated with adiponectin levels in middle-aged women.

Susan A. Everson-Rose, PhD; Cari Jo Clark, ScD; Qi Wang, MS; Hongfei Guo, PhD; Peter Mancuso, PhD; Jared Goldberg, BS; Howard Kravitz, DO; Joyce T. Bromberger, PhD; MaryFran Sowers, PhD.

Depressive symptoms are associated with obesity, diabetes, and cardiovascular diseases (CVD). Mechanisms underlying these associations are not fully understood, but evidence suggests inflammatory processes may be particularly important. Adipocytokines play a critical role in obesity and obesity-related disorders, including type 2 diabetes, insulin resistance, dyslipidemia, hypertension, and coronary artery disease. Adiponectin is the most abundant anti-inflammatory adipocytokine secreted by fat cells. Very few studies have investigated whether depression is related to adiponectin, though this is a biologically plausible pathway linking depression to obesity and CVD risk. This study examined the association between depressive symptoms, assessed by the 20-item Center for Epidemiologic Studies Depression scale (CES-D), and circulating levels of adiponectin in a cohort of 581 women (38.7% black; 61.3% white; mean (SD) age = 45.6 (2.5) years). Participants were from the Study of Women's Health Across the Nation. Adiponectin was measured from stored serum specimens and assayed in duplicate using a commercially available enzyme linked immunosorbent assay. The mean (SD) adiponectin value was 9.90 (4.92) ìg/mL [range, 1.7 to 30.0; median, 8.92 ìg/mL]. Values were log-transformed for analyses due to skewness of the distribution. An adjusted linear regression model showed that compared to women with few depressive symptoms, those with elevated depressive symptoms (CES-D >16) had 9.6% lower median adiponectin levels (95% CI, 1.4 to 17.0%), controlling for age, race, sex hormone binding globulin, smoking, alcohol consumption, diet and physical activity. This association was somewhat reduced with further adjustment for body mass index [estimate for CES-D > 16 = -0.082; SE = .043; p=0.057]. This study provides unique epidemiologic evidence of an association between depressive symptoms and circulating adiponectin levels in healthy, middle-aged women. Findings suggest that the pathway between depression and obesity, CVD and related disorders may include critical obesity-related inflammatory markers. [Supported by NIH/DHHS grants HL091290, AG012505, AG012546, MH59770, AG17719.]
[WG#534B]

28 Wildman R, Sowers M, Ogorodnikova A. **Nutritional Factors associated with Benign vs. At-Risk Obesity in Menopausal Women: SWAN.** American Heart Association Council on Epidemiology and Prevention. 03/2010, San Francisco, CA.
Primary Question:
Summary of Findings: Background: Obese (BMI ¡Ý30 kg/m2) individuals without cardiometabolic abnormalities have no apparent increased risk of CVD in comparison to non-obese individuals. Why the ¡°benign¡± obese remain free of CVD risk factors and CVD events remains unclear. We hypothesized that diet patterns that were higher in antioxidants, fiber, fruits and vegetables, and lower in saturated and trans fats would be associated with greater odds of benign obesity.

Methods: Cross-sectional analyses of obese (BMI ¡Ý30 kg/m2) black and white SWAN women, aged 42-52, who were categorized as ¡°at-risk¡± or ¡°benign¡± based on the presence (at-risk) or absence (benign) of any of the following at baseline: 1) blood pressure ¡Ý130/85 mmHg or antihypertensive medications: 2) HDL<50 mg/dL; 3) triglycerides ¡Ý150 mg/dL; 4) glucose ¡Ý100 mg/dL or antidiabetes medications; and 5.) C-reactive protein >5.6 mg/dL (top quartile). Usual dietary intake over the previous year was assessed with the Block food frequency questionnaire at baseline.

Results: Of the 2,242 women with complete risk factor data, 39% (n=884) were obese with 9% (n=80) of obese having the benign phenotype. Benign obese women were more likely to be white and had a lower mean BMI (34.0 vs. 36.0 and 38.1 kg/m2, respectively) and waist circumferences (95.7 vs. 101.1 and 108.4 cm, respectively) compared to those obese women with 1-2 or ¡Ý3 risk factors. Energy intake did not differ significantly between the three groups (1680 vs. 1821 and 1855 kcal/day, respectively), nor did energy-adjusted daily intake of saturated (11.9 vs. 12.5 and 12.4 g/1,000 kcal, respectively) or trans fats (3.1 vs. 3.5 and 3.5 g/1,000 kcal, respectively). Benign obese women had significantly higher energy-adjusted daily intakes of vitamin B6 (0.83 vs. 0.77 and 0.73 mg/1,000 kcal, respectively) vitamin E (5.0 vs. 4.5 and 4.5 mg ¦ÁTE/1,000 kcal, respectively), dietary fiber (6.5 vs. 5.8 and 5.7 g/1,000 kcal, respectively) and vegetables (1.5 vs.1.2 and 1.3 servings/d, respectively) with significantly less meat servings (1.6 vs.1.9 and 1.7 servings/d, respectively). After adjustment for important covariates including BMI, each standard deviation higher energy-adjusted daily intake of Vitamin E, Vitamin B6, and fiber was associated with 42% (OR 1.42; 95% CI 1.15-1.75), 27% (1.27; 1.01-1.61), and 28% (1.28; 1.01-1.61) greater odds of having the benign phenotype, respectively. Higher energy-adjusted intake of omega-3 fatty acids was associated with benign obesity (OR1.27; 95% CI 1.01-1.61). Additionally, higher intakes of vitamin B1, folate and iron were significantly associated with benign obesity in blacks but not whites.

Conclusions: Among obese women at mid-life, higher intake of vitamin B6, vitamin E, and fiber may contribute to normal CVD risk factor levels despite adiposity. These data highlight the potential contribution of diet patterns independent of energy intake or body weight. [WG#519A]

29 Tomey K, Sowers M, Brines S, Schlemmer E. **Neighborhood poverty and physical functioning-related variables in mid-life rural and urban women living in the Midwestern United States.** Health Over the Life Course Conference in London, Ontario.
Primary Question:
Summary of Findings: No free-standing abstract will be published for this conference, just

the manuscript (see accompanying concept proposal). I will be giving an oral presentation based on the contents of the manuscript.
[WG#506A]

30 Greendale GA, Huang M, Wight RG, Seeman T, Luetters C, Avis NE, Johnston J, Karlamangla AS. **Effects of the Menopause Transition and Hormone Use on Cognitive Performance in Mid-Life Women.** The North American Menopause Society, 20th Annual Meeting. 09/30/2009, San Diego, CA.
Primary Question:
Summary of Findings: Background: There is almost no longitudinal information about measured cognitive performance during menopause transition [MT].
Methods: We studied 2362 participants from the Study of Women• fs Health Across the Nation for four years. Major exposures were time spent in MT stages, hormone use prior to the final menstrual period (FMP) and postmenopausal current hormone use. Outcomes were longitudinal performance in three domains: processing speed (Symbol Digit Modalities Test [SDMT]), verbal memory (East Boston Memory Test [EBMT]) and working memory (Digit Span Backward [DSB]).
Results: Premenopausal, early perimenopausal and postmenopausal women scored higher with repeated SDMT administration ($p < 0.0008$), but scores of late perimenopausal women did not improve over time ($p=0.2$). EBMT delayed recall scores climbed during pre- and postmenopause ($p<0.01$), but did not increase during early or late perimenopause ($p >0.14$). Initial SDMT, EBMT-immediate and EBMT-delayed tests were 4-6% higher among prior hormone users ($p< 0.001$). On the SDMT and EBMT, compared to the premenopausal referent, postmenopausal current hormone users demonstrated poorer cognitive performance ($p < 0.05$) but performance of postmenopausal non-hormone users was indistinguishable from that of premenopausal women.
Conclusions: Consistent with transitioning women• fs perceived memory difficulties, perimenopause was associated with a decrement in cognitive performance, characterized by women not being able to learn as well as they had during premenopause. Improvement rebounded to premenopausal levels in postmenopause, suggesting that MT-related cognitive difficulties may be time-limited. Hormone initiation prior to the FMP had a beneficial effect whereas initiation after the FMP had a detrimental effect on cognitive performance.

Greendale GA, Huang MH,Wight RG, Seeman TE, Luetters C, Avis NE, Johnston J, Karlamangla AS. Effects of the menopause transition and hormone use on cognitive Performance in mid-life women. Neurology 2009; 72:1850-57

ACKNOWLEDGMENTS

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[WG#376B]

31 Diem S, Cauley J, Bromberger J, Taylor B, Paudel M, Finkelstein J, Ensrud K. **Use of selective serotonin reuptake inhibitors and bone mineral density in middle-aged women.** American Society for Bone and Mineral Research. Denver, 9/11-9/15/2009.
Primary Question:
Summary of Findings: Use of selective serotonin reuptake inhibitors is associated with lower bone mineral density in middle-aged women
Diem S, Bromberger J, Cauley J, Paudel M, Taylor B, Finkelstein J, Ensrud K.

Recent work has suggested a possible detrimental effect of selective serotonin receptor inhibitors (SSRIs) on bone mineral density (BMD), although most work has been limited by a focus on the elderly. To test the hypothesis that middle-aged women who use SSRIs have lower BMD, we assessed current use of SSRIs using an interviewer-administered questionnaire and measured lumbar spine and hip BMD in a cohort of 1755 women (mean age 50.0 yrs) attending the 5th exam of the Study of Women's Health Across the Nation (SWAN), a prospective cohort study of women in mid-life. We verified medication use from medication containers and classified type of medication from product brand or generic names obtained from containers using a computerized medication dictionary. We categorized women according to their reported SSRI use as users (use at least twice a week in the last month) vs. non-users. Individual drug use within the user category included fluoxetine, paroxetine, sertraline, fluvoxamine, and citalopram. Users of other classes of antidepressants at the visit were excluded. Depressive symptoms were measured using the CES-D. Mean BMD at the lumbar spine, hip, and femoral neck were calculated by category of SSRI use. All results were adjusted for the following characteristics measured at the visit: age, site, ethnicity, BMI, menopausal stage, and CES-D score.

	Mean BMD (95% Confidence Interval), g/cm2		
BMD site	Non-user (n=1628)	SSRI user (n=127)	p-value
Lumbar spine	1.059 (1.052, 1.065)	1.034 (1.011, 1.058)	0.04
Total hip	0.951 (0.946, 0.956)	0.931 (0.912, 0.951)	0.05
Femoral neck	0.828 (0.823, 0.833)	0.805 (0.786, 0.824)	0.02

Use of SSRIs in this cohort is associated with lower BMD at the lumbar spine and hip, after controlling for several potentially confounding factors. Prospective analyses of rate of change in BMD in SSRI users vs. non-users are necessary to confirm these findings.
[WG#411A]

32 Crawford SL, Santoro N, Laughlin GA, Sowers MF, McConnell D, Sutton-Tyrrell K, Weiss G, Vuga M, Laskey BL. **An inflection of circulating DHEAS is related to ovarian status during the menopausal transition.** Endocrine Society's annual meeting, Washington, DC, June 10-13, 2009.
Primary Question:
Summary of Findings: SWAN (the Study of Women's Health Across the Nation) has previously reported a rise in circulating DHEAS during the late menopausal transition. We now expand that original study to include ten consecutive annual measurements on 2886 women from five ethnic groups who were 42-52 years of age on entry into the study. Women with a hysterectomy and/or bilateral oophorectomy and observations concurrent with hormone use were excluded and data were adjusted for ethnicity, clinical site, smoking (including passive smoke exposure), weight, and height. Cross-sectional analysis of covariance of circulating dehydroepiandrosterone sulfate (DHEAS) in premenopausal women at baseline

indicates a uniform decline in circulating DHEAS with increasing age. In contradistinction, longitudinal linear mixed modeling including observations from premenopause through late postmenopause (more than 24 months past the final menses, FMP) identified a significant late-transition rise in DHEAS when women were analyzed by ovarian status. An average increase in mean circulating DHEAS was observed between early perimenopause and late perimenopause (3.95%, p=0.003) when the entire cohort was analyzed. Levels tended to plateau between late perimenopause and early postmenopause (within 24 months LMP) (p>0.05) but then declined significantly (p=0.03) between early and late postmenopause (p=0.03). Levels were similar between early perimenopause and late postmenopause indicating the observed rise in DHEAS was transient and related to changes in ovarian function. Of 1423 women with at least one observation during the late transition or early postmenopause, 1202 (84.5%) had an estimated within-woman increase in DHEAS during the menopausal transition. The proportion of women exhibiting a rise and the trajectory of circulating DHEAS rise was similar for all five ethnic groups. Women who exhibited a detectable rise in DHEAS were more likely to be early perimenopausal at baseline with higher mean baseline DHEAS. Women with no detectable rise in DHEAS did not differ significantly from those with a DHEAS rise with respect to age, smoking, BMI, circulating estradiol or circulating testosterone. Baseline SHBG was lower in women with a detectable rise in DHEAS, but not statistically significantly so (p=0.06). Our findings of a late menopause transition-associated rise in DHEAS in most women underscore the importance of longitudinal observational data, as cross-sectional studies have led to a widely held assumption that DHEAS declines inexorably in adulthood. Elucidation of how this contribution to the sex steroid milieu affects the health of middle-aged women is warranted.
[WG#398A]

33 Fitchett G, Riley B, Shahabi L, Powell L. **A Rasch Analysis of the Daily Spiritual Experiences Scale.** Society for Spirituality, Theology and Health, June 4, 2009, Durham, NC.

Primary Question:

Summary of Findings: A common hypothesis about how religion/spirituality affects health is by improving host resistance to the negative effects of stress. Daily spiritual experiences have been thought to play a key role in this process. Having a valid and reliable measure of daily spiritual experiences is a prerequisite for testing this hypothesis. We employed the Rasch model to examine the psychometric properties of the Daily Spiritual Experiences Scale (DSES). The Rasch model estimates the probability of item endorsement based on person ability and item difficulty. Data were taken from 420 white and African-American midlife women participants in the Chicago site of SWAN. We found the DSES had reasonably good person and item reliability, but there were problems with the response scale, with multi-dimensionality, item misfit, and assessment of the continuum of the construct. Developing additional items that measure a continuum of daily spiritual experiences will improve the scale.

SWAN has grant support from the National Institutes of Health, DHHS, through the National Institute on Aging, the National Institute of Nursing Research and the NIH Office of Research on Women's Health (Grants NR004061; AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, AG012495). This research was also supported by AG020145 (G Fitchett).
[WG#353A]

34 Sternfeld B, Quesenberry CP, Jiang S. **Menopause, Physical Activity and Health: Findings from SWAN (Study of Women's Health Across the Nation).** American College of Sports Medicine, Seattle, WA, May 27, 2009.
Primary Question:
Summary of Findings: Extensive scientific evidence exists supporting the numerous health benefits of regular physical activity (Physical Activity Guildelines Advisory Committee). These benefits include reduced risks of premature mortality, coronoary heart disease, hypertension, diabetes, obesity, osteoporosis, and colon and breast cancer, and improved mental health and overall quality of life. In addition, evidence suggests that age-related declines in physiological capacity (e.g. aerobic capacity, muscular strength) are attenuated by physical activity. However, whether or not physical activity modifies the adverse effects of the menopausal transition on outcomes, such as onset of vasomotor symptoms, increases in central adiposity, and increased risk of depression, is not well established.

SWAN, a multi-site, multi-ethnic, observational study of the natural history of the menopause, offers a unique opportunity to examine the relation of physical activity to a number of different outcomes relevant to women as they transition from pre- to post-menopause. The primary focus of this presentation will be on a comparison of active women with inactive women with regard to changes in weight and waist circumference over time, with time defined as years from the final menstrual period (FMP). Physical activity will be examined both as an effect modifier of the impact of time from the final menstrual period (FMP) on body size as well a confounder of that relation. The differences between active and inactive women in terms of other outcomes, such as vasomotor symptoms and depression, will also be discussed. [WG#497A]

35 Knight J, Powell L, Janssen I, Avery E. **Cortisol and Depression in a Population-Based Cohort of Midlife Women.** APA's 14th Annual APIRE Research Colloquium for Junior Investigators, 5/17/09, San Francisco, CA.
Primary Question:
Summary of Findings: Objective/Hypothesis:
Other SWAN investigators have previously demonstrated a significant relationship between depression and visceral fat accumulation in women transitioning through menopause, and it is commonly believed that this relationship is mediated by cortisol. It is also commonly accepted that hypercortisolism is associated with depression, however, the literature examining the relationship between depression and cortisol demonstrates considerable inconsistency in results. The characterization of HPA axis dysfunction is complicated and likely affected by a multitude of variables, including age, sex, race, severity of psychological insult, and technique of cortisol sampling and evaluation, any of which could influence this relationship.

Method/Proposed Methods:
We first reviewed the literature on the relationship between cortisol and depression and observed considerable inconsistency in results. There are many possible reasons for the inconsistency in the literature linking cortisol to depression, and the analyses that are planned or underway include looking at the following relationships/variables:
• The relationship may not be linear such that depressed people demonstrate both hypo- and hypercortisolemic patterns.

• The association between depression and cortisol may exist only among the more severely depressed people.
• The techniques of cortisol assessment in the literature include salivary, urinary, and plasma sampling in the morning, evening, and throughout the day and this variability may influence results; we therefore will examine our salivary samples as individual time points as well as the diurnal slope.
• Finally, extraneous factors such as physical activity, smoking, age, income, education, caffeine, recent food intake, race, menopausal status, hormone replacement therapy, BMI, and alcohol affect cortisol levels and failure to account for these variables could affect the assocation.

Discussion/Significance:
We aim to study the relationship between depression and salivary cortisol assessments in midlife women. This is a significant undertaking for several reasons. First, this study has the potential to clarify the physiologic mechanisms relating psychological functioning to cortisol response. This study is of clinical importance since perimenopausal women, particularly those in the late stage of the menopausal transition, are vulnerable to depressed mood. With the loss of protective sex hormones during this time period, depressed mood may have particularly adverse physiological effects. The delineation of an at-risk hypercortisolemic depressive subtype would be valuable clinically in helping target those at particular risk for somatic effects of depressive illness. Our findings may help guide future efforts to assess cortisol in large-scale epidemiologic cohorts, as this cohort is larger and more representative of a natural environment than many previous studies examining effects of mood on cortisol. [WG#489A]

36 Conroy SM, Butler LM, Gold EB, Crandall CJ, Greendale GA, Oestreicher N, Quesenberry CP, Habel LA. **Cigarette smoking and mammographic density: The Study of Women's Health Across the Nation (SWAN).** American Association for Cancer Research.
Primary Question:
Summary of Findings: The opposing carcinogenic and antiestrogenic properties of tobacco smoke may explain the inconsistent associations between smoking and breast cancer. Mammographic density, a strong risk factor for breast cancer, appears to be lower among current smokers, compared to never smokers. However, few studies have evaluated whether active smoking influences mammographic density after controlling for secondhand smoke (SHS) exposure. We used multivariable linear regression to assess the association between active smoking and SHS exposure, and mammographic density among 799 pre- and early perimenopausal women in the Study of Women¡¯s Health Across the Nation (SWAN). SHS exposure was defined as at least one hour of exposure in the past seven days at home, work, or other setting. Smoking status was defined as follows: (1) never smokers with and (2) without SHS; (3) former smokers with and (4) without SHS; and (5) current smokers. We observed a trend of lower mean percent density (dense tissue area/breast area) across increasing levels of smoke exposure, from 48.1% among never smokers without SHS to 38.4% among current smokers ($p<0.001$). Smoking status remained inversely associated with percent density after adjusting for age, race/ethnicity, study site, body mass index, and parity (beta= -6.49, SE=2.3, $p=0.01$ for current smoking versus never smoking without SHS). SHS exposure was not associated with percent density among never or former smokers. Among ever active smokers, statistically significant inverse associations were observed for starting to smoke before age 18 (beta= -5.3, SE=2.4, $p=0.03$) and smoking 20 or more

cigarettes per day (beta= -8.17, SE=3.0, p=0.02). The inverse association with smoking status and percent density was confined to parous women, or those who had at least one full-term birth (beta= -7.84, SE=2.5, p<0.01 for current smoking versus never smoking without SHS). Our data support an antiestrogenic hypothesis for the relation between smoking and breast cancer in parous women. Supported by NIH/DHHS grants NR004061, AG012554, AG012539, AG012546, and NCI grant R01CA89552.
[WG#386A]

37 Matthews K, Bromberger J. **Childhood Abuse and Neglect are Associated with Body Fat Distribution in Adulthood.** American Psychosomatic Society. 03/2009, Chicago, IL.
Primary Question:
Summary of Findings: Childhood abuse and neglect are traumatic early-life stressors that may be risk factors for central adiposity. Our objective was to examine the association between childhood abuse/neglect and body fat distribution in a sample of 311 women (106 Black, 205 White) from the Pittsburgh site of the Study of Women's Health Across the Nation (SWAN). SWAN included a baseline measurement of women in midlife (mean age=45.7) and 8 follow-up visits during which waist circumference (WC) and body mass index (BMI) were measured. The Childhood Trauma Questionnaire, given at visit 8, retrospectively assessed 5 domains of abuse and neglect in childhood and adolescence: emotional, physical, and sexual abuse; emotional and physical neglect. ANCOVAs were used to determine whether a history of any abuse/neglect, or each type of abuse or neglect, was associated with WC, controlling for age. Results showed that women with a history of any abuse/neglect had significantly higher WC at visit 8 than women with no abuse history (M=90.8, SE=1.2; M=96.1, SE=1.5; F(1, 308)=7.7, p=.01). Of the specific types of abuse, only physical abuse was significantly related to WC at visit 8 (M=91.7, SE=1.0; M=97.9, SE=2.3; F(1,308)=6.2, p=.01)]. A history of any abuse/neglect, or specific types of abuse or neglect, were not associated with increased WC from baseline to visit 8 (ps>.05) in the full sample. However, among women with a BMI<30, a history of any abuse/neglect, emotional abuse, physical abuse, sexual abuse, or physical neglect predicted increased WC over time. For all analyses, adjustment for BMI reduced the relationship between abuse and WC to non-significant because of a high correlation between WC and BMI (r=.91, p<.001). Additional mediation analyses showed that Trait Anger scores mediated some relationships between abuse/neglect and WC. This study suggests that traumatic early-life stressors are associated with adulthood body fat distribution, especially among normal-weight and overweight women. Supported by NIH/DHHS AG012546 and MHO59689. The content of this abstract is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NIMH, or the NIH.
[WG#458A]

38 Venkitachalam L, Wildman RW, Mackey RH, Edmundowicz D, Johnston J, Sutton-Tyrrell K. **Segment-specific Variation in the relationship between Ovarian Aging and Aortic Diameter In The Study Of Women's Health Across The Nation (SWAN) Heart Study.** Conference on Cardiovascular Disease Epidemiology and Prevention, Palm Harbor, FL, March 12-14, 2009
Primary Question:
Summary of Findings: Acknowledgment: Dr. Venkitachalam was supported by the American Heart Association Predoctoral fellowship (award number: 0615369U) from the Pennsylvania-Delaware affiliate. The Study of Women's Health Across the Nation (SWAN) has grant support from the National Institutes of Health, DHHS, through the National Institute

on Aging, the National Institute of Nursing Research and the NIH Office of Research on Women's Health; the SWAN Heart Study is supported by the National Heart, Lung, and Blood Institute (grant nos. NR004061; AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, and AG012495; as well as HL065581 and HL065591). The Chicago site of the SWAN Heart Study is also supported by the Charles J. and Margaret Roberts Trust.

Background: Ovarian aging is known to influence cardiovascular risk in women. The specific impact on arterial structure, however, remains unknown. We hypothesized that indicators of ovarian aging (menopausal status and sex hormones) will exhibit segment-specific relationship with aortic diameter in 345 Caucasian and 199 African-American women (mean age: 50 years), enrolled in the Pittsburgh and Chicago sites of SWAN, an ongoing longitudinal study of the menopausal transition. Methods: Aortic diameter was recorded at five segments - aortic root (AR), ascending (AA), descending (DA), thoracic (TA) and abdominal aorta (AbA) - using a novel, reliable electron beam tomography protocol. Sex hormones evaluated include estradiol, testosterone, and androgen excess (free androgen index/log estrogen). Results: In the overall cohort, 42% of women were in late peri or post menopause and possessed larger aortic diameters compared to those in pre/early peri menopause. Age and weight adjusted models showed interaction of menopausal status with arterial segment (Figure). A10-unit increase in estrogen levels was associated with smaller diameters in all segments (parameter estimates in millimeters:- AR: -0.01, AA: -0.003, DA: -0.02, TA: -0.02, AbA: -0.004). Increase in androgen excess on the other hand was associated with larger descending and thoracic aortic diameters (P interaction with segment: 0.02). Conclusion: These novel findings reflect the complex, segment-specific impact of ovarian aging on central vasculature. Further research is needed to evaluate this interaction as a potential mechanism for accelerated atherosclerosis observed with menopausal transition.
[WG#393C]

39 Hall M, Yao Z, Krafty RT, Sowers M, Sanders MH, Matthews KA, Kravitz HM, Gold EB, Buysse DJ. **MEASURING SLEEP: HOW DO DIARIES AND WRIST ACTIGRAPHY COMPARE WITH POLYSOMNOGRAPHY?** 67th Annual Meeting of the American Psychosomatic Society. March 4-7, 2009, Chicago, IL.

Primary Question:

Summary of Findings: MEASURING SLEEP: HOW DO DIARIES AND WRIST ACTIGRAPHY COMPARE WITH POLYSOMNOGRAPHY?
Martica H. Hall, Ph.D., Psychiatry and Psychology, Zhigang Yao, B.S., Robert T. Krafty, Ph.D., Statistics, University of Pittsburgh, Pittsburgh, PA, MaryFran Sowers, Ph.D., Epidemiology, University of Michigan, Ann Arbor, MI, Mark H. Sanders, M.D., Division of Pulmonary, Karen A. Matthews, Ph.D., Psychiatry, Epidemiology and Psychology, University of Pittsburgh, Pittsburgh, PA, Howard M. Kravitz, D.O., M.P.H., Psychiatry, Rush University Medical Center, Chicago, IL, Ellen B. Gold, Ph.D., Public Health Sciences, University of California, Davis, Davis, CA, Daniel J. Buysse, M.D., Psychiatry, University of Pittsburgh, Pittsburgh, PA

Sleep plays a critical role in health and functioning. Polysomnography (PSG), which involves recording multiple physiologic signals during sleep, is often considered to be the gold standard method for assessing sleep. Limitations to its use include access to expertise and equipment, cost and participant burden. It is, thus, important to understand how alternative methods for quantifying sleep compare to PSG. We used within-person multivariate repeated

linear models to compare important indices of sleep measured by PSG to measures derived from self-report daily diaries and wrist actigraphy, which estimates sleep and wakefulness based on motor activity. Participants were 302 mid-life women enrolled in the multi-site Study of Women across the Nation Sleep Study. All data, including PSG, were collected in participants' homes over 3 consecutive nights. Sleep outcomes were sleep duration (minutes), sleep latency (minutes to sleep onset), minutes of wakefulness after sleep onset (WASO) and sleep efficiency (time spent asleep/time spent in bed x 100). The latter 3 variables were log transformed prior to analyses. Model covariates were race, hot flashes/night sweats, body mass index (BMI), symptoms of depression and use of medications that affect sleep. Significant differences were observed between PSG and diary-assessed measures of sleep duration (Beta = 12.62, p<.01), latency (Beta = -0.38 p<.001), WASO (Beta = -3.17, p<.001) and efficiency (Beta = 0.79, p<.001). In contrast, the only actigraphy-assessed measures shown to differ significantly from PSG were sleep latency (Beta = -1.07, p<.001) and WASO (Beta = -0.63, p<.001). Compared to PSG values, diary reports underestimated the amount of time spent awake at night by over 25 minutes and overestimated sleep efficiency by approximately 7% in reference group participants (white, no hot flashes/night sweats). Actigraphy-based estimates of sleep duration and efficiency, each of which has been widely-linked to health and functioning, did not differ significantly from PSG. Supported by NIH/DHHS AG012505, AG012546, AG012554, NR04061, AG019360, AG019361, AG019362, AG019363.
[WG#420A]

40 Matthews K. **Midlife Aging: Lessons from Study of Women's Health across the Nation.** American Psychosomatic Association 2009 Scientific Session. March 5-7 Chicago ILL.
Primary Question:
Summary of Findings: No abstract - Invited presentation
[WG#486A]

41 Sutton-Tyrrell K. **Menopause, Risk Factors and Subclinical Atherosclerosis: Insight from SWAN.** American Heart Association 2008 Scientific Session November 9-11, 2008.
Primary Question:
Summary of Findings: No abstract - Invited presentation
[WG#468A]

42 Reeves K, Stone R, Modugno F, Ness R, Vogel V, Weissfeld J, Habel L, Sternfeld B, Cauley J. **Longitudinal influence of anthropometry on mammographic breast density.** Delta Omega Poster Session American Public Health Association Annual Meeting San Diego, CA0 10/27/08
Primary Question:
Summary of Findings: Title: Longitudinal Influence of Anthropometry on Mammographic Breast Density

Authors: Katherine W. Reeves, MPH,1 Roslyn A. Stone, PhD,2 Francesmary Modugno, PhD, MPH,1 Roberta B. Ness, MD, MPH,1 Victor G. Vogel, MD, MHS,3 Joel L. Weissfeld, MD, MPH,1,4 Laurel Habel, PhD,5 Barbara Sternfeld, PhD,5 Jane A. Cauley, DrPH, MPH1

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Objectives/Research Questions: In cross-sectional studies BMI is negatively associated with percent breast density, a strong risk factor for breast cancer. We sought to evaluate longitudinal associations between changes in BMI and mammographic breast density.

Methods: We studied a prospective cohort of 834 women enrolled in an ancillary study to the Study of Women¡¯s Health Across the Nation (SWAN). Height and weight were measured at annual clinic visits. Routine screening mammograms were collected and read for breast density using manual planimetry. Longitudinal associations between changes in BMI and changes in dense breast area and percent density were evaluated with random effects regression models.

Results: Mean follow-up was 4.8 years (SD 1.8), and the mean number of observations per participant was 5.6 (range 1-8). Mean annual weight change was +0.22 kg/year. In fully adjusted models, changes in BMI and weight were not associated with changes in dense breast area (¦Â=-0.0105, p=0.34 and ¦Â=-0.0055, p=0.20, respectively), but were strongly negatively associated with changes in percent density (¦Â=-1.18, p<0.001 and ¦Â=-0.44, p<0.001, respectively).

Conclusions: This study demonstrates that longitudinal changes in BMI and weight are not associated with the dense area, yet are negatively associated with percent density. Effects of changes in anthropometry on percent breast density may reflect effects on non-dense tissue, rather than on the dense tissue where cancers arise.

Implications for Public Health: These results improve our understanding of how increased BMI acts to promote breast cancer, and may lead to opportunities for disease prevention and early detection in the future.
[WG#381C]

43 Santoro N. **Differences in menopause symptoms across different ethnic groups.** NAMS Annual Meeting, 09/24/08-09/27/08 Orlando FLA.

Primary Question:

Summary of Findings: The menopausal experience is known to differ across cultures worldwide. These differences can be attributed to the overall context in which menopause occurs. It is less clear whether women of different ethnic backgrounds who exist under a similar [apos]dominant[apos] culture experience menopause differently. Data emerging from SWAN, the Study of Women[apos]s Health Across the Nation, suggest that some of the differences in menopause experience are associated with culture and others are explained by lifestyle or behavioral characteristics associated with that culture within the dominant ethnic group. For example, the increase in self reported hot flashes among African-American women is largely explained by increased adiposity in this group of women. On the other hand, there are in stances in which interaction with the dominant culture may exert deleterious effects on the menopause experience, an issue that seems to be the case for Hispanic women. While acculturation appears to be beneficial for many ethnic groups because it increases access to

health care resources and improves educational attainment, Hispanic women in SWAN and in other studies appear to derive little benefit from acculturation and sometimes even demonstrable adversity. The effects of acculturation may be related to country of origin among Hispanic women. Puerto Rican women appear to have increased vulnerability to adverse effects of acculturation. They also appear to experience more menopausal symptoms such as vaginal dryness, worse sleep and increased depressive symptoms, when compared to other Hispanic subgroups in SWAN. In contrast to the negative effects of acculturation seen in some Hispanic populations, acculturation among Japanese women in SWAN is associated with low overall levels of most menopausal symptoms. A similar reduction in symptoms is seen in Chinese women compared to Caucasians, African-Americans and Hispanics in SWAN. The extent to which contact with the dominant culture, a consequence of acculturation, increases exposure to experiences of discrimination and mistreatment needs to be taken into account when evaluating symptom data on immigrant ethnic groups. A model is proposed to address these complex issues. (supported by AG12535).
[WG#460A]

44 Whipple MO, Everson-Rose SA, Lewis TT, Powell LH, Matthews KA, Sutton-Tyrrell K. **Hopelessness, depressive symptoms and carotid atherosclerosis in women: The Study of Women's Health Across the Nation (SWAN) Heart Study.** University of Minnesota Women's Health Conference. Minneapolis, MN, September 2008.

Primary Question:

Summary of Findings: Hopelessness, depression and carotid atherosclerosis in women at mid-life: The Study of Women's Health Across the Nation (SWAN) Heart Study

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Background

Depression and hopelessness are associated with increased cardiovascular disease (CVD) and mortality risk, and several studies have suggested that the effects of hopelessness may be stronger than the effects of depression. Few studies have compared the effects of these two constructs early in the atherogenic process, especially in women and minorities.

Research Design and Methods

We examined the association between self-reported depressive symptoms and hopelessness and carotid artery intimal-medial thickening (IMT) in 576 white and African American women (mean (SD) age, 50.3 (2.8) years) from two of the 7 sites of the Study of Women's Health Across the Nation (SWAN), a prospective study of the menopausal transition, who participated in an ancillary study of subclinical CVD (SWAN Heart Study). The 20-item Center for Epidemiologic Studies Depression Scale (CES-D) and 2-item Kuopio Ischemic Heart Disease Study Hopelessness Scale were used to measure depressive symptoms and feelings of hopelessness, respectively. Non-invasive B-mode ultrasonography was used to assess mean and maximal IMT of the left and right carotid arteries.

Results

Means (SD) were 0.67 (0.10) mm for average IMT and 0.87 (0.13) for maximum IMT. In models adjusted for age, race, site, body mass index (BMI), resting systolic blood pressure

(SBP), and smoking status, CES-D score was weakly related to mean IMT (P=.062) whereas each 1-point higher CES-D score related to a significant 0.001-mm greater level of maximum IMT (P=.039). Each 1-point higher hopelessness score predicted a significant 0.006-mm greater level of mean IMT (P=.011) and a 0.008-mm greater level of maximum IMT (P=.022). With hopelessness and CES-D score modeled simultaneously, the effect of hopelessness remained significant for both mean IMT (P=.021) and maximum IMT (P=.041), whereas CES-D score was no longer significant (P>0.10). Age, race, site, BMI, and SBP were significant covariates in the model whereas smoking was nonsignificant.

Conclusions

Hopelessness and depression are associated with greater IMT in women at mid-life, independent of age, race, BMI, SBP, and smoking status, but our results indicate hopelessness likely is more atherogenic than depression. Additional research is needed to understand mechanisms that may mediate the effect of hopelessness on subclinical atherosclerosis.

Acknowledgments: Supported by NIA (U01 AG012505, U01 AG012546), NHLBI (R01 HL065581, R01 HL065591), the NIH Office of Research on Women's Health and the Program for Health Disparities Research at the University of Minnesota Medical School.
[WG#395B]

45 Thurston R, Matthews K, Sowers M, Bromberger J, Gold E, Sternfeld B, Crandall C, Joffe H, Waetjen LE. **Gains in body fat and onset of hot flashes over time: A longitudinal analysis of the Study of Women's Health Across the Nation.** North American Menopause Society. 09/2008 Orlando, Fl. Menopause 2008;15(1):1225.

Primary Question:

Summary of Findings: Objective. Recent studies show that women with greater body weight and fat have increased risk of menopausal hot flashes. These findings challenge traditional thinking that body fat is associated with fewer hot flashes due to estrone production in adipose tissue, instead supporting thermoregulatory models emphasizing insulating properties of fat. However, because studies have been cross-sectional, the directionality or causal nature of these relations is uncertain. The present study¡¯s aim was to examine whether gains in body fat were associated with increased reporting of hot flashes over time.

Design. 1801 Study of Women¡¯s Health Across the Nation participants ages 42-52 years at entry, who had their uterus and ¡Ý1 ovary at annual visits 6-9, and underwent bioelectrical impedence analysis comprised the study sample. At visits 6-9 they answered questions about hot flashes, provided a blood sample for measurement of hormone concentrations, and had bioelectrical impedance measured for body fat. Associations between change in percent body fat and hot flashes (any/none) were examined in repeated measures logistic regression models (generalized estimating equations). Visits with reported hormone therapy use were excluded.

Results. Gains in percentage of body fat were associated with significantly increased odds of hot flash reporting (per each additional % body fat gain: OR=1.04, 95%CI 1.01-1.08, p=0.01), controlling for age, site, race, menopausal status, education, parity, smoking, and anxious symptoms, current % body fat, and hot flashes at the previous visit. Associations persisted when additionally controlled for estradiol, the free estradiol index, or follicular stimulating hormone concentrations.

Conclusions. Gains in body fat were associated with increased odds of reporting of hot flashes over time. Gains in body fat, which commonly occur during the menopausal transition, may contribute to the onset and persistence of hot flashes over time.

SWAN has grant support from the NIH, DHHS, through NIA, NINR and the NIH ORWH (NR004061, AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, AG012495)
[WG#444A]

46 Venkitachalam L, Mackey RH, Wildman RW, Edmundowicz D, Johnston J, Sutton-Tyrrell K. **Segment-specific Association Of Race And Cardiovascular Risk Factors With Aortic Diameter In The Study Of Women's Health Across The Nation (SWAN) Heart Study.** 48th Cardiovascular Disease Epidemiology and Prevention March 13-15, 2008 Colorado Springs, Colorado
Primary Question:
Summary of Findings: Vascular health and its interaction with cardiovascular (CV) risk factors have been extensively studied but with emphasis on arterial function. Methods: We examined the association of central artery structure with CV risk factors in a bi-racial cohort of 544 women (mean age: 50 years, 37% African-Americans, mean BMI of 29 kg/sq.m) from the Pittsburgh and Chicago sites of SWAN, an ongoing multi-ethnic, multi-site longitudinal study of the menopausal transition. Aortic diameter was measured at five segments – aortic root (AR), ascending (AA), descending (DA), thoracic (TA) and abdominal aorta (AbA) – using previously recorded electron beam tomography scans. Parameter estimates were obtained using regression analysis that accounted for within-person correlation. Results: African-american women possessed larger diameters in every segment, albeit with varying significance, compared to their Caucasian counterparts (age, weight, site and education-adjusted estimates (SE) - AR: 0.18 (0.34), AA: 0.46 (0.32), DA: 0.81 (0.19), TA: 0.54 (0.18), AbA: 0.01 (0.20)). Significant interaction with arterial segment was also seen with the following risk factors: systolic (SBP) and diastolic blood pressures, glucose, insulin, visceral adipose tissue, lipoprotein A1 and Factor VII (Table). Exploratory stratified analysis by race revealed differences in segment-specific correlates of aortic diameter that needs to be further understood. Conclusion: Cardiovascular risk factors exhibit segment-specific association with central artery (aorta) diameter. The effect of related treatment strategies on central vasculature, therefore, needs to be further examined.
Table: Segment-specific associations of race and cardiovascular risk factors with aortic diameter.
[WG#393A]

47 Dugan SA, Everson-Rose SA, Karavolos K, Sternfeld B, Wesley D, Basu S, Powell L. **Impact of Physical Activity on Physical Function and Pain over Three Years in Midlife Women: 1315: Board #5.** American College of Sports Medicine Annual Meeting. Medicine & Science in Sports & Exercise. 38(5) Supplement:S171.
Primary Question:
Summary of Findings: PURPOSE:
To determine whether self-reported physical activity at baseline is associated with physical functioning and musculoskeletal pain over three subsequent years in a multi-ethnic population of community-dwelling middle aged women after considering sociodemographics, menstrual

status, smoking, depression score, body size and chronic medical conditions.
METHODS:
Design: Longitudinal study.
Participants: Participants were over 2,200 women from the Study of Women's Health Across the Nation (SWAN).
Measurements: Baseline physical activity level (including active living and sports indices) was the independent variable. The SF-36 Role-Physical Index and the SF-36 Bodily Pain Index were the dependent variables measured from FU 01 to 03.
Data Analysis:
Our main approach to analysis was logistic regression for the binary outcomes of the SF-36 Role-Physical (modeled as the probability of a woman having High Role-Physical) and Bodily Pain (modeled as the probability of a woman having Low Bodily Pain) for each of the 3 follow-up years. The main predictor, baseline physical activity, was a continuous variable consisting of the sum of the sports/exercise and active living domains. Due to the longitudinal nature of the outcomes (each woman could provide up to 3 responses) we used general estimating equations (GEE).
Separate analyses were conducted for each outcome. Three models were fitted using time dependent outcomes and covariates except site, ethnicity and education which were time independent variables measured at baseline only. In model 1, we adjusted for site and age. In model 2, we added ethnicity, education, and self-reported menopausal status. In model 3, we added BMI, CESD, smoking status and chronic health conditions.

RESULTS:
Baseline physical activity was significantly correlated with High Physical-Function (OR=1.07: 95% confidence interval (CI)=1.02-1.28) and Low Bodily Pain (OR=1.10; CI=1.04-1.17) at follow-up years 01 to 03 independent of age, race, menopausal status, educational level, BMI, CESD, smoking or chronic medical conditions.

Conclusions: This study demonstrates a statistically significant association between baseline physical activity and self-reported pain and physical function over the next three years regardless of menopausal status, sociodemographics, and medical conditions. Motivating women to increase their physical activity during their middle years can positively modify age-related decline in function and increase in pain.
Acknowledgments: Funded by the NIA (U01 AG012505, U01 AG012546) and NHLBI (R01 HL065581, R01 HL065591) and the NIH Office of Research on Women's Health.
[WG#264A]

48 Everson-Rose SA, Karavolos K, Lewis TT, Wesley DE, Powell LH. **Depressive symptoms and intra-abdominal fat in Caucasian and African-American women at mid-life.** American Psychosomatic Society. Psychosomatic Medicine. 2006;68:A-27.
Primary Question:
Summary of Findings: DEPRESSIVE SYMPTOMS AND INTRA-ABDOMINAL FAT IN CAUASIAN AND AFRICAN-AMERICAN WOMEN AT MID-LIFE

Susan A. Everson-Rose, Kelly Karavolos, Tené T. Lewis, Deidre E. Wesley, Lynda H. Powell, Preventive Medicine, Rush University Medical Center, Chicago, IL

Depression has been associated with excess risk of cardiovascular disease (CVD) in women and men, but the mechanisms underlying this association are not fully understood. One

potential pathway is via central adiposity. Visceral or intra-abdominal fat (IAF) is more metabolically active and confers greater cardiovascular risk than subcutaneous fat. Several studies have documented an association between depression and central adiposity but few have examined abdominal fat distribution in relation to depressive symptoms. We investigated the association between depressive symptoms, assessed by the Center for Epidemiological Studies Depression Scale (CES-D), and IAF and subcutaneous fat, assessed by CT, in a sample of 316 middle-aged women (66.8% Caucasian, 33.2% African-American; mean age=50.4 years) participating in the Chicago site of the Study of Women's Health Across the Nation (SWAN). After adjusting for age, race, menopausal status, and total fat mass (assessed by DEXA), each 1-point higher score on the CES-D was associated with 0.76 cm3 greater IAF ($p<0.018$). With CES-D scores dichotomized we found that depressed women (CES-D score=16 or greater) had 18.4% greater IAF than non-depressed women (CES-D<16) ($p=0.02$). Further adjustment for smoking, parity, physical inactivity and education did not alter the findings. Associations did not vary by race or menopausal status. Depressive symptoms were unrelated to subcutaneous fat ($p>0.55$). Findings support the hypothesis that depressive symptoms are associated with visceral fat, and not with subcutaneous fat, in women at mid-life. Greater deposition of intra-abdominal fat may be one pathway by which depression contributes to increased risk for cardiovascular disease.

Acknowledgments: SWAN is supported by NIH through NIA, NINR, and the Office of Research on Women's Health (Grants NR004061, AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, AG012495).This ancillary study also is supported by HL/AG67128.
[WG#339A]

49 Bromberger J, Matthews K. **The Associations Among Depression History, Life Stress, and Coronary Artery Calcification in Midlife Women.** American Psychosomatic Society Meeting. March 2006. Denver, CO. Psychosomatic Medicine on-line journal. 2006;68(1).
Primary Question:
Summary of Findings: The Associations Among Depression History, Life Stress, and Coronary Artery Calcification in Midlife Women.
Joyce T. Bromberger, PhD, Karen A Matthews, PhD

We evaluated the association between life stress and coronary artery calcification (CAC) and whether life stress mediates the previously reported association between recurrent major depression (RMD) and CAC. 210 women, aged 47-57, from the Pittsburgh site of the Study of Women's Health Across the Nation (SWAN) participated in a study of electron beam tomography (EBT) measures of CAC. Women reported no history of heart disease, diabetes, and were not taking hormones. They reported on demographic, psychosocial, and biological factors and participated in the Structured Clinical Interview for the Diagnosis of DSM-IV Axis I Disorders (SCID) at baseline and annually. History of depression was dichotomized as RMD vs no history or single depression episode. CAC score was dichotomized as <10 or > 10. Stress was measured as a stressful life event in the last year or a stressful ongoing problem for more than one year. To determine the effect of each stressor on the association between depression and CAC, each was added to separate multiple logistic regression analyses. 99 women reported a stressful life event and 38 reported a stressful ongoing problem. Both types of stress were associated with CAC > 10, $p=.04$ for a life event and $p=.0003$ for an ongoing problem and RMD ($p=.004$; $p=.0003$, respectively). In the analysis without stress, compared to women without RMD, those with RMD had a 2.71 odds of having CAC > 10. In the analysis

with a stressful life event, the latter was not significant, but RMD remained significantly associated with CAC > 10 (odds ratio (OR)=2.57; 95%CI=.99, 6.69, p=.05). The inclusion of a stressful ongoing problem reduced the OR for RMD to nonsignificance, p = .13, whereas the ongoing problem was marginally significant (OR=2.55; 95%CI=.89, 7.30, p=.08). These results indicate that stressful ongoing problems are associated with elevated CAC and attenuate the association between RMD and CAC. Chronic problems may be one pathway connecting depression history with CAC.
[WG#344A]

50 Janssen I, Powell LH, Lewis T, Dugan SA, Chen Z. **Reproductive Hormones Are Related to Intra-abdominal Fat in Women in Mid-Life: P184.** 46th Annual Conference on Cardiovascular Disease in Epidemiology and Prevention. Circulation. 2006;113(8):e348.
Primary Question:
Summary of Findings: Background. Intra-abdominal fat (IAF) increases from pre- to post-menopause independently of age, but the reasons for this increase are unclear. This cross-sectional study examined correlates of several reproductive hormones and intra-abdominal fat (IAF) in Caucasian and African American women at various stages of the menopausal transition in the Diabetes Risk Study, an ancillary study of the Study of Women's Health Across the Nation (SWAN).
Methods. From the 410 women in the total cohort, 151 AA and 194 CAU participants were selected if they: (1) were either pre, peri- or post-menopausal, (2) never took hormone therapy, (3) did not undergo a hysterectomy or double oophorectomy. IAF was measured with a CT scan, and total body fat was measured with a DEXA scan. Reproductive hormones (testosterone, estradiol, and SHBG) were measured from a blood draw at day 2-5 of the menstrual cycle.
Results. Women of both ethnicities were comparable in age (mean±SD=50.5±3.8yr), SHBG (55.0±31.4nM), free testosterone (3.81±3.38ng/dL/nM) and the ratio of log(free testosterone) and log(free estradiol) (0.32±0.27). Compared with Caucasian women, African American women had larger total fat mass (46.2±7.8 vs 41.2±8.7%, p<.0001). IAF was lower in AA than in CAU women (84.1±48.2 vs. 102.0 ±42.2kg, p=0.0005) after adjusting for age and percent total fat mass. IAF increased from pre- to post-menopause (p=0.022), but no ethnic differences were found between the trends. After adjusting for age and percent total fat mass, IAF was correlated with SHBG (r=-0.290, p<0.0001), with free testosterone (r=0.285, p<0.0001), and with the ratio of free testosterone to free estradiol (r=0.303, p<0.0001). These associations were similar after adjusting for education, alcohol consumption, smoking, physical activity, number of pregnancies, and depression. They did not differ in AA and CAU women.
Conclusions. The increasing androgenicity of the hormonal milieu in women at various stages of the menopausal transition is related to increases in IAF. If validated in longitudinal analyses, this suggests that testosterone is a risk factor for an important component of the metabolic syndrome in women.
[WG#336A]

51 Janssen I, Powell LH, Crawford S. **Menopause Related Patterns of Change in Androgen Excess and Cardiovascular Risk Factors.** AHA Council on Epidemiology meeting. Circulation. 2005;111(14):e220.
Primary Question:
Summary of Findings: Background. The balance of androgens relative to estrogen may be

a novel, menopause-related risk factor for sub-clinical cardiovascular disease. However, there are several ways to calculate this balance. The purpose of this paper is to provide validation for one or more of these measures of androgen/estrogen balance by comparing their patterns across the peri-menopause with patterns of cardiovascular risk factors over the same time period.
Methods. This was a longitudinal 6-year study of 779 participants in the Study of Women¡¯s Health Across the Nation (SWAN) , an investigation of the natural history of the menopause transition. Participants were selected from the 3302 women in the total cohort if they: (1) reached menopause and (2) never took hormone therapy. Annual measures of reproductive hormones (testosterone, estradiol and SHBG) and CV risk factors (elevated blood pressure, metabolic syndrome, and BMI) were graphed over a ten year period centered at the final menstrual period (FMP), each woman contributing up toi 6 six of data in different parts of the ten year time frame. Three measures of androgen excess were investigated: T/E2, FTI/E2, and FTI/FEI where FTI, the free testosterone index, is testosterone adjusted for SHBG and FEI, the free estrogen index, is estradiol adjusted for SHBG. Associations were examined visually from the graphs and statistically using generalized estimation equations to account for within-woman correlation of repeated assessments.
Results. Of the 3 calculations of androgen excess, FTI/E2 showed the clearest link to menopausal status, with a flat line in the pre- and early peri-menopause and an increase in the late peri-menopause and post-menopause. The other two calculations showed more curvature. The likelihood of higher than normal BP (SBP¡Ý120mmHg or DBP¡Ý80mmHg) increased significantly with FTI/E2 (p=0.0230), as did the likelihood of having metabolic syndrome (p=0.0007), or being overweight (p=0.0047). Associations were similar for the FTI/FEI models. The weakest associations were observed using measures of androgen excess without adjustment for SHBG.
Conclusions. This criterion validity study suggested that a link between androgen excess and cardiovascular risk is strongest when androgen excess is measured as FTI/E2. Further exploration of this link is needed.

[WG#289A]

52 Kathiresan S, Chen Z, Janssen I, Wildman RP, Edmundowicz D, Matthews KA, Hollenburg SM, Sutton-Tyrrell K, Powell LH. **Metabolic Syndrome, Prothrombotic Markers, and Inflammation are Each Independently Associated with Coronary Artery Calcification in Peri-Menopausal Women: The Swan Heart Study.** American Heart Association/Cardiovascular Disease Epidemiology. Circulation. 2005;111(14):e206.
Primary Question:
Summary of Findings: Background: The observed association between metabolic syndrome (MS) and coronary artery calcification (CAC) may be mediated through abnormalities that accompany core criteria including a prothrombotic state, proinflammatory state, and insulin resistance. The relative association of each of these factors with CAC was evaluated in a study of 559 perimenopausal women (mean age 50 years, 37% African-American).
Methods: We assessed CAC by electron beam computed tomography. MS core criteria included waist circumference, high density lipoprotein cholesterol, triglyceride, high blood pressure, and fasting glucose and the MS was defined by the presence of 3 of 5 of these core criteria. We measured the following additional markers: prothrombotic (tissue plasminogen activator[tPA], plasminogen activator inhibitor-1[PAI-1], factor VII[FVII]); proinflammatory (C-reactive protein[CRP], fibrinogen); and insulin resistance (homeostasis model assessment

index[HOMA]). Non-MS covariates included age, smoking, physical activity, education, race, and alcohol use. We used multivariable-adjusted logistic regression models to test the associations between MS components and CAC (presence or absence).
Results: CAC was present in 48% of the women. MS was present in 21% of women. MS was associated (logistic regression odds ratio (OR) and 95% confidence interval) with CAC (OR, 6.2 [3.4, 11.2]) after adjusting for non-MS risk factors. In a multivariable model incorporating MS, non-MS risk factors, prothrombotic markers, proinflammatory markers, and insulin resistance, the following were significantly related to CAC: MS (OR, 3.3 [1.6, 7.0], alcohol use (OR, 0.57 [0.35, 0.93], tPA (OR, 1.11 [1.02, 1.20]), FVII (OR, 1.01 [1.001, 1.016]), and CRP (OR, 1.12 [1.04, 1.21]).
Conclusions: In our cross-sectional study of middle-aged women, prothromobotic and proinflammatory markers were associated with CAC above and beyond the clinical definition of MS. These results are consistent with the hypothesis that distinct pathways related to the MS each contribute to the development of CAC.

[WG#291A]

53 Kathiresan S, Chen Z, Janssen I, Wildman RP, Matthews KA, Edmundowicz D, Hollenburg SM, Sutton-Tyrrell K, Powell LH. **Metabolic Syndrome is Associated with Aortic Calcification in Women at Midlife: The SWAN Heart Study.** American Heart Association/Cardiovascular Disease Epidemiology. Circulation. 2005;111(14):e206.
Primary Question:
Summary of Findings: Background: Metabolic syndrome (MS) core criteria and accompanying prothrombotic, proinflammatory, and insulin resistance components may each relate to the development of aortic calcification (AC). Data regarding the relations between MS components and AC are limited, particularly in middle-aged women.
Methods: We examined the cross-sectional relations of MS components with AC in a study of 557 middle-aged peri-menopausal women (mean age 50 years, 37% African-American). We assessed AC by electron beam computed tomography. MS was defined by presence of 3 of 5 core criteria including waist circumference, high density lipoprotein, triglyceride, high blood pressure, and fasting glucose. We measured the following additional markers: prothrombotic (tissue plasminogen activator, plasminogen activator inhibitor-1, factor VII); proinflammatory (C-reactive protein, fibrinogen); and insulin resistance (homeostasis model assessment index [HOMA]). Non-MS covariates included age, smoking, low density lipoprotein cholesterol (LDL-C), physical activity, education, race, and alcohol use. We used multivariable-adjusted logistic regression models to test the associations between MS components and AC (above or below median Agatston score =13).
Results: MS was present in 21% of women. MS was associated (logistic regression odds ratio (OR) and 95% confidence interval) with AC (OR, 7.2 [3.8, 13.8]) after adjusting for non-MS risk factors. Plasma fibrinogen was associated with AC (OR, 1.01 [1.002, 1.012]) after adjusting for MS and non-MS risk factors. HOMA was associated with AC (OR, 1.28 [1.01, 1.48]) after controlling for MS and non-MS risk factors. In a multivariable model incorporating MS, non-MS risk factors, prothrombotic markers, proinflammatory markers, and insulin resistance, the following were significantly related to AC: MS (OR, 4.6 [2.1, 10.3]), smoking (OR, 2.4 [1.2, 5.0]), LDL-C (OR, 1.01 [1.002, 1.018]), fibrinogen (OR, 1.01 [1.002, 1.012]), and HOMA (OR, 1.3 [1.06, 1.54]).
Conclusions: In our biracial sample of middle-aged women, clinically-defined MS, inflammation, and insulin resistance were each independently related to AC.

[WG#290A]

54 Everson-Rose SA, Karavolos K, Lewis TT, Powell LH, Sutton-Tyrrell K, Matthews KA. **Cynical hostility and carotid atherosclerosis in a biracial sample of mid-life women.** American Psychosomatice Society meeting. Psychosomatic Medicine. 2005;67:A-60.
Primary Question:
Summary of Findings: Abstract:Hostility has been associated with increased risk of cardiovascular (CV) and all-cause mortality and incident coronary heart disease. Emerging evidence suggests hostility also may be related to subclinical CV disease. The majority of studies have been limited to Caucasian men; thus, less is known about the impact of hostility on CV risk or subclinical disease in women or minority populations. This study examined the association between low, moderate and high scores on a 13-item measure of cynical hostility and carotid atherosclerosis, assessed by B-mode ultrasonography, in a middle-aged sample of Caucasian and African-American women (N=553) from the Chicago and Pittsburgh sites of the Study of Women's Health Across the Nation (SWAN). SWAN is an ongoing, multi-ethnic, multi-site, longitudinal study of the impact of the menopausal transition on CV risk and other health outcomes. With adjustment for age, study site, race, and education, high hostile women had higher levels of overall intimal-medial thickening (IMT) and maximal IMT compared to low hostile women (overall IMT means=0.693 and 0.671 mm, respectively, p=0.044; maximal IMT means=0.902 and 0.863 mm, respectively, p=0.014). Moderately hostile women did not differ from low hostile women. Further adjustment for body mass index and standard CV risk factors, as indexed by the Framingham Risk score, did little to diminish the observed associations. African-American women had significantly higher hostility scores and greater IMT than Caucasians but no race by hostility interactions were noted. Findings indicate that high levels of cynical hostility are related to greater subclinical atherosclerosis in women at mid-life.

Acknowledgments: Funded by the NIA (U01 AG012505, U01 AG012546) and NHLBI (R01 HL065581, R01 HL065591) and the NIH Office of Research on Women's Health.

[WG#279A]

55 Lewis T, Everson-Rose S, Karavolos K, Powell L, Matthews K. **Negative life events and weight gain in women at mid-life.** American Psychosomatice Society meeting. Psychosomatic Medicine. 2005;67:A-56.
Primary Question:
Summary of Findings: Findings from animal models suggest that various forms of "stress" may be associated with the accumulation of adipose tissue over time; however few studies have prospectively examined these effects in humans. We examined the longitudinal association between negative life events assessed at baseline and weight gain over 4 years in a middle-aged sample of 2,017 African-American and Caucasian women from 4 sites of the Study of Women's Health Across the Nation (SWAN). At baseline, negative life events were highest in African-American women (p<.0001), women with "some college" education (p=.008), and women who were obese (p=.002). Baseline weight was higher in women who were African-American (p<.0001) or reported their highest level of education as a HS degree or less (p<.0001). Negative life events were significantly associated with baseline weight (b=.34, p=.03) and increased weight gain over follow-up (b=.05, p=.003) after adjusting for age, education, parity, menopausal status, and chronic health conditions. Further

adjustments for behavioral risk factors (smoking, physical activity, total caloric intake, and percent fat intake), did not alter these associations. Although there were significant demographic differences in the occurrence of negative life events, the effects of life events on weight and weight gain did not differ by race, education, or baseline BMI category. Findings suggest that negative life events may be an important contributor to weight gain in middle-aged women, independent of their effects on behavioral risk factors such as smoking, diet and exercise. Reducing the emotional impact of life events and improving coping techniques may prevent the weight gain associated with mid-life aging.

Acknowledgements: SWAN is funded by the National Institutes on Aging and Nursing Research (U01 AG012495, U01 AG012505, U01 AG012531, U01 AG012546, U01 AG012553, U01 NR04061) and the NIH Office of Research on Women's Health.

[WG#247A]

56 Goldbacher EM, Matthews KA, Bromberger J. **DOES HISTORY OF DEPRESSION AFFECT YOUR WAISTLINE?** American Psychosomatic Society meeting (APS), March 2005. Psychosomatic Medicine. 67(1):A-27.
Primary Question:
Summary of Findings: There is substantial evidence for a role of depression in the pathogenesis of CHD and Type 2 diabetes, but little is known about potential pathways. Although central adiposity has been identified as a possible link between depression and disease, only one study has examined its relationship with depressive illness. Our objective was to examine the association between lifetime history of depression and central adiposity over time in a sample of middle-aged women. Participants consisted of 270 women (31% Black) from the Pittsburgh cohort of The Study of Women's Health Across the Nation, a study of the menopausal transition. General linear modeling repeated measures ANOVAs, controlling for age and education, were used to evaluate the association between lifetime history of depression, measured at baseline by the SCID, and central adiposity measured by waist circumference (WC) across baseline and five annual visits. Results showed significant main effects of race $F(1, 264) = 23.47$, $p < .001$ and depression $F(1, 264) = 9.37$, $p < .01$ on WC across time, and a significant WC by race interaction $F(1, 263) = 11.64$, $p < .01$. Analyses stratified by race showed an effect of depression history in Blacks only $F(1, 80) = 14.39$, $p < .001$. Similarly, analyses of WC across follow-up visits only, controlling for baseline WC, showed a main effect of depression, $F(1, 263) = 5.75$, $p < .05$ and a trend for an effect in Blacks but not Whites. Results were independent of baseline BMI. Analyses also showed an association between depression history and BMI across time, but it was not independent of baseline WC. This study is the first to demonstrate that a lifetime history of depressive illness is associated with elevated central adiposity across time in middle-aged Black women. Black women may be vulnerable to the physiological sequelae of depression over time.
SWAN was funded by NIH NIA, NIMH, and NINR.

[WG#281A]

57 Everson-Rose S, Meyer P, Pandey D, Torrens J, Kravitz H, Powell L, Bromberger J, Matthews K. **Depressive symptoms, insulin resistence and diabetes risk in multi-ethnic community sample of women.** American Psychosomatic Society (APS), annual meeting, March 2003. Psychosomatic Medicine. 2003;65:A-10.

Primary Question:
Summary of Findings:
[WG#182A]

58 Harlow S, Crawford S, Gold EB, Bromberger J, Lasley B, Luborsky J, Weiss G. **Hormones and Usual Menstrual Characteristics in Early Perimenopause.** American Journal of Epidemiology - Abstracts. 2001;153(11):S92-297.
Primary Question:
Summary of Findings:
[WG#130A]

59 Crawford S, Harlow S, Gold EB, Bromberger J, Lasley B, Luborsky J, Weiss G. **Hormones and Concurrent Menstrual Characteristics in Early Perimenopause.** American Journal of Epidemiology. 2001;153(11):S140(490).
Primary Question:
Summary of Findings:
[WG#130B]

60 Bromberger JT, Cauley JA, Matthews KA. **History of Depression and Fractures in Middle-Aged African American and Caucasian Women.** American Psychosomatic Society Meeting, Mar. 2000. Journal of Psychosomatic Medicine. 2000;62.
Primary Question:
Summary of Findings:
[WG#101A]

61 Sherman S, Goldstein RE, Crawford SL, Ory M, Guralnik JM. **Menopause and Six Chronic Conditions of Aging: The Study of Women's Health Across the Nation.** American Psychosomatic Society Annual Meeting, Mar. 2000. Psychosomatic Medicine. 2000;62.
Primary Question:
Summary of Findings:
[WG#89]

62 Gold EB. **Correlates of age at menopause in a multi-racial/ethnic sample of women.** Society for Epidemiologic Research Ann. Mtg., June 1999. American Journal of Epidemiology. 1999:149(11):S26.
Primary Question:
Summary of Findings:
[WG#85]

63 Lasley BL, Santoro N, Randolph J, Weiss G, Korenman S, Gold E, Midgley R, McConnell DS, Luborsky J, Powell L, Harlow S, McGaffigan P. **SWAN: The Daily Hormone Study.** Annual Meeting of the Endocrine Society. 1999;S33-2:41.
Primary Question:
Summary of Findings:
[WG#100]

64 Welch G, Sowers MF, Harris V, Sanchez-Pena R. **Efficacy of telephone and in-person contact methods in a large cross-sectional study.** Society for Epidemiologic Research Ann. Mtg., 1998. American Journal of Epidemiology. 1998;147(11):S82.
Primary Question:
Summary of Findings:
[WG#68]

65 Harris VM, Sowers MF, Pope SK. **Perceived Stress and Church Membership as Factors in Health Among Women During Mid-Life.** Society for Epidemiologic Research Ann. Mtg., 1998. American Journal of Epidemiology. 1998;147(11):S39.
Primary Question:
Summary of Findings:
[WG#71]

66 LaChance L, Sowers MF, Schork MA. **The Relationship between Dietary Patterns and Osteoarthritis of the Hand and Knee in Pre- and Perimenopausal Women.** American College of Rheumatology 62nd National Meeting, Nov. 1998. Arthritis & Rheumatism. 1998;41(9)Supplement:S181.
Primary Question:
Summary of Findings:
[WG#94]

67 Matthews KA, Pasternak RC, McKinlay S. **Cardiovascular Disease Risk Factors in Women at Mid-Life.** Gerontology Society of America Annual Meeting Nov. 1998. The Gerontologist. 1998;38 (Special Issue I).
Primary Question:
Summary of Findings:
[WG#75C]

68 Harlow S, Santoro N., Randolph J, Sowers MF. **Ovarian aging in a Multi-Ethnic Cohort of Midlife Women.** Gerontology Society of America Annual Meeting Nov. 1998. The Gerontologist. 1998;38 (Special Issue I).
Primary Question:
Summary of Findings:
[WG#75B]

69 Gold E, Avis N, Sternfeld B, Skurnick J. **Risk Factors and Symptoms of Menopause in a Multi-Ethnic Cohort of Women.** Gerontology Society of America Annual Meeting Nov. 1998. The Gerontologist. 1998;38 (Special Issue I).
Primary Question:
Summary of Findings:
[WG#75A]

70 Bradsher JE, Crawford SL. **Study of Women's Health Across the Nation: Overview of Study Design.** Gerontology Society of America Annual Meeting Nov. 1998. The Gerontologist. 1998; 38(Special Issue I).
Primary Question:

Summary of Findings:
[WG#75E]

71 Bradsher J. **The Study of Women's Health Across the Nation: Early Results from a Multi-Ethnic Cohort Study.** Gerontology Society of America Annual Meeting Nov. 1998. The Gerontologist. 1998;38 (Special Issue I).
Primary Question:
Summary of Findings:
[WG#75]

72 Finkelstein JS, Sowers MF, Neer R, Cauley J. **Changes in Bone Mass, Bone Turnover, and Body Composition in Mid-Life Women.** Gerontology Society of America Annual Meeting Nov. 1998. The Gerontologist. 1998;38 (Special Issue I).
Primary Question:
Summary of Findings:
[WG#75D]

73 LaChance L, Sowers MF, Schork MA. **The Association between Antioxidant Vitamin Intake from Diet and Supplement Sources and Osteoarthritis of Hand and Knee in Pre- and Perimenopausal Women.** American College of Rheumatology 62nd National Meeting, Nov. 1998. Arthritis & Rheumatism. 1998;41(9)Supplement:S181.
Primary Question:
Summary of Findings:
[WG#93]

74 Kravitz HM, Ganz PA, Sherman S, Sutton-Tyrrell K, Bromberger JT, Powell LH. **Sleep Difficulty During the Menopausal Transition.** Sleep. 1998;21(Supplement):299.
Primary Question:
Summary of Findings:
[WG#30B]

75 Fitchett G. **Faith and meaning in menopause and health: preliminary results.** Am. Psychosomatic Society Annual Mtg., March 1998. Psychosomatic Medicine. 1998;60(1).
Primary Question:
Summary of Findings:
[WG#77B]

76 Powell LH. **Mood disorders during the course of the menopausal transition: preliminary findings.** American Psychosomatic Society Annual Meeting, March 1998. Psychosomatic Medicine. 1998;60(1).
Primary Question:
Summary of Findings:
[WG#77A]

77 Matthews K, Powell L. **Correlates of Hysterectomy in a National Samples of Middle-Aged Women.** American Psychosomatic Society Annual Meeting, March 1998. Psychosomatic Medicine. 1998;60(1).

Primary Question:
Summary of Findings:
[WG#77D]

78 Ory M, Powell L. **Psychosocial and cultural aspects of the menopausal transition.** American Psychosomatic Society Annual Meeting, March 1998. Psychosomatic Medicine. 1998;60(1).
Primary Question:
Summary of Findings:
[WG#77C]

79 Santoro N. **SWAN: Reproductive hormonal characteristic of midlife women.** American Public Health Association 125th Annual Meeting, Nov. 1997. American Journal of Public Health. 1997;87.
Primary Question:
Summary of Findings:
[WG#45]

80 Bradsher JE and the SWAN Research Group **Health and Social Structural Predictors of Routine Health Care Among Women at Mid-Life.** Gerontology Society of America Annual Meeting, Nov. 1997. The Gerontologist. 1997;37(Special Issue I).
Primary Question:
Summary of Findings:
[WG#23]

81 Gold EB. **Menopausal symptoms in a multi-ethnic population.** Gerontology Society of America Annual Meeting, Nov. 1997. The Gerontologist. 1997;37(Special Issue I).
Primary Question:
Summary of Findings:
[WG#41]

82 Bradsher JE (NERI, Watertown, MA), Ory M (NIA, Bethesda, MD). **The Study of Women's Health Across the Nation: Early Results of a Multi-Site, Multi-Ethnic Study.** Gerontology Society of America Annual Meeting, Nov. 1997. The Gerontologist. 1997;37(Special Issue I).
Primary Question:
Summary of Findings:
[WG#38]

83 Cauley J. **Study of Women's Health Across the Nation (SWAN): Focus on Bone Health.** American Public Health Association 125th Annual Meeting, Nov. 1997. American Journal of Public Health. 1997;87.
Primary Question:
Summary of Findings:
[WG#43]

84 Bradsher J for the SWAN Research Group. **Overview of the Study of Women's Health Across the Nation for the SWAN Research Group.** American Public Health Association

125th Annual Meeting, Nov. 1997. American Journal of Public Health. 1997;87.
Primary Question:
Summary of Findings:
[WG#42]

85 Sternfeld B, Gold EB. **Study of Women's Health Across the Nation: Menopausal symptoms in an ethnically diverse population of mid-life women.** American Public Health Association 125th Annual Meeting, Nov. 1997. American Journal of Public Health. 1997;87.
Primary Question:
Summary of Findings:
[WG#46]

86 Powell LH, Bromberger J. **Study of Women's Health Across the Nation (SWAN): Psychosocial Aspects.** APHA 125th Annual Meeting Nov. 1997, IN. American Journal of Public Health. 1997;87.
Primary Question:
Summary of Findings:
[WG#44]

87 Harden T, Sowers MF, Matthews KA, Powell LH, Gold EB. **Recent Advances in Understanding Women's Health at Midlife.** American Psychological Association Annual Meeting, August 1997. American Psychologist. 1998;53.
Primary Question:
Summary of Findings:
[WG#47]

88 Sowers MF, Pope S, Welch G, Sternfeld B, Albrecht G. **Functional Status of Women During the Perimenopausal Transition.** American Psychological Assoc Annual Mtg., August 14, 1997. American Psychologist. 1998;53.
Primary Question:
Summary of Findings: Even at the relatively early ages of 40-55 years, approx. 20% of women self-reported limitation in physical functioning. Surgical menopause, post-menopause and the use of hormones were more frequently observed among women with "some" and "substantial" physical limitation, even after adjusting for economic status, age, body mass index, and race/ethnicity.
[WG#3/4A]

89 Janssen I, Derby CA, Dugan S, Kravitz H, Powell LH **IMPACT OF CARDIOVASCULAR HEALTH ON COGNITIVE AGING IN MIDLIFE: IS THERE A DIFFERENCE BY RACE? THE STUDY OF WOMEN'S HEALTH ACROSS THE NATION (SWAN)**
Primary Question:
Summary of Findings:
[WG#1123A]

90 Powell, LH, Dugan, SA, Derby, CA, Kravitz, HM, Janssen I **Does the impact of cardiovascular health on cognitive aging in midlife differ by race? The Study of**

Women's Health Across the Nation (SWAN)
Primary Question:
Summary of Findings:
[WG#1123B]

PAPER PROPOSAL (PUBLIC USE DATA ONLY)

1 Leis AM, Jackson EA, Baylin A,Barinas-Mitchell E, El Khoudary SR, Karvonen-Gutierrez CA **Carotid Intima Media Thickness and Comorbid Cardiometabolic Dysfunction in Women: The SWAN Study** Menopause
Primary Question: Do obesity and metabolic syndrome have unique effects on cardiovascular risk?
Summary of Findings: There are a significant proportion of metabolically healthy obese individuals within SWAN. The findings from this study suggest that there is only a minimal impact of obesity on carotid artery thickness over the effect of metabolic syndrome alone.
[WG#1034]

2 El Khoudary SR, Chen X, Wang Z, Brooks MM, Orchard T, Crawford S, Janssen I, Everson-Rose SA, McConnell D, Matthews K, **Low-density lipoprotein subclasses over the menopause transition and risk of coronary calcification and carotid atherosclerosis: The SWAN Heart & HDL Ancillary studies** Menopause
Primary Question: 1) Are LDL subclasses change over the menopause transition independent of aging?
2) Are LDL subclasses during midlife associated with the presence of coronary artery calcification and carotid intima-media thickness?
3) Will these associations vary by the timing of these measures as related to the final menstrual period (FMP)?

Summary of Findings: Women experience significant atherosclerotic increases in LDL subclasses that increases their risk of having greater cIMT levels and higher CAC prevalence. The reported associations were more profound during perimenopause stage.
[WG#1081]

3 Schiff MD, Mair CF, Barinas-Mitchell E, Brooks MM, Mendez DD, Naimi AI, Reeves A,Hedderson M, Janssen I, Fabio A **Longitudinal Profiles of Neighborhood Socioeconomic Vulnerability Influence Blood Pressure Changes Across the Female Midlife Period** Health Place 2023 Jul;82:103033. doi: 10.1016/j.healthplace.2023.103033. Epub 2023 May 2. PMID: 37141837 PMCID: PMC10407757
Primary Question: Does longitudinal exposure to neighborhood socioeconomic vulnerability throughout midlife impact blood pressure levels and their annual progression over time?
Summary of Findings: We used data from the Study of Women's Health Across the Nation to characterize longitudinal patterns of neighborhood socioeconomic vulnerability and sociodemographic change over time, and to determine their influence on blood pressure levels and their annual progression among women across ten-year follow-up. We identified four unique profiles of neighborhood socioeconomic vulnerability, and found that women living in socioeconomically vulnerable neighborhoods throughout midlife – characterized by lower

SES, greater vacant housing, higher population density, and more non-Hispanic Black and Hispanic residents – had significantly higher SBP levels at study start, and experienced the fastest rate of annual SBP growth (at 0.93 mmHg/year) across ten-year follow-up. In our racially, ethnically, and geographically-diverse cohort of 2,738 women transitioning through menopause, neighborhood socioeconomic vulnerability was significantly associated with accelerated increases in systolic blood pressure throughout midlife.
[WG#1023]

4 Lange-Maia BS, El Khoudary SR, Crandall CJ, Zhang Y, Karvonen-Gutierrez CA, Gabriel KP, Appelhans BM, Strotmeyer ES, Ylitalo KR, Karavolos K, Kravitz HM, Dugan SA, Janssen I **Pre- and Early Perimenopausal Physical Function and Risk of Cardiovascular Events: The Study of Women's Health Across the Nation**
J Aging Health Lange-Maia BS, El Khoudary SR, Crandall CJ, Zhang Y, Karvonen-Gutierrez CA, Gabriel KP, Appelhans BM, Strotmeyer ES, Ylitalo KR, Karavolos K, Kravitz HM, Dugan SA, Janssen I. Pre- and Early Peri-menopausal Physical Function and Risk of Cardiovascular Events: The Study of Women's Health Across the Nation. J Aging Health. 2023 Jun;35(5-6):383-391. doi: 10.1177/08982643221133580. Epub 2022 Oct 17. PMID: 36250945; PMCID: PMC10106523.
Primary Question: Do women with lower physical function during pre- or perimenopause have higher risk for a cardiovascular event compared to women with better physical function?
Summary of Findings: Women with lower physical function during pre- or perimenopause have higher risk of a cardiovascular event as they age. This association appears to be due to higher cardiovascular risk factors among women with lower physical function.
[WG#1019]

5 Swanson LM, Hood MM, Hall MH, Avis NE, Joffe H, Colvin A, Ruppert K, Kravitz HM, Neal-Perry G, Derby CA, Hess R, Harlow SD **Sleep timing, sleep regularity, and psychological health in early late life women: Findings from the Study of Women's Health Across the Nation (SWAN).** Sleep Health Swanson LM, Hood MM, Hall MH, Avis NE, Joffe H, Colvin A, Ruppert K, Kravitz HM, Neal-Perry G, Derby CA, Hess R, Harlow SD. Sleep timing, sleep regularity, and psychological health in early late life women: Findings from the Study of Women's Health Across the Nation (SWAN). Sleep Health. 2023 Apr;9(2):203-210. doi: 10.1016/j.sleh.2022.11.001. Epub 2022 Dec 9. PMID: 36509657. PMCID: PMC10478033
Primary Question: Are sleep timing and regularity of sleep timing associated with psychological health?
Summary of Findings: Unhealthy sleep timing was associated with depressive symptoms. Irregular sleep was associated with depressive symptoms, anxiety symptoms, and worse psychological well-being.
[WG#1063]

6 Sanders WM, Harlow SD, Ylitalo KR, Lange-Maia BS, Leis AM, McConnell DS, Karvonen-Gutierrez CA **The Association of Inflammatory Factors With Peripheral Neuropathy: The Study of Women's Health Across the Nation.** J Clin Endocrinol Metab Sanders WM, Harlow SD, Ylitalo KR, Lange-Maia BS, Leis AM, McConnell DS, Karvonen-Gutierrez CA. The Association of Inflammatory Factors With Peripheral Neuropathy: The Study of Women's Health Across the Nation. J Clin Endocrinol Metab. 2023 Mar 10;108(4):962-970. doi: 10.1210/clinem/dgac612. PMID: 36260527; PMCID: PMC10211489.
Primary Question: Are cardio-metabolic and inflammatory variables at baseline predictive

of neuropathy in SWAN women at visit 15?
Summary of Findings: We found that baseline metabolic syndrome is a significant predictor of neuropathy even after control for obesity and diabetes. Longitudinal CRP was also strongly predictive even after control for all three metabolic conditions, and mediated the relationship between both obesity and metabolic syndrome with peripheral neuropathy
[WG#1055]

7 Park S, Ding N, Harlow SD, Mukherjee B, Randolph JF Jr, Zheutlin E **Associations between Repeated Measures of Urinary Phthalate Metabolites with Hormones and Timing of Natural Menopause** Journal of the Endocrine Society 2023 Feb 3;7(4):bvad024. doi: 10.1210/jendso/bvad024. eCollection 2023 Feb 9. PMID: 36846211 PMCID: PMC9945847
Primary Question: Are exposures to phthalates associated with hormones including estradiol, testosterone, FSH, SHBG, and AMH, and timing of natural menopause in midlife women?
Summary of Findings: We found that phthalates may affect circulating levels of testosterone in midlife women, especially in postmenopausal women, supporting antiandrogenic properties of phthalates.
[WG#878MS2]

8 Jakubowski KP, Koffer RE, Matthews KA, Burnett-Bowie SM, Derby CA, Yu EW, Green R, Thurston RC **Psychosocial Impacts of the COVID-19 Pandemic on Women with Trauma Histories: Study of Women's Health Across the Nation (SWAN)** Journal of Traumatic Stress Jakubowski KP, Koffer RE, Matthews KA, Burnett-Bowie SM, Derby CA, Yu EW, Green R, Thurston RC. Psychosocial impacts of the COVID-19 pandemic on women with trauma histories: Study of Women's Health Across the Nation (SWAN). J Trauma Stress. 2023 Feb;36(1):167-179. doi: 10.1002/jts.22896. Epub 2022 Dec 4. PMID: 36463566; PMCID: PMC9877990.
Primary Question:
The current study investigated whether pre-pandemic histories of childhood abuse or intimate partner violence (reported roughly 4-12 years prior to the COVID-19 pandemic) were prospectively related to elevated depression, anxiety, interpersonal conflict, and sleep problems during the pandemic among older women.

Summary of Findings:
[WG#1035]

9 Carpenter JS, Cortés YI, Tisdale JE, Sheng Y, Jackson EA, Barinas-Mitchell E, Thurston RC **Palpitations across the menopause transition in SWAN: trajectories, characteristics, and associations with subclinical cardiovascular disease.** Menopause Carpenter JS, Cortés YI, Tisdale JE, Sheng Y, Jackson EA, Barinas-Mitchell E, Thurston RC. Palpitations across the menopause transition in SWAN: trajectories, characteristics, and associations with subclinical cardiovascular disease. Menopause. 2023 Jan 1;30(1):18-27. doi: 10.1097/GME.0000000000002082. Epub 2022 Oct 16. PMID: 36256921; PMCID: PMC9797427.

Primary Question: We explored trajectories of palpitations over time, their risk factors, and their associations with subclinical cardiovascular disease.

Summary of Findings: We identified three distinct trajectories of palpitations: high probability of palpitations in the peri- to early postmenopause diminishing in the late postmenopause (15.9% of women), moderate probability of palpitations in the peri- to early postmenopause diminishing in the late postmenopause (34.3%), and sustained low probability of palpitations (49.8%). The high probability group had more financial strain, and a more adverse reproductive and health-related profile at baseline. Palpitations trajectories were not related to atherosclerosis or arterial stiffness.
[WG#1053]

10 Wang X, Karvonen-Gutierrez CA, Gold EB, Derby C, Greendale G, Wu X, Schwartz J, Park SK **Longitudinal Associations of Air Pollution With Body Size and Composition in Midlife Women: The Study of Women's Health Across the Nation** Diabetes care 2022 Nov;45(11):2577-84. PMID: 36084038; PMCID: PMC9679268
Primary Question: Air pollution has been suggested to be associated with obesity; however, epidemiologic evidence is limited and has largely focused on body mass index (BMI). We examined longitudinal associations of air pollution exposure, including fine particulate matters (PM2.5), nitrogen dioxide (NO2), and ozone (O3) with weight, BMI, waist circumference, fat mass, lean mass, and proportion fat mass in midlife women.
Summary of Findings: In this prospective cohort study of 1,654 midlife women representing diverse racial/ethnic groups, exposure to air pollution was associated with adverse changes in body composition measures. In particular, PM2.5 and NO2 were positively associated with fat mass and proportion fat mass, and inversely associated with lean mass. In addition, O3 was positively associated with proportion fat mass and inversely associated with lean mass. Associations of PM2.5 and NO2 with body size and composition were modified by physical activity; associations were attenuated among participants with higher physical activity levels.
[WG#1074]

11 Appelhans BM, Gabriel KP, Lange-Maia BS, Karavolos K, Ylitalo KR, Karvonen-Gutierrez CA, Kravitz HM, Janssen I **Longitudinal associations of midlife employment status with impaired physical function in the Study of Women's Health Across the Nation** Annals of Epidemiology Appelhans BM, Gabriel KP, Lange-Maia BS, Karavolos K, Ylitalo KR, Karvonen-Gutierrez CA, Kravitz HM, Janssen I. Longitudinal associations of mid-life employment status with impaired physical function in the Study of Women's Health Across the Nation. Ann Epidemiol. 2022 Oct;74:15-20. doi: 10.1016/j.annepidem.2022.06.001. Epub 2022 Jun 15. PMID: 35714876; PMCID: PMC10214385.

Primary Question: Is employment status a risk factor for poor physical function in midlife women?
Summary of Findings: Women with lower levels of employment from mid-life to older adulthood were more likely to experience severe impairment in physical function. These associations are not driven by adiposity, physical activity, or health-related variables.
[WG#1018]

12 Qi M, Chen X, Krauss RM, Matthews K, Janssen I, Brooks MM, McConnell D, Crawford SL, El Khoudary SR **Lipoprotein subfractions and subclinical vascular health in middle aged women: does menopause status matter?** Menopause Qi M, Chen X, Krauss RM,

Matthews K, Janssen I, Brooks MM, McConnell D, Crawford SL, El Khoudary SR. Lipoprotein subfractions and subclinical vascular health in middle aged women: does menopause status matter? Menopause. 2022 Aug 1;29(8):911-919. doi: 10.1097/GME.0000000000001998. Epub 2022 Jul 12. PMID: 35819840; PMCID: PMC9339472.
Primary Question:
Is there clear relationship between specific group of lipoproteins and subclinical atherosclerosis among perimenopausal women, after taking remaining lipoproteins into consideration? Does this relationship change by women's menopausal status?

Summary of Findings: Carotid intimal medial thickening is positively associated with a clusteri of small IDL particles in midlife women, and with a cluster of small and medium LDL particles after menopause.
[WG#1062]

13 Ding N, Karvonen-Gutierrez CA, Mukherjee B, Calafat AM, Harlow SD, Park, SK. **Per- and Polyfluoroalkyl Substances and Incident Hypertension in Multi-Racial/Ethnic Women: The Study of Women's Health Across the Nation** Hypertension Ding N, Karvonen-Gutierrez CA, Mukherjee B, Calafat AM, Harlow SD, Park SK. Per- and Polyfluoroalkyl Substances and Incident Hypertension in Multi-Racial/Ethnic Women: The Study of Women's Health Across the Nation. Hypertension. 2022 Aug;79(8):1876-1886. doi: 10.1161/HYPERTENSIONAHA.121.18809. Epub 2022 Jun 13. PMID: 35695012; PMCID: PMC9308661
Primary Question: Per- and polyfluoroalkyl substances (PFAS) can trigger a combination of pathophysiological responses that may lead to hypertension. However, human evidence to support this hypothesis is scant. We examined the association between PFAS and risks of developing hypertension.
Summary of Findings: We found that women with higher serum concentrations of perfluorooctane sulfonate (PFOS), perfluorooctanoate (PFOA), and 2-(N-ethyl-perfluorooctane sulfonamido) acetate (EtFOSAA) had a higher risk of developing hypertension. No significant associations were observed for perfluorononanoate (PFNA) and perfluorohexane sulfonate (PFHxS).

[WG#877MS14]

14 Ylitalo K, Karvonen-Gutierrez C, Sternfeld B, Gabriel K. **Quantifying Physical Activity Across the Midlife: Does Consideration of Perceived Exertion Matter?** Prev Med Rep Ylitalo KR, Karvonen-Gutierrez CA, Oh M, Sternfeld B, Stamey J, Pettee Gabriel K. Quantifying physical activity across the midlife: Does consideration of perceived exertion matter? Prev Med Rep. 2022 Jun 10;28:101850. doi: 10.1016/j.pmedr.2022.101850. PMID: 35757579; PMCID: PMC9213249
Primary Question: Changes in heart rate and breathing during physical activity can influence perceptions of exertion. This study compared estimates of physical activity with and without adjustments for perceived exertion.
Summary of Findings: Approximately three-fourths of participants reported any planned exercise activities or sports during the previous year. The most common planned exercise activity for all participants was walking and the most common perceived exertion level was a “moderate” increase in heart rate and breathing during physical activity. For most women, adjusting for perceived exertion did not substantially change estimates of physical activity

dose.
[WG#1028]

15 Bielak LF, Peyser PA, Smith JA, Zhao W, Ruiz-Narvaez EA, Kardia SLR, Harlow SD **Multivariate, region-based genetic analyses of facets of reproductive aging in White and Black women** Mol Genet Genomic Med Bielak LF, Peyser PA, Smith JA, Zhao W, Ruiz-Narvaez EA, Kardia SLR, Harlow SD. Multivariate, region-based genetic analyses of facets of reproductive aging in White and Black women. Mol Genet Genomic Med. 2022 Apr;10(4):e1896. doi: 10.1002/mgg3.1896. Epub 2022 Feb 18. PMID: 35179313; PMCID: PMC9000932
Primary Question:
Summary of Findings:
[WG#994MS3]

16 Nasr A, Matthews K, Janssen I, Brooks MM, Barinas-Mitchell E, Orchard TJ, Billheimer J, Wang NC, McConnell D, Rader DJ, El Khoudary SR **Associations of Abdominal and Cardiovascular Adipose Tissue Depots With HDL Metrics in Midlife Women: the SWAN Study** JCEM Nasr A, Matthews K, Janssen I, Brooks MM, Barinas-Mitchell E, Orchard TJ, Billheimer J, Wang NC, McConnell D, Rader DJ, El Khoudary SR. Associations of Abdominal and Cardiovascular Adipose Tissue Depots With HDL Metrics in Midlife Women: the SWAN Study. J Clin Endocrinol Metab. 2022 May 17;107(6):e2245-e2257. doi: 10.1210/clinem/dgac148. PMID: 35298649; PMCID: PMC9113818.
Primary Question: Are higher volumes of abdominal visceral and cardiovascular (epicardial, paracardial and perivascular aortic) adipose tissue depots at midlife associated with a worse high-density lipoprotein (HDL) metric profile [lower HDL cholesterol efflux capacity (HDL-CEC), lower concentrations of HDL phospholipids (HDL-PL) and large HDL particles (HDL-P), smaller overall HDL size, and increases in levels of HDL triglycerides (HDL-Tg) and small HDL-P]?

Does insulin resistance mediate the observed associations between different adipose tissue depots and HDL metrics?
Summary of Findings: After adjusting for potential confounders, higher abdominal visceral adipose tissue volume was associated with lower concentrations of HDL-PL contents, HDL-cholesterol (HDL-C) and large HDL-P subclasses, and smaller overall HDL size.
Higher paracardial fat (PAT) volume was associated with lower concentrations of HDL-C and large HDL-P, and smaller overall HDL size. Higher epicardial fat (EAT) volume was associated with more small HDL-P concentrations. Higher perivascular aortic adipose tissue (PVAT) was associated with lower HDL-CEC.

Insulin resistance (IR) partially mediated the associations between adipose tissue depots and HDL metrics as following:
IR mediated the associations between HDL-CEC, HDL-C, large HDL-P, and HDL size. IR also mediated the associations between PAT and HDL-C, large HDL-P and HDL size, and the associations between PVAT and HDL-CEC.

[WG#1014]

17 Napoleone JM, Boudreau RM, Lange-Maia BS, El Khoudary SR, Ylitalo KR, Kriska AM,

Karvonen-Gutierrez CA, Strotmeyer ES **Metabolic Syndrome Trajectories and Objective Physical Performance in Mid-to-Early Late Life: The Study of Women's Health Across the Nation (SWAN).** Gerontol A Biol Sci Med Sci. Napoleone JM, Boudreau RM, Lange-Maia BS, El Khoudary SR, Ylitalo KR, Kriska AM, Karvonen-Gutierrez CA, Strotmeyer ES. Metabolic Syndrome Trajectories and Objective Physical Performance in Mid-to-Early Late Life: The Study of Women's Health Across the Nation (SWAN). J Gerontol A Biol Sci Med Sci. 2022 Feb 3;77(2):e39-e47. doi: 10.1093/gerona/glab188. PMID: 34216218; PMCID: PMC8824556.
Primary Question: Do patterns of metabolic syndrome during midlife impact physical performance in early old age?
Summary of Findings: SWAN women with =3 metabolic syndrome (MetS; high-MetS) components compared to those with no MetS components had higher body mass index, pain, financial strain, and lower physical activity and self-reported health at visit 15 (p<0.0001). Compared to Caucasian women, African American and Hispanic women were more likely to be in the high-MetS group and had worse physical functioning along with Chinese women (SPPB, chair stand, stair climb, and gait speed but Hispanic women did not have worse gait speed). After adjustments, high-MetS compared to no MetS demonstrated significantly worse 40-ft walk (ß: -0.08; 95% CI: -0.13, -0.03), 4-m gait speed (ß: -0.09; 95% CI: -0.15, -0.02), SPPB (ß: -0.79; 95% CI: -1.15, -0.44), and chair stands (ß:0.69; 95% CI: 0.09, 1.28), though worse stair climb was not significant after adjustments. Excluding women with previous moderate or severe perceived physical function limitations did not change final models.
[WG#1012]

18 Harlow SD, Burnett-Bowie SM, Greendale GA, Avis NE, Reeves AN, Richards TR, Lewis TT **Disparities in Reproductive Aging and Midlife Health between Black and White women: The Study of Women's Health Across the Nation (SWAN).** Womens Midlife Health 2022 Feb 8;8(1):3. PMID: 35130984; PMCID: PMC8822825.
Primary Question: How do SWAN findings help us understanding racial/ethnic health disparities in women's midlife health?
Summary of Findings: This SWAN story documents the presence, magnitude, and longitudinal patterns of racial disparities in selected areas of women's midlife health (menopause symptoms, sleep, mental health, health-related quality of life, cardio-metabolic health, and physical function) and considers the contextual factors that are likely influencing these disparities.
[WG#1061]

19 El Khoudary SR, Nasr A, Billheimer J, Brooks MM, McConnell D, Crawford S, Orchard TJ, Rader DJ, Matthews KA **Associations of Endogenous Hormones With HDL Novel Metrics Across the Menopause Transition: The SWAN HDL Study** Journal of Clinical Endocrinology and Metabolism El Khoudary SR, Nasr A, Billheimer J, Brooks MM, McConnell D, Crawford S, Orchard TJ, Rader DJ, Matthews KA. Associations of Endogenous Hormones With HDL Novel Metrics Across the Menopause Transition: The SWAN HDL Study. J Clin Endocrinol Metab. 2022 Jan 1;107(1):e303-e314. doi: 10.1210/clinem/dgab595. PMID: 34390340; PMCID: PMC8684446
Primary Question: Are levels of estradiol (E2) and/or follicle-stimulating hormones (FSH) over the menopause transition associated with an adverse HDL metric profile [lower HDL cholesterol efflux capacity (HDL-CEC), lower concentrations of HDL phospholipids (HDL-PL) and large HDL particles (HDL-P), smaller overall HDL size, and increases in levels of HDL

triglycerides (HDL-Tg) and small HDL-P]? Do these associations vary by time since menopause?
Summary of Findings:
Higher levels of estradiol are associated with larger HDL particle size, higher levels of large HDL-P, HDL-CEC and HDL-Tg, but with lower levels of medium HDL-P. The positive association between E2 and HDL-Tg was stronger 2 years after the final menstrual period (FMP) than before. FSH was related to higher total and medium HDL-P, but with smaller HDL particle size, and lower concentrations of large HDL-P, and HDL-CEC per particle. The associations of higher FSH with greater total HDL-P and smaller HDL size were only evident at or after menopause.

[WG#1040]

20 Darssan D, Mishra GD, Greenwood DC, Sandin S, Brunner EJ, Crawford SL, El Khoudary SR, Brooks MM, Gold EB, Simonsen MK, Chung HF, Weiderpass E, Dobson AJ **Meta-analysis for individual participant data with a continuous exposure: A case study.** Journal of Clinical Epidemiology Darssan D, Mishra GD, Greenwood DC, Sandin S, Brunner EJ, Crawford SL, El Khoudary SR, Brooks MM, Gold EB, Simonsen MK, Chung HF, Weiderpass E, Dobson AJ. Meta-analysis for individual participant data with a continuous exposure: A case study. J Clin Epidemiol. 2021 Dec;140:79-92. doi: 10.1016/j.jclinepi.2021.08.033. Epub 2021 Sep 4. PMID: 34487835.
Primary Question:
Summary of Findings:
[WG#1031PUD]

21 Kolli A, Hood MM, Karvonen-Gutierrez C, Moroi SE, Ehrlich JR, Gillespie BW, Dougherty Wood S, Musch DC **Midlife Vision Impairment and Cognitive Function in Later Life: The Study of Women's Health Across the Nation, Michigan Cohort** J Gerontol A Biol Sci Med Sci 2021 Nov 15;76(12):2178-2186. doi: 10.1093/gerona/glab180. PMID: 34153092 PMCID: PMC8598988
Primary Question: Prior studies have suggested that poor vision in later life is associated with worse cognitive function. We aim to assess whether there is a similar relationship between vision in mid-life and future cognitive function.
Summary of Findings: Moderate or worse vision impairment, assessed during mid-life, was associated with lower scores on measures of cognitive function over a 13 year period during which women transitioned from mid-life to later adulthood. Prior studies have suggested a relationship between vision and cognition in older age; this study supports an analogous relationship in mid-life.
[WG#1027]

22 El Khoudary SR, Nasr A, Matthews KA, Orchard TJ, Brooks MM, Billheimer J, McConnell D, Janssen I, Everson-Rose SA, Crawford S, Rader DJ **Associations of HDL metrics with coronary artery calcium score and density among women traversing menopause** Journal of Lipid Research El Khoudary SR, Nasr A, Matthews KA, Orchard TJ, Brooks MM, Billheimer J, McConnell D, Janssen I, Everson-Rose SA, Crawford S, Rader DJ. Associations of HDL metrics with coronary artery calcium score and density among women traversing menopause. J Lipid Res. 2021;62:100098. doi: 10.1016/j.jlr.2021.100098. Epub 2021 Jul 22. PMID: 34303684; PMCID: PMC8385165

Primary Question: Are different metrics of HDL associated with CAC presence or CAC density, and does menopausal stage modify the association of HDL metrics with CAC presence and CAC density?
Summary of Findings: Only medium HDL-particle (HDL-P) concentrations was independently associated with
Higher odds of CAC presence; none of the HDL metrics were associated with CAC density. However, menopause status modified the associations between HDL metrics and measures of CAC, where higher small HDL-P and smaller overall HDL size were associated with higher odds of CAC presence in the late perimenopausal stage compared to the pre/early perimenopause stage. Lower large HDL-P and smaller overall HDL size were associated with lower CAC density in the late perimenopausal stage.

[WG#1000]

23 Greendale GA, Han W, Finkelstein JS, Burnett-Bowie SM, Huang M, Martin D, Karlamangla AS **Changes in Regional Fat Distribution and Anthropometric Measures Across the Menopause Transition** J Clin Endocrinol Metab Greendale GA, Han W, Finkelstein JS, Burnett-Bowie SM, Huang M, Martin D, Karlamangla AS. Changes in Regional Fat Distribution and Anthropometric Measures Across the Menopause Transition. J Clin Endocrinol Metab. 2021 Aug 18;106(9):2520-2534. doi: 10.1210/clinem/dgab389. PMID: 34061966; PMCID: PMC8372653.

Primary Question:
Does the menopause transition (MT) influence regional fat distribution and waist and hip circumferences?
Summary of Findings: The transition from pre- to postmenopause is accompanied by an increase in central fat stores and a decrease in peripheral fat stores. Accelerated gains in visceral, android and gynoid fat mass are associated with the onset of the MT. There are no similar changes in the rates of waist or hip circumference during the MT.
[WG#1017]

24 Wang X, Karvonen-Gutierrez CA, Herman WH, Mukherjee B, Harlow SD, Park SK. **Urinary Heavy Metals and Longitudinal Changes in Blood Pressure in Midlife Women: The Study of Women's Health Across the Nation** Hypertension 2021 Aug;78(2):543-551. doi: 10.1161/HYPERTENSIONAHA.121.17295. Epub 2021 Jun 21. PMID: 34148361; PMCID: PMC8266752.
Primary Question: Environmental exposure to heavy metals may contribute to increased blood pressure, however, evidence from midlife women who are at greater risk of cardio-metabolic disease, is limited. We evaluated the associations of urinary concentrations of arsenic, cadmium, mercury, and lead with longitudinal changes in blood pressure in the Study of Women's Health Across the Nation Multi-Pollutant Study.
Summary of Findings: After multivariable adjustment, estimated annualized increases (95%CI) in SBP in the highest and lowest tertiles were 0.93 (0.85, 1.01) mmHg and 0.74 (0.66, 0.82) mmHg for arsenic, 0.82 (0.75, 0.90) mmHg and 0.72 (0.65, 0.80) mmHg for mercury, and 0.86 (0.78, 0.93) mmHg and 0.72 (0.64, 0.79) mmHg for lead, respectively. Similar results were observed for associations of arsenic, mercury, lead with DBP. Urinary cadmium was associated with a greater rate of increase in SBP only among never smokers.

[WG#877MS13]

25 Ding N, Karvonen-Gutierrez CA, Herman WH, Calafat AM, Mukherjee B, Park SK **Associations of perfluoroalkyl and polyfluoroalkyl substances (PFAS) and PFAS mixtures with adipokines in midlife women** Int J Hyg Environ Health Ding N, Karvonen-Gutierrez CA, Herman WH, Calafat AM, Mukherjee B, Park SK. Associations of perfluoroalkyl and polyfluoroalkyl substances (PFAS) and PFAS mixtures with adipokines in midlife women. Int J Hyg Environ Health. 2021 Jun;235:113777. doi: 10.1016/j.ijheh.2021.113777. Epub 2021 Jun 2. PMID: 34090141; PMCID: PMC8207532
Primary Question: Perfluoroalkyl and polyfluoroalkyl substances (PFAS) exposure have been associated with obesity and related comorbidities. However, underlying mechanisms are not well understood. Therefore, we determined if serum PFAS concentrations were associated with adipokine profiles in midlife women.
Summary of Findings: We found that leptin concentrations and free leptin index (the ratio of leptin to soluble leptin receptor) at a 3-year follow-up were significantly higher in women with higher baseline concentrations of various PFAS compounds. In contrast, PFAS concentrations were not associated with soluble leptin receptor, total adiponectin, or high molecular weight adiponectin.
[WG#877MS11]

26 Ylitalo KR, Karvonen-Gutierrez CA, Sternfeld B, Pettee Gabriel K. **Association of Physical Activity and Physical Functioning Phenotypes With Fall Risk Among Women.** J Aging Health Ylitalo KR, Karvonen-Gutierrez CA, Sternfeld B, Pettee Gabriel K. Association of Physical Activity and Physical Functioning Phenotypes With Fall Risk Among Women. J Aging Health. 2021 Jun-Jul;33(5-6):409-417. doi: 10.1177/0898264320988405. Epub 2021 Jan 31. PMID: 33517822; PMCID: PMC8356562.
Primary Question: Do physical activity behavior and physical functioning influence fall risk among older adult women?
Summary of Findings: Women with low physical activity and poor physical functioning are more likely to fall compared to women with high physical activity and good physical functioning. Women who experience declining physical functioning over time are more likely to fall, but women who increase physical activity over time are not more likely to fall. Women can be physically activity to the extend they are able without increasing fall risk, even among those with physical functioning limitations.
[WG#1029]

27 Ding N, Karvonen-Gutierrez CA, Herman WH, Calafat AM, Mukherjee B, Park SK **Perfluoroalkyl and polyfluoroalkyl substances and body size and composition trajectories in midlife women: the study of women's health across the nation 1999-2018** Int J Obes (Lond) 2021 May 13. doi: 10.1038/s41366-021-00848-9. Online ahead of print. PMID: 33986457
Primary Question: We aimed to examine associations of serum PFAS concentrations with longitudinal changes in weight, waist circumference (WC), fat mass, and proportion fat in midlife women.
Summary of Findings: PFOS, PFOA, EtFOSAA and MeFOSAA serum concentrations during midlife were positively associated with large body size and body fat in midlife women. Higher PFOS, PFHxS, EtFOSAA and MeFOSAA at baseline were also associated with accelerated increases in measures of adiposity over time. PFAS may be an underappreciated

contributing factor to women's obesity risk.
[WG#877MS7]

28 Wang X, Karvonen-Gutierrez CA, Mukherjee B, Herman WH, Park SK. **Urinary Metals and Adipokines in Midlife Women: Study of Women's Health Across the Nation (SWAN)** Environ Res 2021 May;196:110426. doi: 10.1016/j.envres.2020.110426. Epub 2020 Nov 4. PMID: 33157106 PMCID: PMC8093324
Primary Question: Epidemiologic studies on associations between metals and adipokines have been limited and results are mixed. We examined the associations of 15 urinary metal concentrations with prospectively-assessed serum levels of adipokines including HMW adiponectin, leptin, and soluble leptin receptor (sOB-R).
Summary of Findings: In multivariable adjusted adaptive elastic-net models, urinary molybdenum was associated with a 5.54% higher level (95% CI: 1.36%, 9.90%), whereas cadmium was associated with a 4.53% lower level (95% CI: -8.17%, -0.76%) of HMW-adiponectin. Urinary molybdenum was also associated with a 5.95% lower leptin level (95% CI: -10.15%, -1.56%) and a 2.98% (95% CI: 0.69%, 5.32%) higher sOB-R level. Urinary cesium and lead were associated with a 3.58% (95% CI: -6.06%, -1.03%) and a 2.53% (95% CI: -4.80%, -0.21%) lower level of sOB-R, respectively.
[WG#877MS8]

29 Yi Y, El Khoudary SR, Buchanich JM, Miller RG, Rubinstein D, Matthews K, Orchard TJ, Costacou T **Women with Type 1 diabetes (T1D) experience a shorter reproductive period compared with nondiabetic women: the Pittsburgh Epidemiology of Diabetes Complications (EDC) study and the Study of Women's Health Across the Nation (SWAN).** Menopause 2021 Mar 1;28(6):634-641. doi: 10.1097/GME.0000000000001758. PMID: 33651743
Primary Question: Whether the length of reproductive period, age at menarche, and age at natural menopause differ in women with type 1 diabetes, compared to women without diabetes.
Summary of Findings: Women with type 1 diabetes onset before menarche have a shorter reproductive period compared with non-diabetic women, exhibiting delayed menarche and earlier natural menopause.
[WG#1015]

30 Greendale GA, Han W, Huang M, Upchurch DM, Karvonen-Gutierrez C, Avis NE, Karlamangla AS. **Longitudinal Assessment of Physical Activity and Cognitive Outcomes Among Women at Midlife** JAMA Netw Open 2021 Mar 1;4(3):e213227. doi: 10.1001/jamanetworkopen.2021.3227. PMID: 33787912. PMC8013795
Primary Question: Do higher amounts of physical activity during middle age slow cognitive aging?
Summary of Findings: We did not find evidence that greater physical activity was related to either better cognitive scores at the beginning of the study, when women were in their 50's, or less cognitive decline during up to 13 years of follow up.
[WG#951MS]

31 Chung HF, Zhu D, Dobson AJ, Kuh D, Gold EB, Crawford SL, Avis NE, Mitchell ES, Woods NF, Anderson DJ, Mishra GD **Age at menarche and risk of vasomotor menopausal symptoms in midlife: a pooled analysis of six studies** BJOG 2021 Feb;128(3):603-613.

doi: 10.1111/1471-0528.16393. Epub 2020 Jul 21. PMID: 33135854 PMCID: PMC7855657
Primary Question:
Summary of Findings:
[WG#1007PUD]

32 Karlamangla AS, Shieh A, Greendale GA. **Hormones and Bone Loss Across the Menopause Transition** Vitamins and Hormones 2021;115:401-417. doi: 10.1016/bs.vh.2020.12.016. Epub 2021 Jan 29. PMID: 33706956.
Primary Question:
Summary of Findings:
[WG#1041MS]

33 Wang X, Ding N, Harlow SD, Randolph JF Jr, Mukherjee B, Gold EB, Park SK **Urinary metals and metal mixtures and timing of natural menopause in midlife women: The Study of Women's Health Across the Nation.**
Primary Question: Limited data have reported the possible effects of various metals on the timing of natural menopause. In this study, we examined if women with higher urinary concentrations of metals and metal mixtures experienced natural menopause earlier using data from a prospective cohort of midlife women, the Study of Women's Health Across the Nation, from 1999 to 2018.
Summary of Findings: We found that women with higher urinary concentrations of arsenic, mercury, and lead reached natural menopause earlier. Women whose combined exposure to metals above the top 25 percentile had a 69% higher risk of reaching natural menopause than women in the bottom 25 percentile, which is equivalent to a 1 year earlier median time to natural menopause.
[WG#877MS12]

34 Lee S, Karvonen-Gutierrez C, Mukherjee B, Herman WH, Harlow SD, Park SK. **Urinary concentrations of phenols and parabens and incident diabetes in midlife women: The Study of Women's Health Across the Nation**
Primary Question: Although environmental exposure to personal care and product chemicals may play a role in the pathogenesis of diabetes, only a few phenols, most notably bisphenol A, have been studied with limited data. We examined associations between personal care and consumer product chemicals, assessed in urine at two time-points, and incident diabetes in the Study of Women's Health Across the Nation (SWAN), a multi-ethnic prospective cohort of midlife women.
Summary of Findings: We observed consistent inverse associations between parabens and incident diabetes at the Multi-pollutant study (MPS) baseline (1999-2000) and three-year later (2002-2003). Triclocarban with the 3-year exposure later baseline, dichotomized (yes/no) due to low detection rates (<15%), was positively associated with incident diabetes. Positive associations were found for 2,4-dichlorophenol only with the MPS baseline and for bisphenol-A only with the 3-year exposure later baseline. No significant associations were observed for the overall joint effect of phenol and paraben mixture at either time-points.
[WG#877MS9]

35 Mishra SR, Chung HF, Waller M, Dobson AJ, Greenwood DC, Cade JE, Giles GG, Bruinsma F, Simonsen MK, Hardy R, Kuh D, Gold EB, Crawford SL, Derby CA, Matthews KA, Demakakos P, Lee JS, Mizunuma H, Hayashi K, Sievert LL, Brown DE, Sandin S,

Weiderpass E, Mishra GD **The association Between Reproductive Life Span and Incident Nonfatal Cardiovascular Disease: A Pooled Analysis of Individual Patient Data From 12 Studies** JAMA Cardiol. 2020 Dec 1;5(12):1410-1418. doi: 10.1001/jamacardio.2020.4105. PMID: 32936210 PMCID: PMC7495334
Primary Question:
Summary of Findings:
[WG#1013PUD]

36 Zhu D, Chung HF, Dobson AJ, Pandeya N, Anderson DJ, Kuh D, Hardy R, Brunner EJ, Avis NE, Gold EB, El Khoudary SR, Crawford SL, Mishra GD **Vasomotor Menopausal Symptoms and Risk of Cardiovascular Disease: A pooled analysis of six prospective studies** Am J Obstet Gynecol 2020 Dec;223(6):898.e1-898.e16. doi: 10.1016/j.ajog.2020.06.039. Epub 2020 Jun 23. PMID: 32585222 PMCID: PMC7704910
Primary Question:
Summary of Findings:
[WG#1016PUD]

37 Wang X, Mukherjee B, Karvonen-Gutierrez CA, Herman WH, Batterman S, Harlow SD, Park SK. **Urinary Metal Mixtures and Longitudinal Changes in Glucose Homeostasis: The Study of Women's Health Across the Nation (SWAN)** Environ Int 2020 Dec;145:106109. doi: 10.1016/j.envint.2020.106109. Epub 2020 Sep 12. PMID: 32927284 PMCID: PMC7577932
Primary Question: Epidemiologic studies on associations between metals and insulin resistance and ß-cell dysfunction have been cross-sectional and focused on individual metals. We assessed the association between exposure to metal mixtures, based on assessment of 15 urinary metals, and longitudinal changes in homeostatic model assessments for insulin resistance (HOMA-IR) and ß-cell function (HOMA-ß).

Summary of Findings: In multivariable adjusted adaptive elastic-net models, urinary copper, lead, and zinc were associated with higher HOMA-IR at baseline, whereas molybdenum was associated with lower HOMA-IR at baseline. The estimated changes in baseline HOMA-IR for one standard deviation increase in log-transformed urinary metal concentrations were 1.57% (-1.09%, 4.29%) for copper, 0.70% (-1.59%, 3.05%) for lead, 5.76% (3.05%, 8.55%) for zinc, and -3.25% (-5.45%, -1.00%) for molybdenum, respectively. Urinary zinc was also positively associated with a faster rate of increase in HOMA-IR. Urinary arsenic and zinc were associated with lower baseline HOMA- ß, whereas cobalt was associated with higher baseline HOMA-ß. Arsenic was also associated with a faster rate of decline in HOMA-ß.

[WG#877MS6]

38 France M, Ma B, Gajer P, Brown S, Humphrys MS, Holm J, Waetjen E, Brotman R, Ravel J. **VALENCIA: A nearest centroid classification method for vaginal microbial communities based on composition** Microbiome 2020 Nov 23;8(1):166. doi: 10.1186/s40168-020-00934-6. PMID: 33228810 PMCID: PMC7684964
Primary Question: Can VALENCIA (VAginaL community state typE Nearest CentroId clAssifier), a tool developed to classify vaginal samples into community state types (CSTs) developed from over 13,000 reference vaginal samples from mostly reproductive age women

in the U.S. be used for assignment of samples to CSTs from other data sets, including postmenopausal women and women from other regions of the world?

Summary of Findings: VALENCIA provides a much-needed solution for the robust and reproducible assignment of vaginal CSTs, including for postmenopausal women. This will allow unbiased analysis of both small and large vaginal microbiota datasets, comparisons between datasets and meta-analyses that combine multiple datasets.

[WG#977MS2]

39 Ding N, Harlow SD, Randolph JF, Calafat AM, Mukherjee B, Batterman S, Gold EB, Park SK **Associations between Perfluoroalkyl Substances and Incident Natural Menopause: the Study of Women's Health Across the Nation 1999-2017** J Clin Endocrinol Metab 2020 Sep 1;105(9):dgaa303. doi: 10.1210/clinem/dgaa303. PMID: 32491182 PMCID: PMC7418447
Primary Question: We examined the associations between PFAS exposures and incidence of natural menopause in the multi-racial/ethnic sample of women who were premenopausal at baseline from a prospective cohort, i.e., the Study of Women's Health Across the Nation (SWAN), with standard approximately annual clinic visits from 1999-2017, and assessed whether the relationship differed by racial/ethnic groups. We next identified subgroups exposed to different patterns of PFAS using the k-means clustering method and evaluated the combined effects of PFAS mixtures on natural menopause.
Summary of Findings:
[WG#877MS5]

40 Greendale GA, Witt-Enderby P, Karlamangla AS, Munmun F, Crawford S, Huang M, Santoro N. **Melatonin patterns and levels during the human menstrual cycle and after menopause** Journal of the Endocrine Society 2020 Aug 27;4(11):bvaa115. doi: 10.1210/jendso/bvaa115. PMID: 33094207; PMCID: PMC7566378.
Primary Question:
Is melatonin, a hormone that controls sleep-wake cycles in humans, also involved in the control of the menstrual cycle?
Do melatonin levels go down when women become postmenopausal?
Summary of Findings: We found a rise in aMT6s, a melatonin metabolite that appears in the urine, at the end of the menstrual cycle (just before menses occurs). We believe that melatonin helps to regulate the menstrual cycle. After menopause, the amount of melatonin in the urine declines, suggesting that a drop in melatonin may be partly responsible for some of the symptoms of menopause.
[WG#1026]

41 Anderson DJ, Chung HF, Seib CA, Dobson AJ, Kuh D, Brunner EJ, Crawford SL, Avis NE, Gold EB, Greendale GA, Mitchell ES, Woods NF, Yoshizawa T, Mishra GD **Obesity, smoking, and risk of vasomotor menopausal symptoms during menopause: a pooled analysis of eight cohort studies** Am J Obstet Gynecol 2020 May;222(5):478.e1-478.e17. PMCID: PMC7196035
Primary Question:
Summary of Findings:
[WG#1003PUD]

42 Lin HS, Naimi AI, Brooks MM, Richardson GA, Burke JG, Bromberger JT **Life-course impact of child maltreatment on midlife health-related quality of life in women: longitudinal mediation analysis for potential pathways** Ann Epidemiol 2020 Mar;43:58-65. doi: 10.1016/j.annepidem.2020.01.005. Epub 2020 Jan 18. PMID: 32127250 PMCID: PMC7153694

Primary Question: 1) Is child maltreatment associated with lower health-related quality of life (HRQoL) and quality-adjusted life years (QALY) and the rate of change in these measures over a 9-year follow-up?
2) Are these associations explained by adulthood psychosocial mediators over time?

Summary of Findings: Any CM was associated with both reduced midlife mental and physical HRQoL over 9 years. Compared to women without CM, women who experienced multiple CM types reported 5 and 4 points lower in MCS and PCS, respectively, and 28 fewer healthy days per year for QALY. But the rate of change over time in these measures was similar between women with and without CM. In longitudinal mediation analyses, low levels of optimism, sleep problems, and low social support each explained >10% of the relationship between multiple CM types and HRQoL and QALY.
[WG#814MS2]

43 Ding N, Harlow SD, Batterman S, Mukherjee B, Park SK **Longitudinal trends in perfluoroalkyl and polyfluoroalkyl substances among multiethnic midlife women from 1999 to 2011: The Study of Women's Health Across the Nation** Environ Int. 2020 Feb;135:105381. doi: 10.1016/j.envint.2019.105381. Epub 2019 Dec 13. PMID: 31841808. PMCID: PMC7374929

Primary Question: This study examined temporal variations in serum concentrations of per- and polyfluoroalkyl substances (PFAS), a family of synthetic compounds widely used in a variety of industrial applications and consumer products, such as non-stick cookware, carpeting, apparels, food packaging, and firefighting forms, in midlife women. Specifically, we explored how patterns of exposure differ by race/ethnicity and reproductive characteristics.

Summary of Findings: Serum concentrations of legacy compounds (e.g. perfluorooctanoic acid, PFOA, and perfluorooctane sulfonic acid, PFOS) decreased significantly; whereas their replacements (e.g. perfluorononanoic acid, PFNA) increased from 1999-2011. Temporal variations varied significantly by race/ethnicity. For example, Chinese women tended to have consistently higher PFNA concentrations at each follow-up visit, compared to white and black women. Menstruating women also had lower concentrations over time. Parity was associated with lower concentrations at baseline but the differences between nulliparous and parous women narrowed during the follow-up visits.
[WG#877MS3]

44 Park SK, Peng Q, Ding N, Mukherjee B, Harlow S **Determinants of per- and polyfluoroalkyl substances (PFAS) in midlife women: Evidence of racial/ethnic and geographic differences in PFAS exposure** Environ Res. 2019 Aug;175:186-199. doi: 10.1016/j.envres.2019.05.028. Epub 2019 May 18. PMID: 31129528 PMCID: PMC6579633

Primary Question:

Summary of Findings:

[WG#877_MS2]

45 Chung HF, Pandeya N, Dobson A, Kuh D, Brunner E, Crawford S, Avis N, Gold EB, Mitchell E, Woods NF, Bromberger J, Thurston R, Joffe H, Yoshizawa T, Anderson D, Mishra G, **The role of sleep difficulties in the vasomotor menopausal symptoms and depressed mood relationships: an international pooled analysis of eight studies in the InterLACE consortium** Psychology of Medicine 2018 Nov;48(15):2550-2561. doi: 10.1017/S0033291718000168. Epub 2018 Feb 12. PMID: 29429422 PMCID: PMC6087679
Primary Question:
Summary of Findings: In this pooled study that included 21,312 midlife women from eight observational studies, we observed a prospective bi-directional relationship between VMS and depressed mood. Baseline sleep difficulties largely affected the relationship between VMS and subsequent depressed mood over three years, but it had little impact on the relationship between depressed mood and subsequent VMS.
[WG#843PUD]

46 Zhu D, Chung H-F, Pandeya N, Dobson AJ, Kuh D, Crawford SL, Gold EB, Avis NE, Giles GG, Bruinsma F, Adami H-O, Weiderpass E, Greenwood DC, Cade JE, Mitchell ES, Woods NF, Brunner EJ, Kildevaeld Simonsen M, Mishra GD. **Body mass index and age at natural menopause: an international pooled analysis of 11 prospective studies** Eur J Epidemiol. 2018 Aug;33(8):699-710. doi: 10.1007/s10654-018-0367-y. Epub 2018 Feb 19. PMID 29460096
Primary Question:
Summary of Findings: Current evidence on the association between body mass index (BMI) and age at menopause remains unclear. We
investigated the relationship between BMI and age at menopause using data from 11 prospective studies. A total of 24,196
women who experienced menopause after recruitment was included. Baseline BMI was categorised according to the WHO
criteria. Age at menopause, confirmed by natural cessation of menses for C 12 months, was categorised as\45 years
(early menopause), 45–49, 50–51 (reference category), 52–53, 54–55, and C 56 years (late age at menopause). We used
multinomial logistic regression models to estimate multivariable relative risk ratios (RRRs) and 95% confidence intervals
(CI) for the associations between BMI and age at menopause. The mean (standard deviation) age at menopause was 51.4
(3.3) years, with 2.5% of the women having early and 8.1% late menopause. Compared with those with normal BMI
(18.5–24.9 kg/m2), underweight women were at a higher risk of early menopause (RRR 2.15, 95% CI 1.50–3.06), while
overweight (1.52, 1.31–1.77) and obese women (1.54, 1.18–2.01) were at increased risk of late menopause. Overweight
and obesity were also significantly associated with around 20% increased risk of menopause at ages 52–53 and
54–55 years. We observed no association between underweight and late menopause. The risk of early menopause was
higher among obese women albeit not significant (1.23, 0.89–1.71). Underweight women had over twice the risk of
experiencing early menopause, while overweight and obese women had over 50% higher risk of experiencing late

menopause.
[WG#986PUD]

47 Mishraa G, Chunga H, Pandeyaa N, Dobsona A, Jones L,Avis N, Crawford S, Gold E, Brown D, Sievertf L, Brunnerg E, Cade J, Burley V, Greenwood D, Giles G, Bruinsma F, Goodman A, Hayashi K, Lee J, Mizunuma H, Kuh D, Cooper R, Hardy R, Obermeyer CM, Lee K,, Simonsen MK, Yoshizawa T, Woods NF, MItchell ES, Hamer M, Demakakos P, Sandin S, Adami HO, Weiderpass E, Anderson D **The InterLACE study: Design, data harmonization and characteristics across 20 studies on women's health** Maritus 2016 Oct;92:176-85. doi: 10.1016/j.maturitas.2016.07.021. Epub 2016 Aug 4. PMID: 27621257. PMCID: PMC5378383

Primary Question:

Summary of Findings: Overall, 76% of the women were Caucasian, 22% Japanese, and other ethnicity (of 300 or more participants) included Hispanic/Latin American (0.2%), Chinese (0.2%), Middle Eastern (0.3%), African/black (0.5%), and Other (1.0%). The median age at baseline was 47 years (Inter-quartile range (IQR): 41-53), and that at the last follow-up was 56 years (IQR: 48-64). Regarding reproductive characteristics, half of the women (49.8%) had their first menstruation (menarche) at 12-13 years of age. The distribution of menopausal status and the prevalence of chronic disease varied considerably among studies. At baseline, most women (57%) were pre- or peri-menopausal, 20% reported a natural menopause (range 0.8-55.6%), and remaining had surgery or were taking hormones. By the end of follow-up, the prevalence of CVD and diabetes were 7.2% (range 0.9-24.6%) and 4.7% (range 1.3-13.2%), respectively.

[WG#754PUD]