THURSDAY CONCURRENT SESSION #1

S-1.

Effect of fezolinetant on sleep disturbance and impairment in women with and without sleep disturbance at baseline: data from two phase 3 studies

Marla Shapiro C.M.[2], Petra Stute[1], Antonia Morga[3], Martin Blogg[3], Xuegong Wang[4], Yana Labinov[4], Karla Martins[3], Antonio Cano[5]. [1]University Clinic for Gynecology, Inselspital, Bern, Switzerland; [2]University of Toronto, Toronto, ON, Canada; [3]Astellas Pharma Europe Ltd, Addlestone, United Kingdom; [4]Astellas Pharma Global Development, Northbrook, IL; [5]University of Valencia – INCLIVA, Valencia, Spain

Objective: The use of the nonhormonal, selective neurokinin 3 receptor antagonist fezolinetant to reduce vasomotor symptoms (VMS) due to menopause can also lead to improvements in patient-reported sleep disturbance and impairment. This post hoc analysis assessed sleep disturbance and impairment in women with or without sleep disturbance at baseline using data from two phase 3 studies. **Design:** In SKYLIGHT 1 (NCT04003155) and 2 (NCT04003142) women (≥40–≤65 years) with moderate-to-severe VMS due to menopause were randomized to receive daily placebo, or fezolinetant 30 mg or 45 mg during a 12-week randomized, double-blind treatment period. Completers entered a 40-week extension period; the fezolinetant group continued their initial dose and the placebo group was re-randomized to fezolinetant 30 mg or 45 mg. Mean change in the Patient-Reported Outcomes Measurement Information System Sleep Disturbance – Short Form 8b (PROMIS SD SF 8b) total score from baseline to week 12 was a key secondary endpoint. Mean change in the PROMIS Sleep-Related Impairment – Short Form 8a (PROMIS SRI SF 8a) total score from baseline to each visit was an exploratory endpoint. The proportion of PROMIS SD SF 8b responders was assessed; defined previously as a reduction in total score of ≥8. Sleep disturbance at baseline was identified if an individual had a PROMIS SD SF 8b T-score of ≥55. All assessments compared change from baseline to weeks 12 and 52. Least square means and 95% confidence intervals (CIs) were generated using a mixed model repeated measures approach to assess change from baseline in PROMIS SD SF 8b or PROMIS SRI SF 8a. For the responder analysis at week 12, odds ratios and 95% CIs were generated using a logistic regression model. At week 52, 95% CIs were calculated using the Clopper-Pearson exact method. Pooled 95% CIs are for descriptive purposes only and are not adjusted for multiplicity. **Results:** Overall, 1022 women received ≥1 dose of study drug (sleep disturbance: no, 372 women; sleep disturbance: yes, 648 women; missing, 2 women). Larger improvements in sleep disturbance and impairment and higher proportions of responders were typically noted for women with sleep disturbance at baseline (Table). For change from baseline to week 12, improvements in sleep disturbance and impairment were consistently noted with both doses of fezolinetant vs placebo for women with and without sleep disturbance at baseline. Higher proportions of responders were noted with fezolinetant than placebo at week 12. The effects seen at week 12 were maintained through to week 52. **Conclusion:** The use of fezolinetant to effectively reduce VMS also resulted in improvements in patient-reported sleep disturbance and impairment in women with and without sleep disturbance at baseline. These data demonstrate that the findings from SKYLIGHT 1 and 2 are generalizable to the wider population who are seeking treatment for VMS due to menopause.

Sources of Funding: Astellas Pharma Inc.

PROMIS SD SF 8b and PROMIS SRI SF 8a total score and responder results according to sleep disturbance at baseline: SKYLIGHT 1 and 2 pooled analysis

PROMIS SD SF 8b: baseline to week 12	Placebo (N = 342)	Fezolinetant 30 mg (N = 339)	Fezolinetant 45 mg (N = 341)
Sleep disturbance at baseline: no, n LS mean change (95% CI) from baseline LS mean difference (95% CI) vs placebo	106 –2.25 (–3.66, –0.85) –	103 –2.27 (–3.70, –0.85) –0.02 (–1.74, 1.70)	113 –3.98 (–5.38, –2.58) –1.73 (–3.42, –0.04)
Sleep disturbance at baseline: yes, n LS mean change (95% CI) from baseline LS mean difference (95% CI) vs placebo	186 –3.90 (–4.90, –2.89) –	172 –4.92 (–5.97, –3.87) –1.02 (–2.34, 0.29)	190 –5.20 (–6.19, –4.22) –1.31 (–2.59, –0.02)
PROMIS SRI SF 8a: baseline to week 12	Placebo (n = 342)	Fezolinetant 30 mg (n = 339)	Fezolinetant 45 mg (n = 341)
Sleep disturbance at baseline: no, n LS mean change (95% CI) from baseline LS mean difference (95% CI) vs placebo	106 –2.86 (–4.07, –1.65) –	102 –3.50 (–4.72, –2.29) –0.64 (–2.30, 1.01)	113 –4.59 (–5.76, –3.42) –1.73 (–3.36, –0.11)
Sleep disturbance at baseline: yes, n LS mean change (95% CI) from baseline LS mean difference (95% CI) vs placebo	186 –3.22 (–4.11, –2.33) –	172 –4.65 (–5.57, –3.72) –1.43 (–2.69, –0.16)	190 –4.21 (–5.09, –3.32) –0.99 (–2.22, 0.24)
PROMIS SD SF 8b: responders at week 12	Placebo (n = 342)	Fezolinetant 30 mg (n = 339)	Fezolinetant 45 mg (n = 341)
Sleep disturbance at baseline: no, n Responders, n (%) Odds ratio (95% CI) vs placebo	106 10 (9.4) –	103 14 (13.6) 1.630 (0.676, 4.066)	113 11 (9.7) 1.122 (0.440, 2.892)
Sleep disturbance at baseline: yes, n Responders, n (%) Odds ratio (95% CI) vs placebo	186 78 (41.9) –	172 83 (48.3) 1.221 (0.795, 1.876)	190 90 (47.4) 1.288 (0.847, 1.963)
PROMIS SD SF 8b: baseline to week 52		Fezolinetant 30 mg (n = 339)	Fezolinetant 45 mg (n = 341)
Sleep disturbance at baseline: no, n LS mean change (95% CI) from baseline		82 –5.36 (–7.13, –3.60)	92 –5.67 (–7.41, –3.93)
Sleep disturbance at baseline: yes, n LS mean change (95% CI) from baseline		135 –5.57 (–6.87, –4.26)	151 –6.70 (–7.88, –5.51)
PROMIS SRI SF 8a: baseline to week 52		Fezolinetant 30 mg (n = 339)	Fezolinetant 45 mg (n = 341)
Sleep disturbance at baseline: no, n LS mean change (95% CI) from baseline		82 –5.77 (–7.12, –4.43)	92 –4.88 (–6.18, –3.59)
Sleep disturbance at baseline: yes, n LS mean change (95% CI) from baseline		135 –5.27 (–6.30, –4.24)	151 –5.87 (–6.84, –4.89)
PROMIS SD SF 8b: responders at week 52		Fezolinetant 30 mg (n = 339)	Fezolinetant 45 mg (n = 341)
Sleep disturbance at baseline: no, n Responders, n (%) 95% CI in %		82 15 (18.3) 10.6, 28.4	92 20 (21.7) 13.8, 31.6
Sleep disturbance at baseline: yes, n Responders, n (%) 95% CI in %		135 73 (54.1) 45.3, 62.7	151 84 (55.6) 47.3, 63.7

S-2.

Efficacy and Safety of Fezolinetant in Hispanic/Latina Participants in Pooled SKYLIGHT Studies

Genevieve Neal-Perry, MD[1], Rossella E. Nappi[2,3], Martin Blogg[4], Yana Labinov[5], Karla Martins[4], Risa Kagan[6]. [1]University of North Carolina School of Medicine, Chapel Hill, NC; [2]Department of Clinical, Surgical, Diagnostic and Pediatric Sciences, University of Pavia, Pavia, Italy; [3]Research Center for Reproductive Medicine and Gynecological Endocrinology – Menopause Unit, Fondazione Policlinico IRCCS S. Matteo, Pavia, Italy; [4]Astellas Pharma Europe Ltd, Addlestone, United Kingdom; [5]Astellas Pharma Global Development, Northbrook, IL; [6]Department of Obstetrics, Gynecology and Reproductive Sciences, UCSF, Sutter East Bay Medical Group, Berkeley, CA

Objective: Hispanic/Latina women disproportionally experience bothersome vasomotor symptoms (VMS) due to menopause compared to Caucasian women. The objective was to analyze fezolinetant efficacy in Hispanic/Latina participants from pooled 12-week data from SKYLIGHT 1 and 2, and to assess fezolinetant safety in Hispanic/Latina participants from pooled 12-week and 52-week safety data from SKYLIGHT 1, 2, and 4. **Design:** Fezolinetant is an oral, nonhormonal, neurokinin 3 receptor antagonist treatment option for moderate-to-severe VMS due to menopause, and is approved in the US, Europe, and Australia at a dose of 45 mg once daily. SKYLIGHT 1 (NCT04003155) and SKYLIGHT 2 (NCT04003142) were two identical, phase 3, randomized, double-blind, placebo-controlled studies, and SKYLIGHT 4 (NCT04003389) was a phase 3, randomized, double-blind, 52-week safety study; all three studies were in participants with VMS due to menopause. Participants were women aged ≥40 to ≤65 years with moderate-to-severe VMS randomized 1:1:1 to placebo, fezolinetant 30 mg, or fezolinetant 45 mg once daily. Coprimary endpoints for SKYLIGHT 1 and 2 were mean change in frequency and severity of moderate-to-severe VMS from baseline to weeks 4 and 12. The primary endpoints for SKYLIGHT 4 were frequency and severity of treatment-emergent adverse events (TEAEs), percentages of participants with endometrial hyperplasia, and percentages of participants with endometrial malignancy. Participants self-identified ethnicity (Hispanic/Latina and Not Hispanic/Latina). **Results:** In total, 683 participants (n=342 placebo, n=341 fezolinetant 45 mg) were included from SKYLIGHT 1 and SKYLIGHT 2 for pooled efficacy analysis; 167 (24%) of these participants identified as Hispanic/Latina. 1901 participants were included from SKYLIGHT 1, 2, and 4 for pooled safety analysis (n=952 placebo, n=949 fezolinetant 45 mg); 415 (22%) of these participants identified as Hispanic/Latina. VMS frequency for Hispanic/Latina participants receiving fezolinetant 45 mg was lower at week 12 compared to placebo, least squares (LS) mean difference −2.23 (95% confidence interval [CI], −3.58 to −0.88, respectively). VMS severity at week 12 for Hispanic/Latina participants receiving fezolinetant 45 mg compared to placebo was LS mean difference −0.20 (95% CI, −0.42 to 0.02). At weeks 12 and 52, 7/204 (3%) and 14/204 (7%) Hispanic/Latina participants experienced drug-related TEAEs in the fezolinetant 45 mg group, respectively. At weeks 12 and 52, 0/204 and 3/240 (1%) Hispanic/Latina participants experienced serious TEAEs in the fezolinetant 45 mg group, respectively. No cases of Hy's law indicating drug-induced

liver injury were reported for Hispanic/Latina participants. **Conclusion:** Pooled phase 3 clinical data confirm the safety and efficacy of fezolinetant over 12 weeks and the safety of fezolinetant over 12 and 52 weeks in Hispanic/Latina participants. Efficacy and safety results were generally similar between Hispanic/Latina and Not Hispanic/Latina participants, and with the overall pooled population.

Sources of Funding: This study was funded by Astellas Pharma Inc.

S-3.

Efficacy Of Elinzanetant For The Treatment Of Vasomotor Symptoms Associated With Menopause: Pooled Data From Two Phase 3 Studies

JoAnn Pinkerton[1], James Simon[4], Hadine Joffe[2], Pauline Maki, PhD[3], Rossella E. Nappi[5], Nick Panay, FRCOG[6], Claudio Soares[7], Rebecca Thurston[8], Christiane Ahlers[9], Senka Djordjevic[10], Claudia Haberland[11], Lineke Zuurman[10]. [1]University of Virginia, Charlottesville, VA; [2]Brigham and Women's Hospital, Harvard Medical School, Boston, MA; [3]University of Illinois, Chicago, IL; [4]George Washington University, IntimMedicine Specialists, Washington, DC; [5]University of Pavia, Pavia, Italy; [6]Queen Charlotte's & Chelsea Hospital, Imperial College, London, United Kingdom; [7]Queen's University School of Medicine, Kingston, ON, Canada; [8]University of Pittsburgh, Pittsburgh, PA; [9]Bayer AG, Wuppertal, Germany; [10]Bayer CC AG, Basel, Switzerland; [11]Bayer AG, Berlin, Germany

Objective: Additional safe and effective non-hormonal treatments to alleviate bothersome menopausal vasomotor symptoms (VMS) and sleep disturbances are needed. OASIS 1 and OASIS 2 were pivotal randomized, phase 3 trials evaluating the efficacy and safety of elinzanetant 120 mg, a dual neurokinin-1 and -3 receptor antagonist, for the treatment of VMS associated with menopause. In separate analyses of these trials, elinzanetant showed significant reductions in VMS frequency and severity compared with placebo, improvements in sleep disturbances and menopause-related quality of life and a favorable safety profile. This exploratory pooled analysis aims to provide combined efficacy data from these trials. **Design:** Naturally or surgically postmenopausal women experiencing ≥50 moderate to severe VMS per week were randomized 1:1 to receive elinzanetant 120 mg for 26 weeks or placebo for 12 weeks followed by elinzanetant for 14 weeks. Endpoints in the pooled analysis included mean change in: frequency of moderate to severe VMS from baseline to weeks 1, 4, and 12; severity of moderate to severe VMS from baseline to weeks 4 and 12; and both PROMIS sleep disturbance short form (SD SF) 8b total T-score and Menopause-specific quality of life questionnaire (MENQOL) total score from baseline to week 12. Endpoints were analyzed by a mixed model with repeated measures, p values are indicative not confirmatory. **Results:** Overall, 796 women were randomized across both studies (elinzanetant [n=399] and placebo [n=397]). Demographic factors did not differ between treatment groups. Reductions from baseline in daily frequency of moderate to severe VMS were greater in the elinzanetant group than the placebo group at week 4 (mean [SD] -8.02 [7.65] and -5.24 [7.95], respectively) and week 12 (-9.35 [8.66] and -6.41 [9.36], respectively). From baseline, reductions with elinzanetant were nominally significant compared with placebo at week 4 and week 12, with significant reductions observed as early as week 1 (Table). Reductions from baseline in daily VMS severity were greater in the elinzanetant group than in the placebo group at week 4 (mean [SD] -0.74 [0.66] and -0.46 [0.50], respectively) and week 12 (-0.96 [0.78] and -0.61 [0.64], respectively). From baseline, reductions with elinzanetant were also nominally significant compared with placebo at week 4 and week 12 (Table). Reductions from baseline to week 12 in PROMIS SD SF 8b total T-score were greater in the elinzanetant group than the placebo group; -10.7 (8.7) and -5.3 (6.9), respectively. Reductions with elinzanetant were nominally significant compared with placebo at week 12 (Table). Reductions from baseline to week 12 in MENQOL total score were also greater in the elinzanetant group than the placebo group; -1.37 (1.29) and -0.96 (1.14), respectively. Reductions with elinzanetant were nominally significant compared with placebo (Table). In those who switched from placebo to elinzanetant after week 12, further numerical improvements were observed across VMS, PROMIS SD SF 8B and MENQOL measures up to week 26. **Conclusion:** Elinzanetant is a well-tolerated, efficacious, novel non-hormonal treatment that significantly improves VMS frequency and severity as well as sleep disturbances and menopause-related quality-of-life in postmenopausal women with moderate to severe VMS.

Sources of Funding: Bayer CC AG, Basel, Switzerland

Baseline and LS mean change from baseline vs placebo across the different endpoints

	Baseline		Week 1		Week 4		Week 12	
	Elinzanetant 120 mg	Placebo-elinzanetant 120 mg	LS mean change vs placebo (95% CI)	Exploratory one-sided p value	LS mean change vs placebo (95% CI)	Exploratory one-sided p value	LS mean change vs placebo (95% CI)	Exploratory one-sided p value
Daily VMS frequency	14.02 (9.12)	15.22 (12.63)	-2.03 (-2.75, -1.31)	p<0.0001	-3.11 (-4.06, -2.16)	p<0.0001	-3.19 (-4.26, -2.13)	p<0.0001
Daily VMS severity	2.54 (0.23)	2.53 (0.24)			-0.27 (-0.36, -0.19)	p<0.0001	-0.34 (-0.45, -0.24)	p<0.0001
PROMIS SD SF 8b total T-score	61.4 (7.0)	60.5 (7.2)					-4.94 (-6.02, -3.85)	p<0.0001
MENQOL total score	4.52 (1.20)	4.49 (1.24)					-0.36 (-0.52, -0.20)	p<0.0001

CI, confidence interval; LS, least squares; SD standard deviation

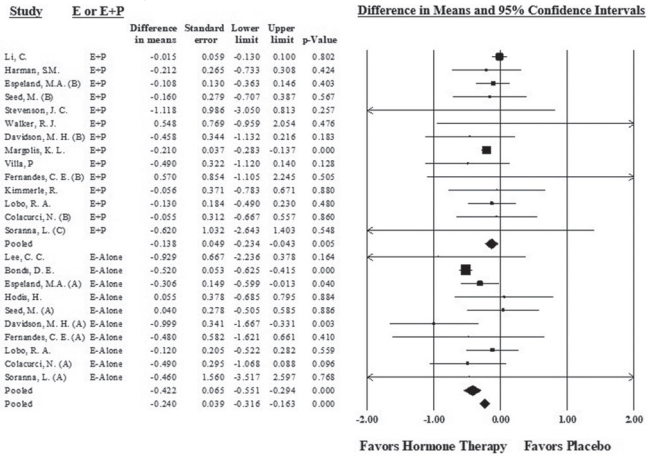
S-4.

Effect of hormone therapy on insulin resistance in healthy postmenopausal women: A systematic review and meta-analysis of randomized placebo-controlled trials

Tanya Li, BS[2,1], Julia Kaskey[1], Matthew Nudy, MD[3], Peter Schnatz[1,2], Xuezhi Jiang, MD, PhD[1,2]. [1]OBGYN, Reading hospital Tower Health, West Reading, PA; [2]OBGYN, Drexel university college of medicine, Philadelphia, PA; [3]Cardiology, The Penn State College of Medicine, Hershey, PA

Objective: Menopause is associated with an increased risk of developing insulin resistance and subsequently an increased risk of cardiometabolic diseases. The aim of this study is to summarize the effects of hormone therapy (HT) on insulin resistance in healthy postmenopausal women. **Design:** Comprehensive searches of PubMed, MEDLINE, EMBASE, the Cochrane Library, and Google Scholar were performed. We included randomized controlled trials (RCTs) published in English from 1998 to 2024 that evaluated the effect of HT on insulin resistance, measured by homeostasis model assessment of insulin resistance (HOMA-IR), in postmenopausal women without diabetes, hypertension, or cardiovascular diseases. Raw mean differences (RMDs) with 95% CIs were calculated using a random-effects model in Comprehensive Meta Analysis Version 4. Subgroup analysis evaluated the effects of estrogen alone (E) and estrogen plus progestogen (E+P) separately compared to placebo. Heterogeneity was assessed with I^2 values. **Results:** In total, 17 non-duplicate RCTs reporting fasting insulin, fasting glucose, or HOMA-IR values were included in the analyses. Of the total 29,287 postmenopausal women, 15,350 were randomized to HT including E alone (n=5,553) or E+P (n=9,797), and 13,937 were randomized to placebo. The mean age of the study population ranged from 47 to 75 years. Treatment duration ranged from 8 weeks to 2 years. Types and dosages of HT included oral conjugated equine estrogens (0.3 mg/day, 0.45 mg/day, 0.625 mg/day), oral 17β-estradiol (1 mg/day, 2 mg/day), transdermal 17β-estradiol (0.05 mg/day), cyclic or continuous use of oral medroxyprogesterone acetate (1.5 mg/day, 2.5 mg/day, 10 mg/day), micronized progesterone (200 mg/day), dydrogesterone (5 mg/day, 10 mg/day), norethisterone acetate (0.5 mg/day, 1 mg/day), drospirenone (2 mg/day), and norethisterone acetate (0.125 mg/day, 0.25 mg/day, 0.5 mg/day, 1 mg/day). Pooled results of 17 trials (3 for E alone, 7 for E+P, 7 for both E and E+P) indicated that HOMA-IR was significantly reduced in the HT group (overall effect: RMD [95% CI] = -0.24 [-0.36 to -0.12], $p < .001$, $I^2 = 60.3\%$) compared to the placebo group at the end of the intervention. In subgroup analysis, HOMA-IR was significantly reduced in both the E alone group (RMD [95% CI] = -0.42 [-0.55 to -0.29], $p < .001$) and the E+P group (RMD [95% CI] = -0.14 [-0.23 to -0.04], p = .005) compared to placebo (Fig.1). **Conclusion:** HT significantly reduced insulin resistance in healthy postmenopausal women. Estrogen alone was associated with a more prominent reduction in insulin resistance compared to combination HT.

Sources of Funding: None



S-5.

Benefits of Estetrol (E4) on Patient-Reported Outcome Measures in Postmenopausal Women: Results from a Phase 3 Trial

Ekta Kapoor[1], Melanie Taziaux[2], Amanda Black[3], Ulysse Gaspard[4], Rogerio A. Lobo[5], Wulf Utian[6], Jean-Michel Foidart, MD, PhD[4,2]. [1]Mayo Clinic, Rochester, MN; [2]Estetra SRL, an affiliate company of Mithra Pharmaceuticals, Liege, Belgium; [3]University of Ottawa, Ottawa, ON, Canada; [4]University of Liege, Liege, Belgium; [5]Columbia University Irving Medical Center, New York City, NY; [6]Case Western Reserve University School of Medicine, Cleveland, OH

Objective: Estetrol (E4), a tissue-selective estrogen, is being developed for treatment of vasomotor symptoms (VMS) in postmenopausal (PM) women. Phase 2 and 3 trials have demonstrated the efficacy and general safety of E4 in PM women. E4 has limited impact on hemostasis parameters and breast tissue, with potential benefits on lipids, glucose metabolism, and bone turnover. E4 is not metabolized by cytochrome P450 enzymes and thus is expected to have no clinically relevant drug interactions, a strongly desirable characteristic for PM women who have higher rates of comorbidities and polypharmacy. Here, we present patient-reported outcomes with E4 from a Phase 3 trial (E4Comfort II) conducted in North America. **Design:** E4Comfort II was a placebo-controlled, double-blind,

multicenter, randomized study, evaluating the efficacy and safety of E4 for moderate to severe VMS in PM women aged 40-65 years (NCT04090957). Participants (n=579) were randomized to E4 15 mg (n=192), E4 20 mg (n=193), or placebo (n=194) once daily for 12 weeks. Patient-reported outcomes was a secondary efficacy endpoint and was assessed using validated questionnaires: Menopause-Specific Quality of Life (MENQOL) and Clinical Global Impression (CGI). MENQOL, consisting of 29 items in 4 domains (vasomotor, psychosocial, physical, and sexual) and rated on a 0-6 scale, was completed at baseline and weeks 12 and 52 (W12 and W52, respectively). The CGI questionnaire, which evaluates the global rating of symptom severity, improvement, and response to treatment, was completed at week 4 (W4) and W12. Participants rating their VMS symptoms as "much improved" or "very much improved" were considered to have a clinically important difference (CID) in their symptoms. Statistical analyses were performed using the mixed-effects model for repeated measures for MENQOL, and the Chi square test for CGI. **Results:** The MENQOL total score as well as the score reported for the 4 individual domains improved from baseline at W12 and W52 in participants on both doses of E4. At W52, the MENQOL total score showed a statistically significant improvement from baseline in those on the 15 mg dose compared to those on placebo (LS mean difference [95% CI] compared to placebo of -0.43 [-0.79, -0.06]; p=0.0176). There was also a significant improvement in the vasomotor domain scores in those on E4 compared to those on placebo: (-0.76 [-1.35, -0.17]; p=0.0085) for the 15 mg dose at W52; and (-0.78 [-1.27, -0.28]; p=0.0011) for the 20 mg dose at W12 and (-0.75 [-1.35, -0.14]; p=0.0127) for the 20 mg dose at W52. A significantly larger proportion of the women treated with E4 20 mg demonstrated CID within the first weeks of treatment, compared with placebo (52.6% at W4, p=0.0017; 71.3% at W12, p=0.0012). In the E4 15 mg group 37.6% of participants reached CID at W4 (p=0.7283) and 63.5% at W12 (p=0.0629). **Conclusion:** E4-treated postmenopausal women reported a general improvement in their health-related quality of life, with s significant differences compared to placebo observed for the total MENQOL score and the vasomotor domain score. Additionally, most women treated with E4 20mg reported clinically important improvement of their symptoms, compared to those treated with placebo.

Sources of Funding: The study was funded by Estetra SRL, an affiliate company of Mithra Pharmaceuticals, Liège, Belgium.

S-6.

Bone Turnover in Postmenopausal Women: Evaluating the Impact of Estetrol (E4) from a Randomized Placebo-Controlled Phase 3 Tria

Amanda Black[1], Melanie Taziaux[2], Ulysse Gaspard[3], Ekta Kapoor[4], Rogerio A. Lobo[5], Wulf Utian[6], Jean-Michel Foidart, MD, PhD[3,2]. [1]University of Ottawa, Ottawa, ON, Canada; [2]Estetra SRL, an affiliate company of Mithra Pharmaceuticals, Liege, Belgium; [3]University of Liege, Liege, Belgium; [4]Mayo Clinic, Rochester, MN; [5]Columbia University Irving Medical Center, New York, NY; [6]Case Western Reserve University School of Medicine, Cleveland, OH

Objective: Estetrol (E4) is a natural estrogen, with efficacy in reducing frequency and severity of menopausal vasomotor symptoms (VMS), with limited impact on hemostasis and a potential benefit on metabolic parameters. Estrogen hormone therapy is an important treatment option for menopausal women suffering from VMS with the added benefit of neutralizing the accelerated bone turnover associated with menopause. Type I Collagen Cross-linked C-Telopeptides (CTX-1) and Procollagen 1 N-Terminal Propeptide [P1NP]) are biomarkers of bone turnover, while calcium and 25-Hydroxyvitamin D (vitamin D) are involved in bone mineral metabolism of bone. A previous Phase 2 study demonstrated the reduction of bone turnover biomarkers values after E4 treatment, suggesting beneficial effects of E4 on bone turnover. Here we present Phase 3 study results on bone turnover markers after 12 and 52 weeks of E4 treatment in postmenopausal (PM) women. **Design:** A placebo-controlled, double-blind, multicenter, randomized study (E4Comfort II, NCT04090957) was conducted in 122 sites in the US and Canada to evaluate the efficacy and safety of E4 for the treatment of moderate to severe VMS in PM hysterectomized and non-hysterectomized women aged 40-65 years. 579 PM women were randomized to receive either E4 15 mg (n=192), E4 20 mg (n=193), or placebo (n=194) once daily for 52 weeks. Blood samples were collected at baseline (visit 1), week 12 (W12) and week 52 (W52) and analyzed for bone turnover biomarkers (CTX-1, P1NP), calcium, and vitamin D. Statistical analyses on changes from baseline (CFB) compared to placebo were performed using the Mixed Model Repeated Measures with $p<0.05$ considered significant. **Results:** Results are displayed in Table 1. The mean level of CTX-1 decreased significantly in both E4 treatment groups compared to placebo at W12 (all $p<0.0001$) and at W52 (all $p<0.0001$). The decreases in mean levels of P1NP were statistically significant compared to placebo for both 15 mg and 20 mg doses of E4 at W12 ($p=0.0220$ and $p<0.0001$, respectively) and at W52 (all $p<0.0001$). Compared to placebo, calcium decreased significantly in E4 groups at W12 (E4 15 mg, $p=0.0004$ and E4 20 mg, $p<0.0001$) and at W52 for E4 20 mg ($p<0.0001$). There were no significant differences on vitamin D levels between E4 treatment compared to placebo. **Conclusion:** E4 treatment is associated with a reduction of the biomarkers CTX-1 and PINP which is indicative of reduced bone turnover. E4 has a potentially beneficial effect on maintenance of bone strength and therefore, prevention of osteoporosis in postmenopausal women.

Sources of Funding: The study was funded by Estetra SRL, an affiliate company of Mithra Pharmaceuticals, Liège, Belgium.

Table 1. Change from Baseline to Week 12 and Week 52 for Bone Turnover Biomarkers

Timepoint	E4 15 mg (N = 192)		E4 20 mg (N = 193)		Placebo (N = 194)
	LS mean CFB (95% CI)	p-value (vs placebo)	LS mean CFB (95% CI)	p-value (vs placebo)	LS mean CFB (95% CI)
CTX-1 (µg/L)					
W12	-0.15 (-0.18, -0.12)	<.0001	-0.15 (-0.19, -0.12)	<.0001	-0.02 (-0.05, 0.01)
W52	-0.19 (-0.22, -0.15)	<.0001	-0.16 (-0.20, -0.12)	<.0001	-0.02 (-0.05, 0.02)
PINP (µg/L)					
W12	-8.45 (-11.99, -4.91)	0.0220	-13.84 (-17.40, -10.27)	<.0001	-2.22 (-5.71, 1.26)
W52	-16.08 (-20.57, -11.59)	<.0001	-13.83 (-18.63, -9.03)	<.0001	-0.15 (-4.34, 4.04)
Calcium (mmol/L)					
W12	-0.04 (-0.06, -0.03)	0.0004	-0.08 (-0.09, -0.06)	<.0001	0.00 (-0.02, 0.02)
W52	-0.07 (-0.09, -0.04)	0.0898	-0.11 (-0.13, -0.08)	<.0001	-0.04 (-0.06, -0.02)
Vitamin D (nmol/L)					
W12	2.37 (-1.92, 6.66)	0.7531	-2.19 (-6.46, 2.07)	0.5548	0.51 (-3.66, 4.67)
W52	13.89 (8.44, 19.33)	0.1170	5.52 (-0.29, 11.34)	0.8850	7.07 (1.97, 12.17)

LS: Least Squares

THURSDAY CONCURRENT SESSION #2

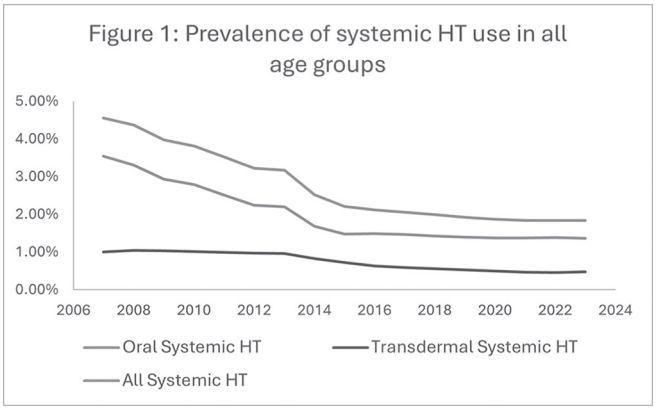
S-7.

Menopausal Hormone Therapy Utilization (2007-2023) Remains Stagnant in the United States

Mariam Saadedine[1,3], Mary S. Hedges, MD[2], Chrisandra Shufelt[1,3], Ekta Kapoor[3,4], Juliana M. Kling, MD, MPH, NCMP, FACP[5,3], Megan R. Handley, PharmD, R.Ph[6], Nancy Safwan, MD[1,3], Viengneesee Thao, PhD[7], Stacey J. Winham, PhD[8], Kristin Cole[8], Stephanie Faubion[3,1]. [1]General Internal Medicine, Mayo Clinic, Jacksonville, FL; [2]Community Internal Medicine, Mayo Clinic, Jacksonville, FL; [3]Mayo Clinic Women's Health, Rochester, MN; [4]Women's Health Research Center, Mayo Clinic, Rochester, MN; [5]Internal Medicine, Mayo Clinic, Scottsdale, AZ; [6]Phoenix Outpatient Clinic, Mayo Clinic, Phoenix, AZ; [7]Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, MN; [8]Quantitative Health Sciences, Mayo Clinic, Rochester, MN

Objective: To describe systemic menopausal hormone therapy (HT) utilization in women aged 40 and older between 2007 and 2023. **Design:** Claims data from the OptumLabs data warehouse was analyzed for medical and pharmacy claims for commercially insured and Medicare Advantage enrollees from 2007 through 2023. Data included longitudinal health information for over 200 million enrollees, representing diverse age groups and geographical regions across the US. Women aged 40 or older with continuous medical and pharmacy coverage for each year were included. The annual rate of HT utilization was defined as the proportion of women in a year who had at least 180 days of a filled prescription for systemic estrogen-containing menopausal HT. The prevalence of HT use was evaluated across age groups (40-44; 45-49; 50-54; 55-59; 60-64; 65-69; and 70+ yrs). Systemic HT was further categorized into oral versus transdermal estrogen. **Results:** The study population of women grew from ~2 million in 2007 to 4.5 million in 2023. HT use in women aged 40 or older was 4.6% in 2007, then decreased to 2.5% between 2007 and 2014 and continued to decline to 1.8% in 2023. Oral HT was the most common route of administration (Figure). Among women aged 45-49, 50-54, and 55-59 (within 10 years of the mean age of menopause), HT use decreased from 3.2%, 6%, and 7.3% in 2007 to 1.5%, 3.6%, and 3.8% in 2023, respectively. **Conclusion:** Despite substantial evidence and guidelines supporting the efficacy and safety of menopausal HT, usage rates have declined and remain low, especially in age groups where there is a high prevalence of bothersome menopause symptoms. Future studies should explore barriers to prescribing and using HT including clinician and patient concerns to facilitate targeted awareness and education.

Sources of Funding: None



S-8.

Exploring Menopausal Care Delivery: The Intersection of Insurance, Race, and Hormone Therapy Use

Arina Chesnokova[1], Sunni Mumford[1], Makeba Williams[2], Allison Schachter[1], Erika Harness[3], Neila Kalipersad[1], Marilyn Schapira[1]. [1]University of Pennsylvania, Philadelphia, PA; [2]Washington University, St Louis, MO; [3]Thomas Jefferson University, Philadelphia, PA

Objective: A "care delivery vacuum" exists among biologic females undergoing the menopausal transition, yet causes and solutions remain elusive. Vasomotor symptoms (VMS) effect up to 80% of menopausal individuals with hormone replacement therapy (HRT) treatment received by only 4-6%, despite its safety and effectiveness. This care gap is even greater among racial and ethnic minorities. Black or African American persons report higher incidence and severity of VMS but receive less HRT treatment. The goals of this study are to 1) examine the association between insurance status and HRT usage; 2) understand the role of insurance coverage the observed disparities in HRT treatment between Black and White women. **Design:** We analyzed 2013-2020 National Health and Nutrition Examination Survey (NHANES) data (pooled, annualized). Our cohort included females aged 45-64 covered by either Medicaid or private insurance, excluding those with missing data, medical conditions contraindicating HRT, pregnant at time of survey, reporting premature ovarian failure or iatrogenic menopause prior to age 45. The primary outcome was the history or current use of HRT, with Medicaid versus private insurance as the primary predictor. A secondary analysis explored the role of insurance status in the disparity of HRT use among Non-Hispanic Black and White individuals. Confounding variables were abstracted from NHANES. Weighted Chi2 and t-test statistics were used for bivariate comparisons; weighted multivariable logistic regression for adjusted analyses (Stata 17.0). **Results:** Our final weighted cohort represented 24,034,757 people (1,778 respondents). In unadjusted analyses, factors like being older, Non-Hispanic White, better educated, US-born, having private insurance, a healthier diet, and frequent physician visits correlated with HRT use. In adjusted analyses (with interaction between insurance and race and ethnicity, educational achievement, nativity, cardiovascular disease risk factors, BMI, healthy diet, heavy alcohol use, and number of visits to a physician in the past year), individuals insured by Medicaid were 57% less likely (OR 0.43, 95% CI 0.23-0.79) to report having used HRT. When sequentially assessing the association between race, insurance status and HRT use in a sub-cohort of Non-Hispanic Black and Non-Hispanic White individuals, in a model with just race, NH Black were 34% less likely to report HRT use, however that association became insignificant with addition of insurance status and further adjustment for covariates (see Table). **Conclusion:** This study reveals that insurance status, especially Medicaid vs. private, critically influences HRT usage among eligible women during menopause. Notably, the lower treatment rates among Black or African American menopausal individuals in this analysis can be attributed to differences in insurance status. Future research should delve into the specific aspects of Medicaid, such as access, care quality, and formulary restrictions, to understand their impact of Medicaid program design on menopausal care delivery.

Sources of Funding: None

The association between race, payor status, and history of HRT use. Analytic sample limited to Non-Hispanic Black and Non-Hispanic White respondents. Pooled annualized NHANES 2013-2020, weighted n=19,923,129

Outcome: history of HRT use	Model 1 - Race as only predictor	Model 2 - Race, insurance as predictors	Model 3 - Race, insurance as predictors, controlled for confounders
	OR (95%CI)	OR (95% CI)	OR (95% CI)
Race & ethnicity			
NH White	[ref]	[ref]	[ref]
NH Black	0.66 (0.45, 0.97)*	0.73 (0.50, 1.1)	0.90 (0.57, 1.41)
Insurance coverage			
Private Insurance		[ref]	[ref]
Medicaid		0.51 (0.34, 0.77)**	0.44 (0.27, 0.73)**
Demographic & clinical characteristics[a]			[not shown]

(a) Model 3 was adjusted for the following demographic and clinical characteristics: educational level, nativity, cardiovascular disease risk factors, BMI, diet, alcohol use, and number of physician visits in the past year

*** significant at <0.05**

**** significant at <0.005**

S-9.

The Long-term Effect of Hormone Therapy on Cardiovascular Biomarkers in the Women's Health Initiative Hormone Therapy Clinical Trials

Matthew Nudy, MD[1], Aaron Aragaki[2], Xuezhi Jiang, MD, PhD[3], JoAnn Manson[4], Aladdin Shadyab, PhD[5], Su Yon Jung[6], Lisa W. Martin, MD[7], Robert A. Wild[8], Catherine Womack[9], Charles P. Mouton, MD, MS, MBA[10], Jacques Rossouw[11], Peter Schnatz[3]. [1]Penn State Hershey Medical Center, Hershey, PA; [2]Fred Hutchinson Cancer Institute, Seattle, WA; [3]Reading Hospital/Tower Health, Reading, PA; [4]Brigham and Women's Hospital, Boston, MA; [5]University of California San Diego, San Diego, CA; [6]University of California Los Angeles, Los Angeles, CA; [7]George Washington University, Washington, DC; [8]Oklahoma University Health Science Center, Oklahoma City, OK; [9]University of Tennessee Health Science Center, Memphis, TN; [10]University of Texas Medical Branch, Galveston, TX; [11]National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, MD

Objective: To assess the longer-term effect of both conjugated equine estrogens (CEE) alone and CEE plus medroxyprogesterone acetate (MPA) on various cardiovascular biomarkers in the Women's Health Initiative (WHI) hormone therapy (HT) clinical trials. **Design:** A protocol-specified 8.6% stratified random sample of HT trial participants from both the CEE alone trial (n=1,188, 0.625 mg/day of CEE or placebo) and CEE plus MPA trial (n=1,508, 0.625 mg/day of CEE plus continuous 2.5 mg/day of MPA or placebo) were included in this study and provided a blood sample at baseline and years 1, 3, and 6. Low density lipoprotein-cholesterol (LDL-C; primary endpoint), high density lipoprotein-cholesterol (HDL-C), triglycerides, total cholesterol, lipoprotein(a) (Lp(a)), glucose, insulin, and homeostatic model assessment for insulin resistance (HOMA-IR) were measured. Repeated-measures regression models estimated geometric mean concentrations of each log-transformed biomarker by restricted maximum likelihood. A constant treatment effect across visits was used to estimate the overall effect, and this result was complemented with geometric means (95%CI) by randomization group, and corresponding ratios of geometric means (rGM, 95%CI; HT vs. placebo) at each visit. A multivariate analysis was conducted to directly compare the two HT trials' effect on biomarkers by estimating the ratio of the mean ratios during the first 3 years of intervention, as median follow-up was shorter in the CEE+MPA trial. **Results:** One year after randomization to CEE, there was an 11% reduction in LDL-C compared to placebo, rGM (95%CI) = 0.89 (0.86-0.91). The effect was mostly persistent at years-3 and 6 (P-value for heterogeneity = 0.09), with rGM (95%CI) = 0.89 (0.87-0.92) and rGM (95%CI) = 0.93 (0.89-0.96), respectively. Overall, there was an 11% reduction in LDL-C during the intervention phase of the CEE alone trial; rGM (95%CI) = 0.89 (0.88-0.91), P < 0.001. The overall reduction in LDL-C was similar for CEE plus MPA, relative to placebo; rGM (95%CI) = 0.88 (0.86-0.89), P < 0.001. However, the influence of CEE plus MPA on LDL-C diminished during follow-up (P-het < 0.001), with rGM increasing from rGM (95%CI) = 0.87 (0.86-0.89) at year-1 to rGM (95%CI) = 0.95 (0.91-0.99) by year-6. Both CEE-alone and CEE plus MPA had a favorable influence on all cardiovascular biomarkers, except for triglycerides. Relative to placebo, HDL-C increased by 13% and 7% for participants randomized to CEE-alone and CEE plus MPA, respectively. Similar increases of 13% and 7% were observed for triglycerides in each trial. HOMA-IR decreased by 14% and 8% for CEE-alone and CEE plus MPA**,** respectively. Relative to placebo, Lp(a) decreased by 15% and 20% for participants randomized to CEE-alone and CEE plus MPA, respectively. When directly comparing the two HT trials, there was a highly significant difference between trials (p-diff < 0.001), largely due to the more favorable influence CEE-alone had on HDL-C compared to CEE plus MPA; there was no difference between CEE-alone and CEE plus MPA's influence on LDL-C. **Conclusion:** Both CEE alone and CEE plus MPA had favorable long-term effects on all cardiovascular biomarkers except triglycerides. CEE had a more favorable effect on HDL-C compared to CEE plus MPA, but no significant difference on LDL-C between CEE and CEE plus MPA was observed. Future research should assess whether other progestogen formulations may be less likely to attenuate estrogen's long-term effect on HDL-C.

Sources of Funding: National Heart, Lung, and Blood Institute

S-10.

Decubitus Ulcer Prevention by Hormone Therapy

Alberto Dominguez-Bali[2], Sarah Mourtada[1], Yanicka Shepherd[1], Monica Pevida, medical student[1]. [1]OBGYN, American University of Antigua College of Medicine, Miami, FL; [2]Miami Center of Obsterics and Gynecology, Miami, FL

Objective: Objective: Despite the widespread discontinuation of hormone therapy (HT) in geriatric and centenarian women due to misinformation following the Women's Health Initiative (WHI) publication, a few continue to use HT systemically and locally. We observed that these patients, despite prolonged prostration, do not develop decubitus ulcers. This study aims to report our findings on the relationship between hormone replacement therapy and decubitus ulcer prevention in elderly women under our care in homecare facilities. **Design:** Design: We conducted a retrospective analysis of patients receiving hormone replacement therapy in homecare settings to assess the incidence of decubitus ulcers. Emphasis was placed on the vasodilatory effects of hormone therapy in preventing hypoxia, ischemia, and necrosis in integumentary tissues subjected to physical pressure. Our observations are novel and not described in current medical literature. **Results:** Results: Patients who maintained hormone therapy, whether systemic or local, exhibited a reduced incidence of decubitus ulcers despite prolonged prostration. The vasodilatory effect of hormone therapy appears to play a critical role in preventing tissue hypoxia and ischemia under physical pressure. **Conclusion:** Conclusion: Hormone therapy's vasodilatory effect represents a significant yet underrecognized benefit in

preventing decubitus ulcers in elderly women. Despite the controversies surrounding HT use, our findings underscore the importance of considering hormone therapy in comprehensive care strategies for geriatric patients, particularly in preventing adverse outcomes associated with immobility and this is more evidence that supports the use of hormone therapy up until mortality

Sources of Funding: None

S-11.

A phase I, single arm, prospective study to evaluate the treatment of genitourinary syndrome of menopause (GSM) with platelet rich plasma (PRP) in women with a history of breast cancer.

Anita H. Chen, MD[1], Johnny Yi, MD[2], Saranya Chumsri, MD[3], Jacqueline M. Thielen, MD[4], Jeffrey L. Cornella, MD[2], Shane A. Shapiro, MD[5], Reagan E. Dukes, MHA[6], Jennifer R. Arthurs, APRN[6], Michael Heckman, MS[6], Sophia G. Blumenfeld[6], Emanuel C. Trabuco, MD[7]. [1]Medical and Surgical Gynecology, Mayo Clinic Florida, Jacksonville, FL; [2]Medical and Surgical Gynecology, Mayo Clinic Arizona, Phoenix, AZ; [3]Medical Oncology, Mayo Clinic Florida, Jacksonville, FL; [4]General Internal Medicine, Mayo Clinic Florida, Jacksonville, FL; [5]Orthopedic Surgery, Mayo Clinic Florida, Jacksonville, FL; [6]Research, Mayo Clinic Florida, Jacksonville, FL; [7]Obstetrics and Gynecology, Mayo Clinic Rochester, Rochester, MN

Objective: To assess safety and feasibility of injection of autologous PRP to the vaginal canal and evaluate 6-month efficacy for treatment of GSM in breast cancer survivors. **Design:** Breast cancer survivors (stage 0-III) who reported vaginal dryness with or without dyspareunia were invited to enroll. Participants underwent a single treatment of autologous PRP injected throughout the vaginal canal and posterior fourchette. The primary outcome was to assess safety and feasibility of the treatment. Adverse events (AE), PRP gram stain and culture, and injection pain scores with a 10 point visual analog scale (VAS) were recorded. Secondary outcomes included evaluation of vaginal atrophy with vaginal maturation index (VMI) and vaginal health index (VHI), vaginal and vulvar symptoms with assessment scales (VAS/VuAS), quality of life with the day-to-day impact of vaginal aging questionnaire (DIVA), sexual function with the female sexual function index (FSFI), and urinary symptoms with the urogenital distress index (UDI-6). Vaginal caliber was measured using a standard vaginal dilator set. VMI was obtained at baseline and 6 months. All other measures were obtained at baseline, 1, 3, and 6 months. Patient global impression of improvement (PGI-I) was assesed with a 7 point Likert scale. **Results:** Twenty participants were enrolled; mean age 53 years (range 40-66) and body mass index of 27.2 kg/m^2 (range 20-36.6). All completed the planned injection protocol with a mean VAS pain score of 3.9 (range1-7). All PRP preparation was sterile. AE from treatment were mild and included vaginal spotting, burning, cramping, irritation, discharge, and pain (treated with acetaminophen/ibuprofen) which resolved within 24 hours. No systemic allergic reactions or injection related issues occurred. FSFI, UDI-6, DIVA, VHI, and VAS/VuAS total scores showed significant improvement when comparing baseline to 6 months while VMI change was non-significant. 90% of patients had an increase in vaginal caliber (35% increase by 1, 40% increase by 2, 15% increase by 3) as measured by change in dilator size. On PGI-I, 95% noted improvement of symptoms (20% “a little better”, 50% “much better”, 25% “very much better”). See Table 1 for 6-month outcome summary. **Conclusion:** Injection of autologous PRP to the vaginal canal and posterior fourchette is safe and feasible. Treatment significantly improved GSM symptoms, sexual function, urinary symptoms, and quality of life in breast cancer survivors. Phase 2 controlled studies are warranted to corroborate these findings.

Sources of Funding: Mayo Clinic Center for Regenerative Biotherapeutics

Table 1 Comparisons of outcomes between baseline and 6 months

Variable	N	Baseline Mean (SD) or No.(%) of patients	N	6 month Mean (SD) or No.(%) of patients	N	6 month minus Baseline Mean (95%CI)	P-value
FSFI	20	11.88 (6.84)	20	20.60 (8.39)	20	8.72 (5.45,11.99)	<0.001*
UDI- 6	20	17.22(15.90)	20	10.83(13.42)	20	-6.39 (-10.00,-2.78)	0.001*
DIVA	20	1.81 (0.50)	20	0.90 (0.69)	20	-0.92 (-1.33,-0.50)	<0.001*
VAS/VuAS total	20	12.90(5.48)	20	4.75(3.67)	20	-8.15 (-10.37,-5.93)	<0.001*
VHI	20	9.95 (1.90)	20	20.55 (1.70)	20	10.60(9.66,11.54)	<0.001*
VMI	16	23.18(20.56)	16	23.08(15.48)	16	-0.10(-10.40,10.20)	0.98

P-values vs baseline result from a paired t-test. *Statistically significant at P ≤ 0.05

S-12.

Analysis of Responders in the Phase 3b DAYLIGHT Study: Treatment of Moderate-to-Severe Vasomotor Symptoms due to Menopause in Women Considered Unsuitable for Hormone Therapy

Marla Shapiro C.M.[1], Katrin Schaudig[2], Angelica L. Hirschberg[3], Martin Blogg[4], Antonia Morga[4], Karla Martins[4], Céline Bouchard[5]. [1]University of Toronto, Toronto, ON, Canada; [2]Hormone Hamburg, Hamburg, Germany; [3]Inselspital, Bern, Switzerland; [4]Astellas Pharma Europe Ltd, Addlestone, United Kingdom; [5]Clinique de Recherche en Santé de la Femme, Quebec City, QC, Canada

Objective: To characterize the efficacy of fezolinetant by assessing responders of percent reduction ≥50%, ≥75%, and at 100% in frequency of moderate-to-severe vasomotor symptoms (VMS) due to menopause in the 24-week placebo-controlled DAYLIGHT study. **Design:** Fezolinetant is an oral, nonhormonal, neurokinin 3 receptor antagonist treatment option for moderate-to-severe VMS due to menopause, and is approved in the US, Europe, and Australia at a dose of 45 mg once daily. DAYLIGHT (NCT05033886) was a phase 3b, randomized, double-blind, 24-week placebo-controlled study of fezolinetant in women considered unsuitable for hormone therapy (HT). Participants were women aged ≥40 to ≤65 years with moderate-to-severe VMS randomized 1:1 to placebo or fezolinetant 45 mg once daily. Unsuitability for HT was categorized by contraindications, caution (prior medical history), stoppers (lack of efficacy, side effects, or medical advice), or averse (made informed choice not to take HT after discussion with clinician). The primary endpoint was mean change in daily VMS frequency of moderate-to-severe episodes from baseline to Week 24. Secondary endpoints included responders of percent reduction ≥50%, ≥75% and at 100% in the frequency of moderate-to-severe VMS from baseline. Responders were analyzed with a logistic regression for each of the responders at each week through the 24-week study. **Results:** Overall, 453 women were enrolled (placebo n=226; fezolinetant n=227), including HT contraindicated (51, 11%), caution (165, 36%), stoppers (69, 15%), and averse (168, 37%). DAYLIGHT results met the primary endpoint showing statistically significant reduction from baseline in the frequency of moderate-to-severe VMS to week 24 for fezolinetant 45 mg once daily versus placebo. Through week 24, no new safety signals of concern were identified for 45 mg fezolinetant dose, and the safety profile is consistent with SKYLIGHT trials. The proportion of participants with ≥50%, ≥75%, and 100% reductions in the frequency of moderate-to-severe VMS was higher in the fezolinetant 45 mg group than placebo group at all visits during the treatment period (except week 1, which had no responders with 100% reduction), and each of these differences were statistically significant. The proportion of participants who had a ≥50% reduction in the fezolinetant group increased from week 1 (42.0% vs. 14.6% fezolinetant vs. placebo, respectively, p<0.001) to week 8 (65.9% vs 51.8%, p=0.003), and this proportion was maintained through week 24 (60.6% vs. 46.0%, p=0.002). The proportion of participants who had a ≥75% reduction in the fezolinetant group increased from week 1 (15.5% vs. 2.2% fezolinetant vs. placebo, respectively, p<0.001) to week 8 (46.0% vs. 30.5%, p<0.001), and this proportion was maintained through week 24 (46.9% vs. 29.6%, p<0.001). The proportion of participants who had 100% reduction in the fezolinetant group increased from week 1 with no responders in either treatment group to week 8 (15.5% vs. 7.5% fezolinetant vs. placebo, respectively, p=0.009), and this proportion was maintained through week 24 (22.1% vs. 10.6%, p=0.001). **Conclusion:** DAYLIGHT is the first study of fezolinetant to investigate efficacy versus placebo over 24 weeks. Fezolinetant 45 mg was efficacious and well tolerated for moderate-to-severe VMS associated with menopause in women considered unsuitable for HT. Analysis of responders of percent reduction ≥50%, ≥75%, and at 100% in VMS frequency showed significantly higher responder rates and support the treatment effect of fezolinetant relative to placebo in women unsuitable for HT.

Sources of Funding: This study was funded by Astellas Pharma Inc.

TOP-SCORING ABSTRACT PRESENTATIONS

S-13.

Relationship between fezolinetant-driven improvements in vasomotor symptoms and mood in patients with menopause: analysis of the SKYLIGHT trials

Nanette Santoro, MD[1], Martin Blogg[2], Antonia Morga[2], Karla Martins[2], Genevieve Neal-Perry, MD[3]. [1]University of Colorado Anschutz Medical Campus, Aurora, CO; [2]Astellas Pharma Europe Ltd., Addlestone, United Kingdom; [3]University of North Carolina School of Medicine, Chapel Hill, NC

Objective: Vasomotor symptoms (VMS) associated with menopause, characterized by hot flashes (HF) and/or night sweats, are present in up to 80% of women experiencing menopause, and may interfere with sleep, mood, and concentration. SKYLIGHT 1 (NCT04003155) and SKYLIGHT 2 (NCT04003142) assessed the efficacy of fezolinetant, an oral neurokinin 3 receptor (NK3R) antagonist, in treating moderate-to-severe VMS associated with menopause. Fezolinetant significantly reduced VMS and improved mood scores on the Menopause-Specific Quality of Life (MENQOL) questionnaire vs. placebo at weeks 12 and 52. However, the relationship between improvements in HF and improvements in mood is unclear. **Design:** Data were pooled from SKYLIGHT 1 and 2; two randomized, double-blind, multicenter, placebo-controlled phase 3 trials conducted in the United States, Canada, United Kingdom, and Europe. Participants (women aged 40-65 years experiencing 50-60 HF per week) were randomized 1:1:1 to receive oral fezolinetant 30 mg or 45 mg once daily, or placebo in a 12-week double-blind period. Completers entered a 40-week extension period; the fezolinetant group continued their initial dose and placebo group was re-randomized to fezolinetant 30 mg or 45 mg. Correlation between improvements in HF (frequency, severity, and frequency at night) and improvements in mood, as measured using the MENQOL psychosocial domain score, was assessed, with a correlation coefficient of 0 indicating no correlation and 1 indicating a very high positive correlation. **Results:** For participants receiving fezolinetant 30 mg (n=339) or fezolinetant 45 mg (n=341) there was a negligible correlation between improvements in HF (frequency, severity, and frequency at night) and improvements in MENQOL psychosocial domain score at both 12 and 52 weeks of fezolinetant treatment (Table). No correlation was statistically significant. **Conclusion:** These findings from SKYLIGHT do not support a meaningful relationship between improvements in the frequency or severity of HF and improvements in mood following up to 1 year of treatment with fezolinetant. While fezolinetant significantly reduced VMS and improved mood scores on the MENQOL questionnaire vs. placebo in SKYLIGHT 1 and 2, the current analysis suggests improvement in mood is not solely attributed to HF reduction and may provide novel information about the underlying neurobiology of menopause-related HF and mood changes.

Sources of Funding: This study was funded by Astellas Pharma Inc.

Relationship (correlation coefficients) between MENQOL psychosocial domain score and HF frequency and severity at 12 and 52 weeks of fezolinetant treatment

Relationship between MENQOL psychosocial domain score and ...	Fezolinetant 30 mg (n=339)		Fezolinetant 45 mg (n=341)	
	12 weeks[a]	52 weeks[b]	12 weeks[a]	52 weeks[b]
HF frequency	0.163	0.178	0.180	0.164
HF severity	0.249	0.263	0.204	0.181
HF frequency at night	0.176	0.187	0.166	0.148

[a]Change from baseline; 540 paired observations for fezolinetant 30 mg and 587 paired observations for fezolinetant 45 mg.
[b]Change from baseline; 880 paired observations for fezolinetant 30 mg and 943 paired observations for fezolinetant 45 mg.
Notes: Correlation coefficients based on a linear mixed effects model for repeated measures. An unstructured variance-covariance matrix was used to model between-participant and within-participant errors. Size of correlation: 0.00 to 0.30 indicates a negligible correlation.
HF, hot flashes; MENQOL, Menopause-Specific Quality of Life; mg, milligram; n, sample size.

S-14.

Uncovering Metabolic Changes in the Ovary during the Menopause Transition using System Network Approaches

Emma Lee[1], Madison Ferris[1], Natalia Pascuali[3], Almudena Veiga-Lopez[3], Beatriz Peñalver Bernabé[1,2]. [1]Department of Biomedical Engineering, University of Illinois Chicago, Chicago, IL; [2]Center for Bioinformatics & Quantitative Biology, University of Illinois, Chicago, IL; [3]Department of Pathology, University of Illinois Chicago, Chicago, IL

Objective: The menopause transition involves significant biological changes, notably the decrease in estrogen and progesterone. Despite the importance of these metabolic changes during ovarian aging, much remains unknown, preventing us from establishing biomarkers that can assist in determining the onset and length of the menopausal transition. Mathematical network-based approaches, such as Genome-scale Metabolic Models (GEMs), could aid in elucidating the metabolism of the ovary and the effect of aging. GEMs include all known biochemical reactions, gene, enzymes, and metabolites in a biological system and can be made individual specific, allowing for personalized diagnosis and treatments. Here, we aim to utilize a personalized network-based approach to elucidate metabolic changes in the ovary throughout the menopause period. **Design:** We utilized ovarian transcriptional data (bulk RNA-seq) from the GTEX (v8) data consortium, containing 180 ovarian tissues samples from patients aged 20-79. Based on histology notes and donor age range, we categorized samples as Pre-menopause transition (Pre-MT, < 40 years old), Menopause transition (MT, 41-59 years old) or Post-menopause transition (Post-MT, >60 years old). Differential expression analysis of genes that encode for enzymes was performed with EdgeR to uncover possible metabolic variations throughout ovarian aging. To identify the predicted active areas of ovarian metabolism at the individual level (personalized ovarian metabolism), we adopted a Systems Metabolic approach to construct sample specific GEMs. Models were made sample-specific by overlaying ovarian transcriptional data from GTEx to the latest human genome-wide metabolic reconstruction, Recon3D, using robust computational pipelines (COBRA), resulting in 180 personalized ovarian GEMs. As each individual-specific GEM is a metabolic network, we applied network analysis methods (graph theory) to determine significant network components (sample-specific hot spots) and metabolic communities (active pathways) between the Pre-MT networks and the Post-MT networks using PageRank values produced by Infomap. **Results:** Differential expression analysis identified significant enzyme-encoding genes that exhibit temporal changes: the endoplasmic reticulum enzyme carbonic anhydrase-4 (CA4) declined with age, whereas the lysosomal Mucolipin TRP Cation Channel 3 (MCOLN3) increased. This finding aligns with studies that have shown that the activity of lysosomal processes become more prominent as the ovary ages. Then, we developed individual-specific GEMs (180 metabolic networks) where metabolites are the nodes, and the edges are the reactions they partake in. By comparing the networks community structure and the strength of the connections between the metabolites using PageRank, we identified network components that differ between the Pre-MT GEMs and the Post-MT GEMs. Our models recovered well-known metabolic processes such as a decrease in androgen and estrogen metabolism in the Post-MT GEMs compared to the Pre-MT GEMs. Our metabolic networks also revealed underexplored processes during the menopause transition such as the positive association between eicosanoid metabolism and ovarian aging. Dysregulation of the eicosanoid metabolism has been documented in the context of gynecological malignancies, but not menopause. Our network approach revealed that the enzyme lipase A lysosomal acid type (LIPA) which catalyzes the hydrolysis of cholesteryl esters and triglycerides to render free cholesterol and fatty acids, is decreased in the Post-MT ovary networks compared to that of the Pre-MT. Similar trends were observed to the enzyme acetyl-CoA acyltransferase 1 (ACAA1) which is operative in beta-oxidation. **Conclusion:** Our network-based approaches provided powerful insights into the dynamic metabolic changes during the menopause transition. Metabolic markers discovered here could serve as novel biomarkers to establish the start and length of the menopause transition and may provide insights into personalized treatments.

Sources of Funding: None

S-15.

Hippocampal Functional Connections Support Verbal Learning in Midlife Postmenopausal Women

Katrina Wugalter, PhD[1], Rebecca Thurston, PhD[2], Minjie Wu, PhD[5], Howard Aizenstein[6], Carol Derby, PhD[3], Pauline Maki, PhD[4]. [1]Psychology, University of Illinois Chicago, Chicago, IL; [2]Psychiatry, Psychology, and Epidemiology, University of Pittsburgh, Pittsburgh, PA; [3]Neurology and Epidemiology & Population Health, Albert Einstein College of Medicine, Bronx, NY; [4]Psychiatry, Psychology, and Obstetrics & Gynecology, University of Illinois Chicago, Chicago, IL; [5]Psychiatry, University of Pittsburgh, Pittsburgh, PA; [6]Psychiatry, Bioengineering, and Clinical and Translational Science, University of Pittsburgh, Pittsburgh, PA

Objective: Verbal memory performance reliably declines across the menopause transition, as evidenced by large-scale longitudinal studies assessing verbal memory abilities on list- and story-learning tasks. However, the underlying neural circuitry that supports verbal learning in midlife postmenopausal women remains uncharacterized. This foundational knowledge is needed in the field of women's brain health to understand how age, hormonal changes and menopause symptoms may alter this neural circuitry to influence memory. Here we examined patterns of hippocampal functional connectivity associated with successful verbal learning in late midlife women. **Design:** Participants (N=174) were enrolled in MsBrain, a cohort study of brain health in late midlife postmenopausal women not taking hormone therapy. Participants completed functional magnetic resonance imaging (fMRI) assessments during a verbal encoding task. Generalized psychophysiological interaction analyses estimated hippocampal functional connectivity using SPM12 and Conn, with AlphaSIM (AFNI) to correct for multiple comparisons. Multiple linear regression was conducted to examine the associations between California Verbal Learning Test (CVLT) total learning scores and hippocampal (left [LHipp] and right [RHipp]) functional connectivity controlling for age, education, and race. **Results:** Participants in this analysis included 174 cognitively normal women (mean age = 59.3 years, 87.4% White, mean education = 15.7 years). Hippocampal functional connectivity to several regions was positively associated with CVLT total learning score. LHipp connectivity to the left fusiform gyrus, left medial frontal gyrus, and right fusiform gyrus was associated with higher learning scores (Table 1). CVLT total learning score was also positively associated with RHipp connectivity to the: left limbic lobe, medial frontal gyrus, superior frontal gyrus, and anterior cingulate gyrus; and right medial frontal gyrus and superior middle frontal gyrus (Table 2). **Conclusion:** Functional connections from the left and right hippocampi to areas primarily located within the left prefrontal cortex support verbal learning in midlife women. These findings provide a foundational knowledge of the neural patterns supporting verbal memory in the postmenopause that will facilitate future work exploring the effects of hormonal, biological, and affective factors on cognition that women experience during midlife.

Sources of Funding: This research was supported by the National Institutes of Health, National Institute on Aging (grant numbers: RF1AG053504 and R01AG053504 to R.C.T. and P.M.).

Table 1. Effect of left hippocampal connectivity on CVLT total learning score

Region	Estimate (SD)
Left fusiform	5.333 (1.599)**
Left medial frontal gyrus	4.175 (1.648)*
Right fusiform gyrus	7.184 (1.821)***

***p < .05, ** p<.01, ***p<.001**

Table 2. Effect of right hippocampal connectivity on CVLT total learning score

Region	Estimate (SD)
Left limbic lobe	2.968 (1.166)*
Left medial frontal gyrus	4.667 (1.349)***
Left superior frontal gyrus	4.424 (1.813)*
Left anterior cingulate gyrus	3.146 (1.262)*
Right medial frontal gyrus	4.730 (1.504)**
Right superior middle frontal gyrus	4.984 (2.166)*

***p < .05, ** p<.01, ***p<.001**

S-16.

Cognitive Behavioural Therapy for Sexual Concerns During Peri- and Post-Menopause (CBT-SC-Meno): A Clinical Trial

Sheryl M. Green[1,2], Melissa Furtado[1,2], Alison Shea[1,2], Elena C. Ballantyne[1,2], David L. Streiner[1], Benicio N. Frey[1,2], Randi E. McCabe[1,2]. [1]McMaster University, Hamilton, ON, Canada; [2]St. Joseph's Healthcare Hamilton, Hamilton, ON, Canada

Objective: Sexual concerns are reported by 68% to 87% of peri- and post-menopausal women, and have been found to contribute to poor self-image, and negatively impact physical and emotional well-being. Despite the high prevalence and negative impacts, treatment options, particularly non-pharmacological ones, are quite limited. The primary objective of this clinical trial was to evaluate the efficacy of a four-session individual Cognitive Behavioural Therapy protocol for improving sexual satisfaction and reducing distress during peri- and post-menopause (CBT-SC-Meno). Secondary objectives included assessing sexual functioning, body image, relationship satisfaction, menopausal symptoms (e.g., vasomotor), depression, and anxiety. **Design:** Participants (n = 30) were peri- or post-menopausal women experiencing primary sexual concerns (e.g., decreased desire) and reporting a score of 26.55 or lower on the Female Sexual Function Index (FSFI), to indicate decreased sexual functioning. Eligible participants were assigned to a waitlist control condition for four weeks, after which they completed four individual CBT-SC-Meno sessions. Participants completed measures assessing sexual satisfaction, distress, and desire [FSFI, Female Sexual Distress Scale-Revised (FSDS-R), Female Sexual Desire Questionnaire (FSDQ)], as well as menopause symptoms [Greene

Climacteric Scale (GCS), Hot Flash Rated Daily Interference Scale (HFRDIS)], body image [Dresden Body Image Questionnaire (DBIQ)], relationship satisfaction [Couples Satisfaction Index (CSI)], depression [Beck Depression Inventory-II (BDI-II)], and anxiety [Hamilton Anxiety Rating Scale (HAM-A)] at baseline, post-waitlist, and post-treatment. Participants also completed the Client Satisfaction Questionnaire at post-treatment. **Results:** No significant changes were observed during the waitlist period across all measures, apart from the FSDQ concern subscale and GCS physical subscale. Participants experienced a significant decrease in symptoms of sexual distress, concern, and resistance, menopausal symptoms, symptoms of depression and anxiety, as well as improved body image and couple satisfaction ($p<0.05$). Further, 100% of participants indicated that they were very satisfied with the treatment and that it helped them cope with their symptoms more effectively. Qualitative treatment satisfaction outcomes were also captured, outlining reasons for high acceptability among other important experiences, and will be reported at the time of presentation. **Conclusion:** This is the first study, to our knowledge, that has examined the efficacy of a CBT protocol specifically aimed to improve sexual concerns experienced during peri- and post-menopause. Results suggest that CBT-SC-Meno leads to significant improvements across several important sexual concern domains, in addition to commonly co-morbid symptoms (e.g., depression, anxiety, body image). This study suggests evidence of a non-pharmacological treatment for peri- and post-menopausal women experiencing sexual concerns and will provide the basis for a larger randomized clinical trial. This form of treatment may not only be preferred by some, but necessary for others as consumer demand increases for non-pharmacological treatments for peri- and post-menopausal symptoms.

Sources of Funding: Women's Health Clinical Mentorship Grant (#433269) from the Canadian Institute of Health Research.

FRIDAY CONCURRENT SESSION #1

S-17.

Childhood Maltreatment and Sexual Function in Midlife Women: The Study of Women's Health Across the Nation

Mariam Saadedine[1], Yuefang Chang, PhD[2], Stephanie Faubion[1], Holly N. Thomas, PhD[3], Nancy E. Avis, PhD[4], Alicia B. Colvin, PhD[5], Rachel Hess, MD[6], Rebecca Thurston[7]. [1]General Internal Medicine, Mayo Clinic, Jacksonville, FL; [2]Neurosurgery, University of Pittsburgh, Pittsburgh, PA; [3]Medicine, University of Pittsburgh, Pittsburgh, PA; [4]Social Sciences and Health Policy, Wake Forest University School of Medicine, Winston-Salem, NC; [5]Epidemiology, University of Pittsburgh School of Public Health, Pittsburgh, PA; [6]Internal Medicine, University of Utah, Salt Lake City, UT; [7]Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA

Objective: To test whether a history of childhood maltreatment (abuse, neglect) was associated with sexual inactivity and worse sexual function in women longitudinally over the menopause transition. **Design:** The study sample comprised 1712 women from the Study of Women's Health Across the Nation (SWAN) who completed assessments of sexual activity and sexual function and childhood maltreatment. At baseline, participants were ages 42-52, pre or early perimenopausal, and not using hormone therapy. Childhood maltreatment was assessed during visit 15 using the Childhood Trauma Questionnaire (CTQ), which consists of 5 subscales: sexual abuse, physical abuse, physical neglect, emotional abuse, and emotional neglect. Any abuse or neglect was established if women scored at or above specific thresholds on any of the subscales: ≥8 for physical abuse, physical neglect and sexual abuse, ≥10 for emotional abuse, and ≥15 for emotional neglect. Questionnaires assessing sexual activity and function were completed over eight of the SWAN visits (follow up visits 3 through 15). Participants were asked whether they had engaged in sexual activity with a partner in the past 6 months. Sexual function was assessed among those who were sexually active via a questionnaire that assessed five domains (desire, arousal, emotional satisfaction, orgasm, pain), with scores dichotomized. Associations between childhood maltreatment and (a) being sexual active and (b) sexual function were evaluated using Generalized Estimating Equations (GEE). Covariates were introduced in three steps: 1) demographics (age, race/ethnicity, site, education, financial strain), 2) demographics and menopause status, 3) demographics, menopause status, depressive symptoms, and antidepressant use. **Results:** A total of 1712 women were included in the analysis (mean age at baseline = 48.9 years, 48% White, 27% Black, 10% Chinese, 5% Hispanic, 10% Japanese). Half of the women (52%) had experienced abuse or neglect during childhood. At baseline, most women were married (69%) and almost half of the women had a college degree or higher (49%). Emotional neglect (OR = 0.55, 95% CI 0.43-0.7, $p<0.001$), physical abuse (OR = 0.75, 95% CI 0.61-0.96, $p=0.019$), and emotional abuse (OR = 0.69, 95% CI 0.56-0.85, $p = 0.001$) were each significantly associated with lower odds of being sexually active with a partner in fully adjusted models. Experiencing any abuse or neglect was associated with poorer overall sexual function ($b = -0.33$, $SE = 0.16$, $p = 0.039$) in demographic-adjusted models; but associations did not persist with additional covariate adjustment. When considering individual sexual function domains, a history of any abuse or neglect was associated with lower odds of being emotionally satisfied with the sexual relationship in fully adjusted models (OR = 0.66, 95% CI 0.55-0.78, $p < 0.001$). **Conclusion:** Childhood maltreatment is associated with sexual inactivity and lower emotional satisfaction with sexual relationships during the menopause transition. This association was independent of other factors known to correlate with childhood adversity and influence sexual function. Findings point to the lasting impact of childhood maltreatment into midlife and the need for a multidisciplinary approach to address sexual concerns in midlife women, considering their life experiences.

Sources of Funding: 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, and U19AG063720).

S-18.

Beyond Bruises: Under-Recognized Forms of Sexual and Intimate Partner Violence Among Women and Implications for Clinicians and Researchers

Karen Jakubowski, PhD, Alana J. Castle, BS, Zhiyu Yu, BS, Elizabeth Miller, MD, PhD, Judy Chang, MD, MPH, Rebecca Thurston. University of Pittsburgh, Pittsburgh, PA

Objective: Evidence indicates that gender-based violence, including sexual violence (SV) and intimate partner violence (IPV), is related to poor health among women. However, the literature is limited in several key ways: it largely focuses on reproductive-age women; it primarily involves single-item measures of physical/sexual violence; it lacks nuanced study into forms of SV and IPV that do not involve physical contact, including sexual harassment and sexual cyber abuse; and there is little study of how abusive partners attempt to control women's decisions and behaviors, including around finances and contraception. Moreover, we have recently identified a novel type of IPV involving violent or controlling behaviors that target or impact sleep ("sleep coercion"). Here, we report initial data on exposure to contact (i.e., unwanted touching, coerced sex, sexual assault) and non-contact sexual violence (i.e., sexual harassment, cyber sexual abuse) and IPV and coercive control among midlife women. **Design:** Participants were drawn from two ongoing studies on IPV and health with a shared assessment battery. Roughly half of the sample was recruited on the basis of ongoing/prior IPV. Women self-reported demographics and lifetime violence exposure using validated multidimensional measures of IPV (National Intimate Partner and Sexual Violence Survey), economic abuse (Scale of Economic Abuse), sexual cyber dating abuse (Cyber Dating Abuse Experiences Scale), and reproductive coercion (Reproductive Coercion Scale). A subsample of women who reported ongoing/prior IPV (N=30) additionally completed 1-hour qualitative, semi-structured interviews via Zoom on their exposure to sleep coercion. Interviews were audio-recorded, transcribed and coded for themes. **Results:** Participants included 81 women aged 23-62 [$M(SD)$=46.2(9.4) years; 16% Black; 7% South Asian, Arab/Middle Eastern, Korean, or self-described; 5% Multiracial; 72% white; 12% sexual minorities]. As shown in Table 1, most women reported exposure to verbal sexual harassment, unwanted touching, or sexual cyber dating abuse. Over 30% of women reported history of coerced sex and sexual assault involving alcohol/drugs or threats/force. Considering IPV, 75% of women reported stalking or psychological aggression. Half of women reported economic abuse and 15% reported experiences of reproductive coercion. Qualitative results supported the novel construct of sleep coercion. Key themes from interviews on violence and sleep included: (1) intentional interruptions during sleep (*"He would turn on lights, slam drawers, stomp around"*); (2) dictating routines (*"I [had] to go to bed when he did"*); (3) monitoring sleep (*"He had hidden cameras in the bedroom"*); (4) abuse during sleep (*"I'd wake up to him touching me"*); and (5) fear/vigilance of sleep (*"I never fell asleep before him"*). **Conclusion:** Findings provide evidence for the prevalence of contact and non-contact sexual violence and IPV among midlife women with histories of interpersonal violence, including understudied forms of IPV (economic abuse, reproductive coercion) and a novel form of IPV (sleep coercion). While the prevalence of SV and IPV was higher than national estimates, due to the selection criteria of this sample, results underscore the need for clinicians to recognize the myriad ways that SV and IPV may impact care seeking and health during midlife. Clinicians should consider SV, IPV, and sleep coercion in their differential diagnoses and offer information and resources to all patients.

Sources of Funding: K23HL159293, Pitt UCSUR

Table 1. Prevalence of Sexual & Intimate Partner Violence (N=81 women)

Violence Type	N (%)
Sexual Violence	
Sexual harassment	71 (87.7%)
Unwanted touching	58 (71.6%)
Sexual cyber dating abuse	44 (54.3%)
Coerced sex	37 (45.7%)
Alcohol- or drug-facilitated unwanted sex	31 (38.3%)
Unwanted sex due to threats of harm/force	25 (30.9%)
Intimate Partner Violence	
Psychological aggression	62 (76.5%)
Stalking	60 (74.0%)
Physical violence	45 (55.6%)
Economic abuse	41 (50.6%)
Reproductive coercion	14 (17.3%)

S-19.

Associations Between Self-Compassion and Inflammation Among Midlife Women

Caitlyn Johnson, B.A.[1], Karen Jakubowski, PhD[1], Mary Y. Carson, M.S.[2], Pauline Maki, PhD[3], Rebecca Thurston, PhD[1,2]. [1]Department of Psychiatry, University of Pittsburgh, Pittsburgh, PA; [2]Department of Psychology, University of Pittsburgh, Pittsburgh, PA; [3]Departments of Psychiatry, Psychology and OB/GYN, University of Illinois at Chicago, Chicago, IL

Objective: Inflammation plays a critical role in the pathophysiology of numerous chronic diseases, including cardiovascular disease (CVD). Previous literature indicates that positive psychological states, such as self-compassion, may be associated with reduced CVD risk. We tested whether greater self-compassion was associated with lower circulating markers of inflammation (interleukin-6 [IL-6], high sensitivity C-reactive protein [hsCRP]) among midlife women. **Design:** Participants were 274 midlife women aged 45-67 years old, free of CVD. Women completed validated measures of self-compassion (Self-Compassion Scale-Short From) and depressive symptoms (Center for Epidemiological Studies-Depression); reported medical history and medication use via interview; and provided body mass index (BMI) and a fasting blood draw for IL-6 and hsCRP. Women were excluded if they had an autoimmune disorder or took immunosuppressive medications (N=15), and for hsCRP analyses, had values of hsCRP>10 mg/L (suggestive of acute infection; N=26). Relations between the total self-compassion scores and IL-6 (log; N=260 women) and hsCRP (log; N=232 women) were assessed in linear regression models, adjusting for age, race/ethnicity, education, BMI (log), and other anti-inflammatory medication use (e.g., over-the-counter). Depressive symptoms were evaluated as a mediator using the products of coefficients method. **Results:** Women were on average 59 years old; 78% identified as white, 18% Black, 2% Asian or Pacific Islander, and 2% Multiracial. Women who reported greater self-compassion had lower IL-6 [B(SE)= -0.018(.008), p=.03, multivariable]. Self-compassion was not related to hsCRP [B(SE)=0.015(.01), p=.24, multivariable]. Associations between self-compassion and IL-6 were mediated by depression [indirect effects of self-compassion on IL-6 through depression: effect (95% confidence intervals) = -0.009 (-0.02, 0)]. **Conclusion:** Greater self-compassion was associated with reduced IL-6, not with hsCRP, after adjusting for covariates. Depression was a significant mediator of the relationship between self-compassion and IL-6. Practicing self-compassion may minimize the body's biological and psychological stress responses, promoting overall health.

Sources of Funding: NIH grants (RF1AG053504 and R01AG053504 to RCT & PMM), NHLBI (K24HL123565 and R01HL105647 to RCT)

S-20.

Trauma Exposure, Brain Age, and Plasma Alzheimer's Disease Biomarkers in Women

Rebecca Thurston[1], Yuefang Chang, PhD[2], Jinghang Li[3], Minjie Wu[1], Howard Aizenstein[1], Thomas karikari[1], Lauren Watford[4], Karestan Koenen[5], Pauline Maki[6]. [1]Psychiatry, University of Pittsburgh, Pittsburgh, PA; [2]Neurosurgery, University of Pittsburgh, Pittsburgh, PA; [3]Bioengineering, University of Pittsburgh, Pittsburgh, PA; [4]Psychology, University of Pittsburgh, Pittsburgh, PA; [5]Epidemiology, Harvard Chan School of Public Health, Boston, MA; [6]Psychiatry, University of Illinois, Chicago, Chicago, IL

Objective: Although trauma exposure has been associated with poor health in women, including brain health, this research has been largely focused on childhood trauma. The understanding of how adult trauma relates to women's brain health at midlife, particularly using neuroimaging-based measures of brain age and Alzheimer's Disease (AD) biomarkers, is not well understood. Advances in neuroimaging-based measures of brain age provide an integrated assessment of one's brain age beyond one's chronologic age; they can also differentiate white matter and gray matter brain age, notable given early indication that white matter changes may be particularly relevant for women's brain health. Further, recent advances in assessing AD risk include blood-based AD biomarkers that are particularly useful to assessing risk decades before the emergence of AD dementia. We tested whether (1) women with greater trauma exposure had older brain age, considering both gray matter and white matter brain age, (2) women with greater trauma exposure had adverse AD biomarker profiles, and (3) associations between trauma exposure and brain age or AD biomarkers varied by race/ethnicity. **Design:** The MsBrain study enrolled 274 women aged 45-67 who had a uterus and at least one ovary, were late peri- or postmenopausal, did not have a neurological disorder, and were not using SSRI/SNRIs or hormone therapy. Women underwent physical measures, questionnaires (including for trauma exposure, assessed via a 9-item lifetime trauma checklist), an interview, 3T brain magnetic resonance imaging, and a fasting blood draw for apolipoprotein E genotyping and the assessment of plasma concentrations of AD biomarkers amyloid β (Aβ) 42/40 ratio, phosphorylated tau (p-tau 181 and 231), glial fibrillary acidic protein (GFAP), and neurofilament light (NfL) (via Single molecule array technology). Pre-trained deep learning-based brain age models were used to estimate white matter and gray matter age. Associations between trauma exposure, white and gray matter brain age, and AD biomarkers were tested in linear regression models with covariates age, race/ethnicity, education, body mass index, and apolipoprotein E4 status. Interactions by race/ethnicity (Black vs. white) were tested. **Results:** A total of 252 (mean age=58.98 years, 79.8% white, 16.3% Black, 3.9% other ethnicities) participants contributed data. Greater lifetime trauma exposure was associated with older white matter brain age [3+ traumas: B(SE)=3.56(1.50), p=.019; 1-2 traumas: B(SE)= 3.53 (1.23), p=.005, vs. no trauma, multivariable]. There were no significant associations of trauma with gray matter brain age. While trauma was not significantly related to AD biomarkers for the sample as a whole, significant interactions between trauma and race/ethnicity in relation to both NfL (p=.01) and GFAP (p=.01) indicated that among Black women only, greater trauma exposure was related to higher NfL [3+ traumas: B(SE)=.45(.18), p=.018; 1-2 traumas: B(SE)=.02 (.20), p=.92, vs. no trauma, multivariable] and GFAP [3+ traumas: B(SE)=.49 (.20), p=.019, 1-2 traumas: B(SE)=.04(.22), p=.86, vs. no trauma, multivariable]. When individual traumas were considered, sexual trauma emerged as the most potent trauma for both white matter brain age and, for Black women, NfL and GFAP. **Conclusion:** Greater trauma exposure was associated with indicators of accelerated brain age, particularly white matter brain age, and for Black women, greater neuroinflammation and neuronal death. Sexual trauma emerged as particularly toxic for women's brain health. Findings indicate the importance of preventing trauma to support women's brain health as they age. Funded

Sources of Funding: Funded by NIH/NIA RF1AG053504 & R01AG053504 (Thurston & Maki)

S-21.

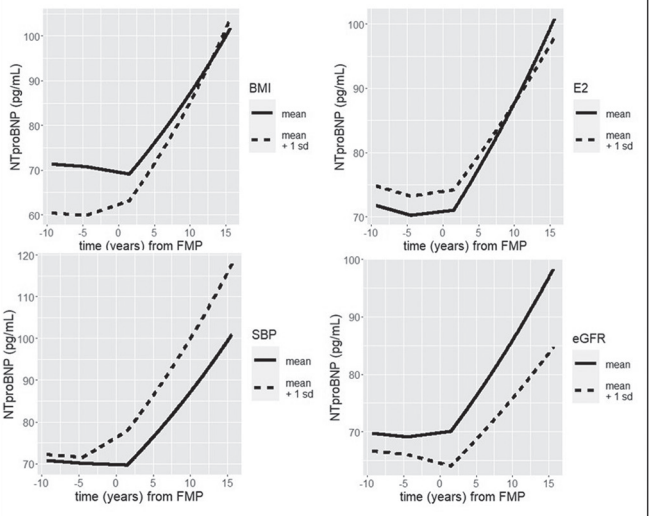
Correlates of N-terminal Brain Natriuretic Peptide (NTproBNP) Trajectory over the Menopause Transition: The Study of Women's Health Across the Nation

Samar R. El Khoudary, PhD[1], James Matuk[1], Carol Derby, PhD[2], Daniel McConnell[3], Rebecca Thurston[1]. [1]University of Pittsburgh, Pittsburgh, PA; [2]Albert Einstein College of Medicine, New York, NY; [3]University of Michigan, Ann Arbor, MI

Objective: NTproBNP is a strong predictor of cardiovascular disease (CVD). It increases as women traverse the menopause transition (MT). Yet, factors that correlate with changes in NTproBNP over the MT are not clear. We assessed associations of midlife factors with NTproBNP trajectory over the MT. **Design:** Women with a known final menstrual period (FMP) and NTproBNP assessed for up to 5 times across the MT were included. Splines showed a nonlinear trajectory of NTproBNP with two knots demarcating 3 time segments: segment 1: >4.5Yrs pre FMP; segment 2: 4.5Yrs pre FMP to 1.5Yrs post FMP; and segment 3: >1.5Yrs post FMP. Piecewise-linear mixed models were used to test independent associations of midlife body mass index (BMI), systolic blood pressure (SBP), estradiol (E2) and estimated glomerular filtration rate (eGFR) with NTproBNP changes in segments 2 and 3. Site, race/ethnicity, education, comorbidity, and time-varying financial hardship, smoking, physical activity and menstrual cycle day of the blood draw were adjusted for. **Results:** 1244 women (baseline age 46.9(SD: 2.8) Yrs; 44% White, 29% Black, 11% Chinese, 12% Japanese, 5% Hispanic) were included. NTproBNP increased only 1.5 Yrs post FMP (β (95%CI): 0.027 (0.013, 0.042) log-NTproBNP per 1 Yr increase). Higher BMI and lower E2 were independently associated with greater NTproBNP rise 1.5 Yrs post FMP, whereas higher SBP and lower eGFR were associated with greater rise within 4.5 Yrs pre to 1.5 Yrs post FMP, **Figure**. White women had significantly higher NTproBNP levels over time compared to other groups. **Conclusion:** Women experience an acceleration in NTproBNP over the MT. Midlife SBP, BMI, eGFR and E2 independently contribute to this acceleration at different times relative to the FMP. Findings call for future research to test whether modifying these factors during midlife could reduce the later CVD risk related to higher NTproBNP levels over the MT.

Sources of Funding: NIA, NINR, OWHR

Figure. Correlates of NTproBNP Trajectory over the Menopause Transition



Continuous covariates are fixed to their mean during estimation, while categorical covariates are fixed to reference categories: race- White, site- Pittsburgh, education- <high education, smoking- never, financial hardship- very, comorbidity score- no comorbidities, cycle day- not within day 2-5.

FRIDAY CONCURRENT SESSION #2

S-22.

Menopause in Medicine: An exploratory survey of Canadian women physicians

Shannon E. Brent, MD, MPH[1], Lindsay Shirreff, MD, MSc(HQ)[1,2], Natalie Yanchar, MD MSc FRCSC[3], Marie Christakis, MD, MPH[1,2]. [1]Department of Obstetrics and Gynaecology, University of Toronto, Toronto, ON, Canada; [2]Department of Obstetrics and Gynaecology, Mount Sinai Hospital, Toronto, ON, Canada; [3]Department of Surgery, University of Calgary, Calgary, AB, Canada

Objective: Menopause is a significant, universal hormonal transition, with symptoms impacting ~80% of women. Research suggests that menopause may be professionally disruptive, contributing to decreased productivity, absenteeism, and early exit from the workplace. The impact of menopausal symptoms on woman physicians has not been previously evaluated in Canada. We sought to describe the landscape of menopause among Canadian women physicians and explore its potential impact on work performance, job satisfaction, and absenteeism in the field of medicine. **Design:** In this exploratory study, Canadian physicians self-identifying as women and peri-menopausal or menopausal were invited to participate in an online survey between May-September 2023. Demographic and practice characteristics data were collected. A modified Menopause Rating Scale (MRS) was used to quantify symptom burden retrospectively. Primary outcome was self-reported work performance. Secondary outcomes included perceived impact of menopause on promotional opportunities, absenteeism, and job satisfaction. Multivariable linear regression was used to examine associations between MRS scores and outcomes of interest, controlling for possible confounders. **Results:** Among 217 respondents, 47.7% reported a severe menopausal symptom burden; 40% felt menopause negatively impacted work performance, and 16.1% expressed job dissatisfaction. However, fewer than 10 respondents (4.6%) ever took time off for menopausal symptoms. Increasing MRS scores were significantly associated with negative perceived work performance ($p< 0.001$), fewer promotional opportunities ($p< 0.001$), and lower job satisfaction ($p=0.006$) when controlling for confounders. **Conclusion:** Canadian women physicians can experience severe menopausal symptoms, often without support. This needs assessment highlights an important occupational health issue and suggests that opportunities remain for medical institutions and employers to formally recognize this life stage of women physicians and improve well-being for this valuable workforce.

Sources of Funding: St. Michael's Hospital Chair in Womens Health, Dr. Sari Kives

S-23.

Age at Menopause and Cognitive Complaints Associate with Digital Cognitive Outcomes at the Well-Woman Visit

Jillian L. Joyce[1], Silvia Chapman[2], Sarah E. Tom[2], Teresa Facchetti, BSc, MSc, PhD candidate (On going)[2], Sandra J. Rizer[2], Samantha A. Dargie[2], Teal Eich[1], Karen Marder[2], Mary L. Rosser[2], Stephanie Cosentino[2]. [1]University of Southern California, Los Angeles, CA; [2]Columbia University Irving Medical Center, New York, NY

Objective: The Women's Preventive Services Initiative (WPSI) Recommendations for Well-Woman Care include a set of guidelines to promote a broad range of preventive services for women, including mental health and cancer screening. Surprisingly, cognitive screening of post-menopausal women is not recommended even though the prevalence of Alzheimer's disease (AD) is higher among women. Indeed, women aged 60 or above are twice as likely to develop AD than breast cancer. Recent evidence suggests that women experience AD-related brain changes earlier than men, possibly occurring around the menopausal transition, but are diagnosed later than their male counterparts. Cognitive screening as part of well-woman care may be a critical step in addressing care disparities. In this study, we examined performance on a novel digital cognitive screening measure, the Linus Health Core Cognitive Evaluation (CCE), among post-menopausal women at the time of the well-woman visit. We hypothesized that earlier age of menopause and the presence of subjective cognitive difficulties would be associated with lower performance on the objective digital screener. **Design:** The sample included 86 post-menopausal women without dementia seen as part of the Evaluating Memory as Part of Women's Routine Care (EMPOWER) study at the time of their routine well-woman visit (average age 65.3± 8, range 52-83). Subjective cognition was assessed with the SCoPE (Screener for Cognitive Problems in Everyday Life). Objective cognitive screening was conducted with the CCE, which comprises a digitized version of the Mini-Cog (three word recall and clock drawing). Linear regression models examined subjective cognition and age at menopause as individual and combined predictors of performance on the CCE. Models were evaluated using adjusted R Square, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC). Age was included as a covariate in all models. **Results:** CCE scores range from 0-5. On the CCE, 62.8% (n=54) of women scored in the normal category (scored 4-5), 36% (n=31) performed in the borderline category (scored 2-3), and 1.2% (n=1) performed in the impaired category (scored 0-1). Average performance on the CCE was 3.9 (±1). SCoPE scores ranged from 0-5, with higher scores indicating more cognitive complaints. Average SCoPE score was 0.7 (±1). As detailed in Table 1, higher SCoPE scores and earlier age at menopause independently associated with lower performance on the CCE, and within a combined model. AIC, BIC, and adjusted R-Square values indicated that the combined model, including both SCoPE and age at menopause, was the best fit. **Conclusion:** Routine cognitive screening is critical for addressing the increased prevalence of AD in postmenopausal women. In line with hypotheses and previous work indicating that earlier menopause puts women at higher risk for cognitive difficulties later in life, age at menopause in the current sample predicted performance on a novel, objective cognitive screener at the well-woman exam. Moreover, having cognitive complaints along with earlier age at menopause was most strongly associated with lower objective cognitive scores. Results from this study support the utility of cognitive screening at the well-woman visit as a tool to identify women who may benefit from more comprehensive cognitive evaluation, and suggest that women with earlier age at menopause along with cognitive complaints may be at highest risk for concurrent cognitive impairment.

Sources of Funding: Alzheimer's Association and The Mary E. Groff Charitable Trust

Table 1: Regression Models

	SCoPE and Age	Age at Menopause	SCoPE and Age at Menopause
Age β (p-value)	-.15 (.149)	-.15 (.163)	-.17 (.085)
SCoPE β (p-value)	-.33 (.002)		-.32 (.002)
Age At Menopause β (p-value)		.30 (.006)	.29 (.005)
Model p-value	.005	.012	<.001
Adjusted R Square	.098	.081	.171
AIC/BIC values	18.451/25.779	20.096/27.424	12.262/22.032

S-24.

User Outcomes for an App-Delivered Hypnosis Intervention for Menopausal Hot Flashes

Gary Elkins, Ph.D.. Psychology and Neuroscience, Baylor University, Waco, TX

Objective: Hypnotherapy has been shown to be a safe, nonhormonal treatment that is effective for treating menopausal hot flashes. The North American Menopausal Society has designated hypnotherapy as having Level I research evidence as an intervention for menopausal hot flashes; meaning it can be recommended on the basis of good and consistent scientific evidence. However, women suffering from hot flashes may lack access to in-person hypnotherapy due to barriers such as financial considerations or proximity to a qualified health care provider with expertise in hypnotherapy. Hypnotherapy is a uniquely beneficial intervention for hot flashes, as hypnotherapy can be employed in conjunction with other treatments if desired in order to manage the negative effects of hot flashes. In addition, hypnotherapy may provide secondary outcomes, such as the reduction of anxiety and stress. To expand access to hypnosis for hot flashes, a smartphone app has been created to deliver hypnotherapy. The Evia app, developed by Mindset Health, delivers patient education and audio recorded hypnosis sessions and has the potential to help individuals suffering from hot flashes and stress associated with menopausal symptoms. However, there has been a lack of research on user characteristics and outcomes with app delivered hypnotherapy for menopausal hot flashes. The present study aims to fill this gap regarding user outcomes regarding hot flash reductions for users of the Evia app. **Design:** This study is a retrospective analysis of a dataset of Evia app users provided by Mindset Health. Participants were 428 women with three or more daily hot flashes who used the Evia app between October 2021 and February 2024. The mean age of participants was 52.4 (SD = 5.4), and the mean number of daily hot flashes at baseline was 6.8 (SD = 3.696). The Evia program experienced by users includes a 5-week program with daily tasks including educational readings, hypnotic inductions, and daily hot flash tracking. The app utilizes audio recorded hypnosis and mental imagery for coolness, such as imagery for cool breeze, snow, or calmness. **Results:** A clinically significant (50%) reduction in daily hot flashes was experienced by 69.9% of women from baseline to their last logged Evia survey. On average, women experienced a 53.7% reduction in their daily hot flashes while using the Evia app. At baseline, the self-reported hot flash severity varied, with 28.6% reporting mild hot flashes, 43.4% reporting moderate hot flashes, 21.6% reporting severe hot flashes, and 6.3% reporting very severe hot flashes. Regarding the menopausal stage of users, the majority of women (38.7%) were peri-menopausal, 22.2% were post-menopausal, 12.6% were menopausal, and 36.4% responded as uncertain. The majority (87.9%) of Evia users were not using hormonal therapy to address their hot flashes, with only 10.7% reporting hormonal therapy, and 1.4% reporting using hormonal therapy but weaning off. A nonhormonal tool to manage hot flashes was extremely important to 36.4% of users, somewhat important to 13.3% of users, and not important to 2.1% of users. The majority (54.9%) of users had never heard of using hypnotherapy for hot flashes, with only 10.7% indicating previously using hypnotherapy. **Conclusion:** Hypnotherapy is a well-researched, efficacious treatment for hot flashes, with the potential to improve women's lives by reducing daily hot flashes without hormonal or pharmacological intervention. This is the first study to report on the effect of an app-delivered hypnosis intervention for menopausal hot flashes, The results demonstrate that the users of the Evia app experience clinically significant reduction in hot flashes. This is an innovative delivery of hypnotherapy for hot flashes and has important clinical implications for patient care. Hypnotherapy is a safe behavioral intervention that has few or no side effects. It can be used in conjunction with other therapies (such as pharmacological and low dose hormone therapy) or as a primary method of managing hot flashes. The Evia app is a promising delivery of hypnotherapy. Future studies are needed to further evaluate the Evia app through randomized controlled trials in order to increase accessibility to hypnotherapy and help relieve the suffering of women experiencing menopausal hot flashes.

Sources of Funding: National Institutes of Heatlh

S-25.

Distinct Biological Systems in Pre- and Postmenopausal Women: Implications for Breast Cancer Outcomes

Xi Huang, Ph.D.[2,1], Lung-Chi Chen[2]. [1]Research & Development, FE:I Beauty Tech, Inc., Montvale, NJ; [2]Medicine, NYU School of Medicine, New York, NY

Objective: Our research series explores the role of iron in conditions like breast cancer (BC), osteoporosis, and skin aging, focusing here on BC. While high estrogen (E2) levels correlate with BC risk, they don't clarify why younger women often have high recurrence rates of estrogen receptor-negative (ER-) tumors, or why older postmenopausal women

predominantly develop low-grade, ER+ tumors despite a 90% drop in E2. This study investigates how different biological systems in pre- and postmenopausal women might influence BC outcomes, particularly through iron's impact. **Design:** We analyzed iron and estrogen levels across age groups using data from NHANES III and tested our hypothesis *in vitro* due to the correlative limitations of human studies and the absence of suitable animal models. We developed cell culture models to simulate the hormonal conditions of premenopause (high E2, low iron) and postmenopause (low E2, high iron) and cultured ER^+ and ER^- cells to measure biomarkers related to BC recurrence and onset. Additionally, mice with intact ovaries on iron-deficient and iron-overload diets were used to validate our findings. Our study is further supported by a literature review of gene expression in BC tissues from younger and older patients. **Results:** We identified distinct biological systems across menopause: high E2 and low iron in premenopause versus low E2 and high iron in postmenopause (Fig. 1). Serum ferritin levels rose two to threefold during this transition, correlating with an increase in body iron storage from 4.8 mg/kg to 12 mg/kg post-menopause. E2 moderately upregulated vascular endothelial growth factor (VEGF) *in vitro*, a key player in BC recurrence. However, iron deficiency significantly enhanced VEGF expression by stabilizing hypoxia-inducible factor-1α, both *in vitro* and *in vivo*. Conversely, high iron levels increased oxidative stress and sustained MAPK activation, crucial for BC development. Gene expression profiles showed more pro-angiogenic activity in BC tissues from younger women. We also found associations between low iron levels, increased serum VEGF in cancer patients, and a link between anemia and intratumoral hypoxia. **Conclusion:** High E2 and low iron in young women may create a pro-angiogenic environment potentially raising BC recurrence rates. Higher body iron levels may foster a pro-oxidant environment that enhances BC development. Our findings indicate that E2 alone does not fully explain BC dynamics; variations in iron levels may play a significant role in influencing BC outcomes not solely explained by E2.
Sources of Funding: Supported by a grant from the National Cancer Institute (R21 CA132684) and in part by NIH Grants ES 00260, CA34588, and CA 16087.

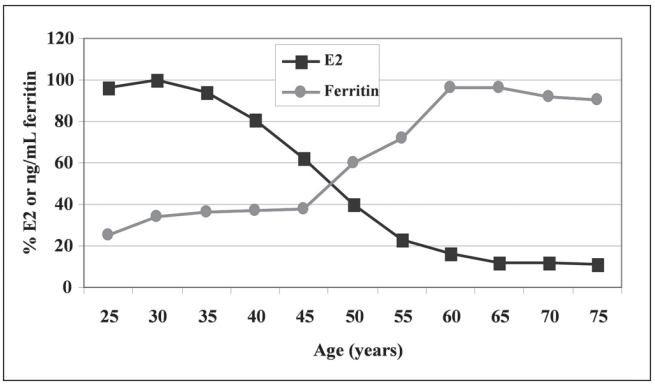


Fig. 1. Concurrent but inverse changes of ferritin *versus* E2 during menopausal transition.

S-26.

Role of increased iron in contributing to postmenopausal osteoporosis independently of estrogen deficiency and gender difference

Xi Huang, Ph.D.[2,1], Lung-Chi Chen, Ph.D.[2]. [1]Research & Development, FE:I Beauty Tech, Inc., Montvale, NJ; [2]Medicine, NYU School of Medicine, New York, NY

Objective: Estrogen is widely acknowledged as a pivotal factor in women's health, yet it does not fully account for the diverse physiological changes that women undergo throughout their lives. Our research encompasses three abstracts that collectively propose iron as a significant contributor to various conditions including breast cancer outcomes, osteoporosis, and skin aging. This abstract focuses on osteoporosis. Postmenopausal osteoporosis is characterized by an imbalance in bone metabolism where bone resorption significantly exceeds bone formation, leading to a substantial loss in bone mineral density (BMD). While estrogen deficiency during menopause is widely recognized as a catalyst for increased bone resorption, additional factors influencing bone formation are less understood. This study seeks to elucidate the role of iron accumulation, resulting from the cessation of menstruation, in postmenopausal osteoporosis. Additionally, it aims to explore how gender differences in BMD are influenced by variations in iron and hormone levels. **Design:** Utilizing data from the Third National Health and Nutrition Examination Survey (NHANES III), we analyzed variations in iron, estrogen, and testosterone levels across different age groups of both genders. The correlative nature of human studies and the absence of suitable animal models to mimic postmenopausal conditions with high iron and low estrogen levels necessitated the development of *in vitro* menopausal systems. We established two distinct cell culture environments to replicate the high estrogen/low iron conditions of premenopause and the low estrogen/high iron conditions of postmenopause. We cultured mouse preosteoclast Raw 264.7 cells, preosteoblast C2C12 cells, and MC 3T3-E1 cells in these environments, assessing specific biomarkers related to bone resorption and bone formation. Further, to distinctly evaluate the impact of iron independent of estrogen, we used hemochromatosis heterozygote ($HFE^{+/-}$) mice with intact ovaries subjected to mild iron overload conditions. **Results:** Analysis of the NHANES III data highlighted a distinct inverse relationship between estrogen and iron levels during the menopausal transition, suggesting that these elements may function inversely across a woman's lifespan. In contrast, the relationship between iron and testosterone in men showed a direct positive correlation, with levels both peaking from ages 20 to 40 and then declining, which may affect bone density differently than in women. Our *in vitro* experiments demonstrated that while increased iron levels did not significantly affect osteoclast differentiation, they substantially inhibited the activity of alkaline phosphatase (ALP) and downregulated critical osteoblastogenic markers such as Runx2, osterix, osteopontin, and osteocalcin in osteoblasts. This suggests a profound negative impact of iron on bone formation. Our *in vivo* findings from the $HFE^{+/-}$ mice models confirmed a significant decrease in BMD, mirroring the *in vitro* results. Additionally, large population studies reinforced these findings, showing a dose-dependent positive correlation between serum ferritin levels and accelerated bone loss in both genders, with a more pronounced effect in postmenopausal women. **Conclusion:** The findings from this study underscore the detrimental role of iron accumulation in bone formation, particularly by inhibiting differentiation of osteoblast progenitor cells, thus exacerbating bone loss in postmenopausal women alongside estrogen deficiency. Furthermore, the interactions between elevated testosterone and iron levels in men might mitigate similar bone loss, possibly explaining the lower incidence of osteoporosis in older men compared to women. These insights highlight the complex interplay of hormonal and iron-related pathways in bone health, suggesting that both factors are critical in understanding the mechanisms behind gender differences in osteoporosis and could inform targeted therapeutic strategies.
Sources of Funding: Supported in part by the Applied Research Support Fund from the NYU School of Medicine

POSTER PRESENTATIONS

P-1.

Potential Implications for Cardiovascular Disease in Perimenopausal People: Investigating Differences in Nocturnal Hot Flashes in the First vs. Second Half of the Night

Annika K. Houge[1,2], Isabel Aldort[1,2], Randi Garcia, Ph.D.[3,4], Sarah Witkowski, PhD[1]. [1]Exercise & Sport Studies, Smith College, Northampton, MA; [2]Neuroscience, Smith College, Northampton, MA; [3]Statistical and Data Sciences, Smith College, Northampton, MA; [4]Psychology, Smith College, Northampton, MA

Objective: Nocturnal hot flashes (HF) are a major symptom of those undergoing the menopausal transition that can affect quality of life. A National Sleep Foundation study found that over half of perimenopausal individuals surveyed experience difficulty sleeping due to vasomotor symptoms. Perimenopause is a time when risk for cardiovascular disease (CVD) increases dramatically. Disruptions to REM sleep can lead to increased risk of developing CVD. It is well-documented that the majority of REM sleep occurs in the second half of the night and that thermoregulation is reduced during REM sleep; however, there are conflicting findings in the current literature on whether more HFs occur during the first or second half of the night. Understanding when HFs occur during sleep may shed light on the consequences for CVD risk. The goal of this analysis was to identify if there were differences in objectively measured HFs in the first vs. second half of the night in perimenopausal people. We hypothesized that a greater proportion of HF would occur during the second half of the night and that the rate of HFs would be greater during the second half of the night. **Design:** Healthy, perimenopausal people aged 43-54 free of CVD who experienced objectively-measured nocturnal HF were included in this analysis. 59 participants underwent 2-24hr monitoring periods. Of those, 36 experienced nocturnal HF in at least 1 of the monitoring periods resulting in 50 monitoring periods for this analysis. Perimenopause was defined using STRAW+10 criteria. Participants had not been taking hormone therapy or any other medications that influence HF experience for at least six months. Objective HFs were assessed via sternal skin conductance (Biolog, UFI, Morrow Bay, CA). HFs were defined by a ≥2umho increase in skin conductance over 30s and/or a distinctive HF pattern (rapid rise followed by a slow descent) when accompanied by a subjective indication of a HF. Each individual's sleep time was reported via a sleep log with in-bed and out of bed time. Total in-bed time was divided in half to determine the first and second half of the night. The Wilcoxon signed rank test was used to test for a significant difference in HF rates between the first vs. second half of the night. The McNemar exact test was used to test for a significant difference between the proportion of monitoring periods with HF in the first vs. second half of the night (R studio, version 4.2.1 (2022-06-30)). **Results:** Participants were 49.4±2.7 yr old, with a mean BMI 25.5±4.3, total cholesterol of 185 ±25 mg/dl and blood pressure of 111±12/70.6 ±7.6. 150 nighttime HFs were recorded across 50 monitoring periods. 41% of total HFs occurred during the first half of the night while 59% occurred in the second half. Nine monitoring periods only had HF in the first half of the night, 14 only had HF in the second half of the night, and 27 had HF in both halves of the night. 36 out of the 50 monitoring periods (72%) had at least one HF during the first half of the night while 41 out of the 50 (82%) had at least one HF during the second half of the night. There was not a statistically significant difference in the proportion of monitoring periods with HFs in the first half vs. second half of the night ($p=0.40$). Of those who had at least one HF in the first half of the night, participants experienced 1.72±0.97 HFs in the first half of the night. Of those who had at least one HF in the second half of the night, individuals experienced an average of 2.15 ±1.6 HFs in the second half of the night. The rate of HF was significantly greater in the second half compared with the first half of the night (0.304±0.267 HF/hr vs. 0.424±0.377 HF/hr; $V=251.5$, $Z=-2.13$, $p=0.03$). **Conclusion:** Our preliminary data support the hypothesis that there is a greater HF burden during the second half of the night. Future directions include pinpointing the association of HFs with sleep disruptions and evaluating relations with subclinical CVD risk.
Sources of Funding: Smith College STRIDE Program (Houge, Aldort), NHLBI R151R15HL145650-01A1 (Witkowski)

P-2.

Hormone Replacement Therapy Uptake & Discontinuation Trends in Wales from 1996-2023

Robin Andrews, Health Psychology[1,2], Arron Lacey[3], Kate Bache[2], Emma J. Kidd[1]. [1]School of Pharmacy and Pharmaceutical Sciences, Cardiff University, Cardiff, United Kingdom; [2]Health & Her, Cardiff, United Kingdom; [3]Swansea University, Swansea, United Kingdom

Objective: This study analyzed the prescribing trends of Hormone Replacement Therapy (HRT) in Wales from 1996 to 2023. Outcomes investigated year-on-year variations in HRT prescription rates concerning HRT type (transdermal, local, or oral) and deprivation levels. Additionally, predictors of HRT discontinuation within one year of the first prescription were explored. **Design:** Utilizing the Secure Anonymised Information Linkage (SAIL) databank, containing medical records for 88% of people in Wales, this observational study explored primary and secondary care data. Annual HRT prescription rates from 1996 to 2023 were normalised per 1000 people and categorised by transdermal, local, and oral preparations and per Townsend deprivation quintile. Cox proportional hazard ratios assessed predictors of HRT discontinuation within one year of initiation, focusing on a subsample of women (n = 108,790) aged 40–65 who were prescribed HRT between 1996 and 2021 and who had not undergone an oophorectomy or hysterectomy or been diagnosed with premature menopause. **Results:** Between 1996 and 2023, 324,409 women were prescribed HRT in Wales. Cox regression analysis demonstrated a curvilinear effect of age on HRT abandonment within one year of the first prescription, with abandonment high among women aged 40–43, lowest in the mid-40s to early 50s, before rising again from the mid-50s onwards. Combined oestrogen/progesterone tablets were associated with the lowest abandonment rates, followed by oestrogen tablets and combined patches. Oestrogen gels had the highest abandonment rates, followed by oestrogen patches, vaginal creams, and pessaries. Higher deprivation was associated with increased abandonment and lower prescription rates overall. The year of initiation influenced uptake: trends showed that transdermal and oral prescriptions rapidly declined from 2002 following adverse reports on HRT safety from the Women's Health Initiative and the Million Women Study. Transdermal prescription rates plateaued from 2005 until 2015. From 2016 onwards, transdermal prescriptions modestly increased until 2021, when rates increased exponentially and remained high in 2023. Conversely, oral prescription rates continued to decline from 2002, whereas local prescriptions gradually increased across time. Notably, controlling for the initiation year did not alter regression outcomes. **Conclusion:** These findings highlight disparities in HRT prescribing patterns based on the type of HRT administered, with oral prescriptions declining, local prescriptions gradually increasing, and transdermal prescriptions rapidly increasing, possibly reflecting GP and patient views on the relative safety of the preparations. Predictors of HRT discontinuation within one year suggest that women undergoing natural menopause are more likely to adhere to HRT in their mid-40s to early 50s, possibly due to variances in menopause stage, particularly if initially prescribed tablets rather than transdermal or local preparations, possibly due to variances in administration or symptom relief. Deprivation reduced the likelihood of HRT prescriptions and increased discontinuation, indicating potential barriers to menopause support in deprived areas. One constraint is the data's confinement to regions covered by the SAIL databank, thus omitting patients treated in facilities not incorporated into the databank, such as private healthcare settings. Nevertheless, the substantial sample size indicates strong generalizability of these results. Additional research is needed to tackle socioeconomic inequalities and assess strategies for achieving cost-effective and efficient HRT prescribing practices.

Sources of Funding: The Waterloo Foundation Health & Her

P-3.

Employee Perspectives and Challenges Concerning the Transition of Menopause (EMPACT Menopause): A Menopause Workplace Study

Irene Aninye, PhD, Syreen Goulmamine, MPH, Sarah Chew, MPH, SWHR Menopause Workplace Education Working Group. Society for Women's Health Research, Washington, DC

Objective: Menopause is a universal life stage for women that has far-reaching economic, social, and health care implications during their working years. With over 75% of women participating in the labor workforce during the menopause transition ages of 45-54 (according to the U.S. Bureau of Labor Statistics), it is imperative that employers recognize women's health experiences, including the menopause transition in the context of talent recruitment and retention. Menopause symptoms vary widely and can lead to challenges at work; however, with the appropriate resources and accommodations in place, these women and their employers can successfully navigate these challenges. The Employee Perspectives and Challenges Concerning the Transition of Menopause (EMPACT Menopause) Study aims to improve workplace experiences for the significant portion of the workforce that transitions into menopause by collecting and assessing novel insights from these peri- and post-menopausal individuals, as well as their coworkers and employers. Data from the study and the Society for Women's Health Research's (SWHR) broader menopause work will inform resources and activities that address unmet needs during midlife and support menopause wellness for all women. **Design:** An online survey was conducted by the SWHR for 4 weeks during the summer of 2023. While online surveys may inadvertently exclude individuals who do not have access to the internet or prefer not to engage in online activities, 944 individuals, primarily of U.S. residence (84%), responded to the survey, representing demographic diversity that included age, gender identity, race/ethnicity, job industry, workplace leadership responsibilities, and menopause stage. Additional insights were solicited via a targeted focus group that discussed conversations and experiences with coworkers and employers concerning menopause and other health matters and suggestions for creating menopause-friendly workplace environments and policies. **Results:** The timing of the menopause transition often overlaps with key career growth years for many women, as they may pursue management or senior leadership positions. However, regardless of their career goals, menopause was shown to impact women's career-related decisions: 1 in 4 women considered not pursuing or did not pursue a leadership opportunity due to the impacts of menopause; 1 in 3 women considered reducing or reduced their workload; and 2 in 5 women considered finding or found a new job. Among the most bothersome symptoms reported by peri- and post-menopausal women were sleep disturbances (79%) and brain fog or difficulty with concentration, learning, or memory (78%). 59% of women reported feeling uncomfortable asking for accommodations to manage their menopause-related challenges at work, and 1 in 6 supervisors indicated being uncomfortable setting up accommodations. 97% of U.S.-based employees and supervisors alike indicated that their workplace had no formal policies or resources, or were unaware of such, to address menopause. Nuances in comfort level engaging in menopause-related conversations or incidents varied across age, race/ethnicity, industry, and menopausal status. **Conclusion:** Knowledge about menopause and its impact on the workplace are limited, even among menopausal women. Menopause is rarely discussed in the workplace and is not included in workplace trainings, orientation, or human resource materials. Age, gender, and workplace dynamics were identified as key determinants in workplace conversations about health and requests for health-related accommodations. Recommendations to improve workplace experiences for individuals during and after the menopause transition include the implementation of simple and systemic practices that increase awareness about menopause, eliminate discrimination, and promote diversity and inclusion. Additionally, menopause-friendly policies and specific accommodations for individuals should take into consideration physical, emotional, and intellectual demands of the job. Managing menopause in the workplace calls for a lifespan approach to employee support that ultimately guides the cultivation of better workplaces for everyone.

Sources of Funding: This work was supported by educational sponsorship from Astellas Pharma, Bayer, Nutrafol, and Pfizer.

P-4.

Impact of a menopause digital health benefit on health empowerment and symptom management

Natalie Henrich, PhD, MPH[1], Christa Moss, PhD[1], Alyssa Arnold, MPH[2], Hannah Jahnke, PhD[1]. [1]Clinical Research, Maven Clinic, Brookline, MA; [2]Clinical Outcomes, Maven Clinic, New York, NY

Objective: Perimenopause and menopause have been misunderstood by society and many healthcare providers resulting in poor quality of life and attrition from the workforce during menopause. There is growing demand for evidence-based, accessible benefits for menopausal care. Digital solutions are rapidly emerging with the potential to reshape how people experiencing menopause access care. Little research has assessed the effectiveness of digital supports for menopause. This analysis aimed to understand the needs (baseline empowerment and symptoms), and outcomes (change in empowerment and symptoms) for menopausal people using Maven, a digital health platform for people experiencing menopause, including access to provider appointments, hormone replacement therapy, classes, articles, and support groups. **Design:** Data were obtained from individuals enrolled in Maven's menopause program for at least 3 months and had attended at least one virtual gynecology appointment. Users completed a survey evaluating change in 1) health empowerment and 2) severity of menopause symptoms using the validated Menopause Rating Scale (MRS) plus the addition of weight challenges. **Results:** Data were collected from 129 users (40% perimenopausal, 53% menopausal, 7% preferred not to say or weren't sure). Users self-reported that knowledge and skills to manage menopause, and confidence to improve their health, comfort and well-being improved from baseline (before using the digital health platform) compared to after using the platform (18% vs 72%; 39% vs 82%, respectively) (Table 1). Users also self-reported reduced symptom severity after using the digital health platform, especially for anxiety and depressive moods (Table 2). **Conclusion:** There are high needs during menopause and digital health resources for menopause have the potential to support people to obtain the information and care needed to be empowered to navigate their menopause experience and reduce physical and mental health symptoms. These improvements may also reduce workplace attrition, which has both individual and societal level benefits. A digital health resource for menopause can increase access to resources and contribute to improved well-being for menopausal people.

Sources of Funding: Maven Clinic

Table 1. Change in health empowerment

	Empowerment before using the digital health resource (% of users)	Empowerment after using the digital health resource for at least 3 months
Has the knowledge and skills needed to manage their health during menopause	18%	72%
Confident they could take actions to improve their health, comfort and well-being	39%	82%

Table 2. Prevalence of symptoms at baseline and reduction in symptom severity after using the digital health platform

Menopause Symptoms	Baseline Prevalence of Symptoms (% of users reporting symptom)	Symptom Improvement (% of users reporting reduced severity of the symptom)
Weight challenges	88%	18%
Physical and mental exhaustion	86%	39%
Sleep problems	86%	41%
Depressive moods	83%	45%
Anxiety	80%	55%
Hot flashes, sweating	78%	36%
Sexual problems	66%	23%
Joint and muscular discomfort	62%	25%
Vaginal dryness	59%	29%
Heart discomfort	54%	34%
Bladder problems	47%	37%

P-5.

EmpowerHER: Exploring Whole-person Health and Resilience in Midlife Women with Self-reported Pain

Robin Austin, PhD, DNP, DC, RN, NI-BA, Sripriya Rajamani, PhD, MPH, MBBS. School of Nursing, University of Minnesota, Edina, MN

Objective: The objective of this study was to examine self-reported health challenges, needs and strengths in midlife women with self-identified pain. Midlife health for women and the menopause transition represents a critical window for preventing chronic disease and optimizing health and functioning. Midlife women, ages 45-64, have a higher prevalence of chronic pain related to a variety of health issues (e.g. pelvic pain, migraine headaches, and musculoskeletal conditions). Poorly managed pain during midlife may have long-term effects on women's health later in life by limited physical activity and function. More striking is women receive two-thirds (65%) of all U.S. opioid prescriptions and women 55-64 are at the highest risk of overdose, thus a critical urgency to address chronic pain in midlife women. Pain is now recognized as a complex biopsychosocial (BPS), whole-person health condition influenced by various factors. Current research has shown menopausal women have resilience, which can be used to off-set health challenges, such as chronic pain. However, very few studies have addressed pain during the menopause transition in midlife women using a whole-person resilience-based perspective. This research aligns with national initiatives addressing women's midlife health (e.g. *Biden Administration Executive Order on Advancing Women's Health Research and Innovation; Section 5 Galvanizing Research on Women's Midlife Health*), the public health crisis of chronic pain, and the opioid epidemic. **Design:** This retrospective descriptive study used de-identified data from the consumer-facing application, MyStrengths+MyHealth (MSMH). The MSMH application, developed 2017, is a consumer-facing tool designed to collect self-reported whole-person health data including strengths and consists of 42 strengths, 334 health challenges, and 168 Needs across four domains of health (My Living, My Mind & Networks, My Body, and My Self-care).[8,9] (Figure 1). Data was collected from various community settings between 2019-2023. From the dataset (N=1737), we identified women 45-64 (n=329) and compared self-reported Strengths, Challenges, and Needs for those with (n=220) and without (n=109) self-reported pain. We used SPSS (v28.0) for all data analysis. **Results:** Women participants 45-64 (n=329) were White (95%), Non-Hispanic/Latinx (91.4%) and Married (80.5%). Overall top Strengths were in *Speech and Language* (79.9%); Top Challenges were in *Nutrition* (81.8%); Top Needs were in *Income* (64.7%). Women with *Pain* (n=220) reported significantly (p<0.001) less Strengths [22.9(10.2)]; more (p<0.001) Challenges [29.8(9.7)]; and more (p<0.001) Needs [27.5(13.8)] compared to women without *Pain* (n=109) Strengths [29.4(7.8)]; Challenges [9.8(6.4)]; and Needs [6.5(10.3)]. Those with *Pain* the most frequent health Challenges included: *do not like my exercise plan* (55.9%); *social time only with caregivers* (52.3%); and *hard to move because of pain* (43.2%) (Table 1). **Conclusion:** This study highlights midlife women with pain do have Strengths despite having many Challenges and Needs. There was a broad range of reported Challenges and Needs across domains and suggests prioritizing a whole person health approach for midlife women with chronic pain is paramount, as it addresses the multifaceted needs of this population. A tool such as MSMH enables participants to self-report their whole-person health perspective and an opportunity to contribute their voice within healthcare. This research addresses a critical gap in the science related to midlife women with pain and provides a foundation to using a whole-person resilience-based approach from a place of empowerment. Future research is directed at developing a whole-person resilience-based chronic pain self-management program.

Sources of Funding: None

P-6.

Experiences of physical intimate partner violence and longitudinal cognitive performance in midlife women: findings from the Study of Women's Health Across the Nation (SWAN)

Jillian Baker, MPH[1], Gail A. Greendale, MD[2], Michelle M. Hood[1], Arun S. Karlamanga, MD, PhD[2], Sioban D. Harlow, PhD[1]. [1]Epidemiology, University of Michigan, Ann Arbor, MI; [2]Geriatric Medicine, David Geffen School of Medicine at University of California, Los Angeles, Los Angeles, CA

Objective: Intimate partner violence (IPV) affects about a third of women in their lifetimes and can result in short- and long-term health consequences, including poorer performance on measures of cognitive function. Physical IPV is one form of IPV characterized by physical harms perpetrated by a current or former intimate partner. We assess whether experiencing physical IPV in pre- or early-perimenopause was associated with steeper declines in subsequent tests of cognitive performance. **Design:** This study used data from 1,713 women in the longitudinal cohort Study of Women's Health Across the Nation (SWAN). Women were premenopausal or early perimenopausal at enrollment and transitioned through menopause over the course of the study. This study related information collected at SWAN baseline about physical IPV to repeated measures of scores from the Symbol Digit Modalities Test, the East Boston Memory Test and the Digit Span Backwards (DSB); cognitive outcomes were assessed six times between SWAN follow-up visits 7 and15. Separate linear mixed models were constructed for each cognitive test outcome. Analyses were adjusted for race-ethnicity, education, financial strain, depressive symptoms, trouble sleeping, and bodily pain. **Results:** At SWAN baseline, 3.1% of participants reported experiencing physical IPV in the prior year. In adjusted models, women who reported physical IPV evidenced a statistically significantly greater decline (-0.17 points/year, 95% CI: -0.28, -0.06) in working memory performance (DSB test), compared to women who had not reported prior-year violence at baseline. **Conclusion:** Working memory performance declined faster among women with a history of physical IPV compared to women without this experience. Our findings concur with those of previous cross-sectional reports, which found that physical IPV was negatively associated with working memory. This longitudinal analysis further demonstrates that IPV is related to faster decline in working memory and underscores the importance of further research into IPV and cognition, which may be an under-recognized source of unfavorable cognitive aging.

Sources of Funding: 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, and U19AG063720; JB was supported by T32AG027708). 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.

P-7.

PH80 Nasal Spray for Treatment of Vasomotor Symptoms (Hot Flashes) Associated with Menopause: a Phase 2 Randomized, Controlled Study

Louis Monti, MD, PhD[2], Ross A. Baker, PhD[1], Ester Salmon, MPH[2], Rita Hanover, PhD[2]. [1]Medical Affairs, Vistagen, South San Francisco, CA; [2]Vistagen, Sou, CA

Objective: To evaluate the efficacy, safety and tolerability of daily treatment of PH80, an investigational non-hormonal pherine nasal spray, versus placebo over 4 weeks on vasomotor symptoms (VMS), including hot flashes (HF), in menopausal women. PH80 (epoxyestrenolone) is hypothesized to treat VMS by binding to nasal chemosensory receptors that activate olfactory-limbic-hypothalamic neural circuits and regulate sympathetic nervous system (SNS) activity to cutaneous vasculature and sweat glands. **Design:** Randomized, placebo-controlled, double-blind study in 36 women with moderate-to-severe VMS. Subjects self-administered up to 5 daily doses of placebo or PH80 as needed (single dose = 3.2 μg) for 4 weeks. HF frequency, severity, disruption of daily function, sweating, and safety were recorded daily. Patient-rated Global Impression of Change (PGI-C) and investigator-rated Global Impression of Improvement (CGI-I) were recorded at week 4. Baseline mean HF frequency was ≥8/day in all subjects. **Results:** The mean number of HFs decreased to 3/day in PH80 (n=18) vs. 6/day in placebo-treated subjects (n=18) at Week 1 (P<0.001); by Week 4, the mean number of HFs decreased to 1.5/day in PH80 vs. 5/day in placebo-treated subjects (P<0.001). Mean ratings of VMS severity, disruption in daily function, and sweating at Week 1 and Week 4 were also significantly lower in PH80 vs. placebo-treated subjects. PGI-C (p=0.015) and CGI-I (p=0.053) at Week 4 were greater for PH80 vs. placebo-treated subjects. PH80's safety profile was equivalent to placebo. **Conclusion:** PH80 nasal spray was an effective, safe and well-tolerated treatment for VMS (hot flashes) associated with menopause compared with placebo.

Sources of Funding: The study was sponsored by Pherin Pharmaceuticals (Pherin), now a wholly owned subsidiary of Vistagen, prior to Vistagen's acquisition of Pherin in February 2023.

P-8.

Relationships between estrogen, menopause, and genetic risk for Alzheimer's disease in the frame of neural network dynamics and emotional memory performance

Hannah Ballard, Doctor of Philosophy, Madelyn Castro, Bachelor of Science, Lorena Ferguson, Master of Arts, Ashwathi Nair, Bachelor of Science, Alexis Bailey, Bachelor Degree, Stephanie Leal, Doctor of Philosophy. Rice University, Houston, TX

Objective: Given substantial evidence of an interaction between menopause and Alzheimer's disease (AD), interrogating the linkage between endocrine aging and risk for AD is critical for uncovering biological factors that may elicit distinct aging trajectories between sexes. However, work on brain-behavior responses during menopause is lacking, especially in the context of early AD when pathology begins to develop decades prior to clinical symptom onset, thus overlapping with the midlife transition to menopause. To correct this imbalance, our project examined effects of estrogen decline with menopause on emotional memory and neural network dynamics in cognitively normal females that carry genetic risk for AD, indexing the preclinical phase. **Design:** Genetic risk for AD was determined via allele status for the apolipoprotein (ApoE) gene, where the presence of 1-2 E4 alleles is linked to a 3- to 12-fold increase in risk for the disease while the absence of E4 is associated with null risk. We used salivary assays to identify 17β-estradiol (17β-E) levels and ApoE4 status in pre- and post-menopausal females ages 35+. This method is comparable to blood-derived measures for detecting sex hormones

and allele combinations and was not used to classify stage. Reproductive stage was classified using menstrual cycle characteristics and the Stages of Reproductive Aging Workshop (STRAW+10) criteria. Post-menopause was defined as 1+ years since final menstrual period and reproductive as <7 days difference between cycle lengths with regular menses. We administered a mnemonic discrimination paradigm during high-resolution functional magnetic resonance imaging (fMRI) to assess emotional memory and activity within the medial temporal lobe network as both are sensitive to age-related decline and impacted early on in the course of AD. We excluded those with a recent or current history of hormone therapy or contraceptives use, oophorectomy or hysterectomy, endocrine conditions, pregnancy, neurological disorders, and psychiatric or vascular conditions not pharmacologically controlled, to examine normative endocrine aging and natural menopause. Cognitive normality was confirmed by scores on the standard Mini-Mental State Exam. **Results:** We observed a predictive effect of 17β-E on emotional memory performance via the lure discrimination index (LDI), a detailed memory measure that estimates ability to discriminate between similar yet distinct stimuli, where higher 17β-E was associated with better memory. Further, a trending effect of ApoE4 status was present; the positive association between 17β-E and LDI appeared blunted in those with increased AD risk (i.e., E4 carriers). Relative to reproductive females, postmenopausal females demonstrate reduced performance in terms of LDI, particularly for negatively-valenced stimuli, whereas memory for neutral or positive stimuli remained consistent across stages. Notably, these relationships were not observed with target recognition (d'), a more standard and general memory measure. Upcoming analyses incorporating fMRI results may reveal underlying neurological contributions to these outcomes. **Conclusion:** The effects of estrogen decline with menopause were observed in our sample using a detailed memory measure that is sensitive to age-related decline and AD (i.e., LDI). This connection is most pronounced for negative stimuli, compared to positive or neutral valences. However, such differences are absent for a general memory measure that is commonly used in aging paradigms (i.e., d'), suggesting that nuanced cognitive measures, such as LDI, may serve as precise behavioral correlates of memory impairment in menopause. This work is subject to a few limitations, including the cross-sectional design and use of salivary correlates for hormone levels, though both are valuable in establishing foundational relationships for an initial perspective on this topic. Probing the impact of menopause in normative aging during the same timeframe that AD pathology first appears may provide a novel approach towards early detection of the disease, which is crucial for intervening ad slowing disease progression to improve quality of life for aging females.

Sources of Funding: National Institute on Aging (F32AG081117)

P-9.

The Associations of Menopause Symptoms, Mental Health, Self-esteem, and Sexual Satisfaction in Perimenopause and Menopause Women in Puerto Rico

Bárbara Barros-Cartagena, Psychology Doctorate (PsyD)[1,2], Caleb Esteban, PhD[1,2], Angelis Samalot-Vélez, B.A.[1], Verónica López-Rodríguez, M.S.[1], Annelyn Torres-Reverón, PhD[3], Idhaliz Flores-Caldera, PhD[3,2]. [1]School of Behavioral and Brain Sciences, Ponce Health Sciences University, Yauco, PR; [2]Ponce Research Institute, Ponce, PR; [3]Basic Sciences, Ponce Health Sciences University, Ponce, PR

Objective: This study aimed to explore the associations between the expression of menopause symptoms, and levels of depression, anxiety, self-esteem, and sexual satisfaction in Puerto Rican women during perimenopause and menopause. **Design:** We used a secondary analysis of a quantitative method with an exploratory design, with a sample of 147 Puerto Rican women aged 40-60. Several instruments were used: the Menopause Rating Scale, the Generalized Anxiety Disorder Scale, the Patient Health Questionnaire, the Rosenberg Self-esteem Scale, and the Subjective Sexual Satisfaction Scale. **Results:** The Pearson correlation analysis that was performed suggested significant positive correlations between the expression of menopause symptoms and levels of depression (r=.675, p=<.001), anxiety (r=.604, p=<.001), and significant negative correlations with self-esteem (r=-.407, p=<.001), and sexual satisfaction (r=.-457, p=<.001). Although it was reflected that the greater expression of menopause symptoms decreases self-esteem and sexual satisfaction, the most significant association with menopause symptoms is with mood symptoms. **Conclusion:** Consistent with previous literature, the results show how the experience of menopause symptoms can be associated with other essential facets of a woman's life, such as mental and sexual health. Given the limited literature on menopause in Puerto Rican women, these results contribute to establishing the foundations for future projects that allow us to understand the experience of Puerto Rican women, identify particular needs, and promote well-being during perimenopausal and menopausal stages.

Sources of Funding: This project is part of a pre-pilot study funded by RCMI START CORE Grant MD007579-35.

P-10.

Efficacy of Estetrol (E4) for Menopausal Vasomotor Symptoms: Results from a Phase 3 Randomized, Double-Blind, Placebo-Controlled Tria

Amanda Black[6], Melanie Taziaux[1], Rogerio A. Lobo[2], Ulysse Gaspard[3], Ekta Kapoor[4], Wulf Utian[5], Jean-Michel Foidart, MD, PhD[3,1]. [1]Estetra SRL, an affiliate company of Mithra Pharmaceuticals, Liège, Belgium, Liege, Belgium; [2]Columbia University Irving Medical Center, New York, NY; [3]University of Liège, Liege, Belgium; [4]Mayo Clinic, Rochester, MN; [5]Case Western Reserve University School of Medicine, Cleveland, OH; [6]University of Ottawa, Ottawa, ON, Canada

Objective: Estetrol (E4) is a promising treatment for menopausal vasomotor symptoms (VMS). E4 exhibits tissue-specific actions due to its agonistic effect on nuclear estrogen receptors (ER) and antagonistic effect on membrane ER. It has limited impact on hemostasis parameters and breast tissue and a potential benefit on lipids and glucose metabolism and bone turnover. Phase 2 and 3 studies demonstrated efficacy and overall safety of E4 for VMS treatment in postmenopausal (PM) women. Here, we present the results from a Phase 3 trial evaluating E4's efficacy in alleviating moderate to severe VMS in PM in the US/Canada. **Design:** A placebo-controlled, double-blind, multicenter, randomized study (E4Comfort II - NCT04090957) was conducted to evaluate the efficacy and safety of E4 for treatment of moderate to severe VMS in PM women aged 40-65 years. The study included hysterectomized and non-hysterectomized subjects who experienced ≥7/day or ≥50/week moderate to severe VMS in the week before randomization. Subjects were randomized to one of three arms to receive either E4 or placebo daily for 12 weeks (E4 15 mg, n=192; E4 20 mg, n=193; or placebo, n=194). Efficacy was assessed by mean change from baseline (CFB) in the frequency and severity of moderate to severe VMS at weeks 4 (W4) and 12 (W12) compared to placebo, based on daily diary reports (co-primary efficacy endpoints). Responder analysis (secondary efficacy endpoint) evaluated the proportion of subjects with ≥50% and ≥75% reduction in the weekly frequency of moderate to severe VMS at W4 and W12. Statistical analyses on CFB were conducted using Mixed Model for Repeated Measures. Differences in responder rates were analyzed with the Chi square test. **Results:** VMS frequency and severity with treatment are presented in Table 1. There was a significant reduction in the frequency of moderate to severe VMS from baseline to W4 and W12 in both E4 groups compared to placebo. There was a significant reduction in severity of VMS in the E4 20 mg group compared to placebo at W4 and W12. Responder analysis showed that majority of E4 treated participants experienced ≥50% reduction in the frequency of VMS by W4 (51.5% for E4 15 mg, 53.6% for E4 20 mg and 44.1% for placebo) with a further reduction by W12 (81.3% [p=0.001] for E4 15 mg, 81.7% [p<0.001] for E4 20 mg, 61.3% for placebo). Compared to placebo, significantly more subjects in the E4 20 group experienced a ≥75% reduction in VMS frequency at week 4 (29.1% for E4 20 mg vs 17.9% for placebo, p=0.013) and at week 12 (56.9% vs 37.3%, p=0.0007). E4 15 mg showed a significant difference in subjects reporting ≥75% reduction in VMS frequency at W12 compared to placebo (49.0%, p=0.0392). **Conclusion:** E4 15 mg and 20 mg significantly reduces the frequency of VMS compared to placebo by week 4 with ongoing and further reductions up to week 12. E4, reduced frequency and severity of VMS in the US and Canadian population and offers a promising new treatment option for symptomatic PM women.

Sources of Funding: The study was funded by Estetra SRL, an affiliate company of Mithra Pharmaceuticals, Liège, Belgium.

CFB for Weekly Frequency and Severity of Moderate to Severe VMS

Visit	E4 15 mg (N=192)		E4 20 mg (N=193)		Placebo (N=194)
	LS mean CFB (95% CI)	p-value*	LS mean CFB (95% CI)	p-value*	LS mean CFB (95% CI)
Frequency					
W4	-41.38 (-46.44, -36.32)	0.0436	-43.17 (-48.24, -38.09)	0.0117	-32.96 (-38.20, -27.71)
W12	-57.54 (-62.73, -52.34)	0.0029	-60.82 (-66.09, -55.56)	0.0001	-45.33 (-50.79, -39.88)
Severity					
W4	-0.60 (-0.70, -0.50)	0.7786	-0.73 (-0.83,-0.63)	0.0310	-0.56 (-0.66, -0.46)
W12	-0.81 (-0.91, -0.71)	0.7941	-1.12 (-1.22, -1.02)	<.0001	-0.77 (-0.88, -0.67)

LS: Least Squares, *vs placebo

P-11.

Relationships Between Emotion Regulation Strategies and Subjective and Objective Sleep Outcomes in Midlife Women

Adoma Boateng[1], Karen Jakubowski[1], Pauline Maki[2], Rebecca Thurston[3]. [1]Psychiatry, University of Pittsburgh, Pittsburgh, PA; [2]Psychiatry, Psychology and OB/GYN, University of Illinois, Chicago, IL; [3]Psychiatry, Psychology, and Epidemiology, University of Pittsburgh, Pittsburgh, PA

Objective: Emotion regulation strategies include changing how one thinks about a situation to feel a more positive emotion (cognitive reappraisal) and inhibiting behavioral expressions of emotion (expressive suppression). Cognitive reappraisal is associated with better sleep outcomes (better sleep quality and shorter sleep onset latency), while expressive suppression is linked to worse sleep in the general population. Few studies have examined longitudinal associations between emotion regulation and sleep among midlife women using objective measures. Midlife is a particularly important time for sleep among women given the occurrence of the menopause transition. We tested whether emotion regulation strategies were related to changes in self-reported and actigraphic sleep in midlife women over two assessments separated by five years. **Design:** 167 women aged 40-60 at baseline (mean age = 53.91) were assessed at two time points five years apart. At both time points, women self-reported demographics, emotion regulation strategies (Emotion Regulation Questionnaire), sleep quality (Pittsburgh Sleep Quality Index; PSQI), sleep apnea symptoms, and depression and anxiety symptoms; provided medical history and physical measures; and completed a three-day actigraphy sleep assessment [minutes of sleep latency and wake after sleep

onset (WASO), sleep efficiency (%), total sleep time (hours)]. Associations between emotion regulation (cognitive reappraisal, expressive suppression) at baseline with change in sleep outcomes [latency, efficiency, duration, WASO, PSQI] across visits were tested in linear regression models. Covariates included age, race/ethnicity, education, body mass index, nightshift work, sleep apnea symptoms, and medication use (for sleep, depression, anxiety symptoms). **Results:** Greater cognitive reappraisal was related to increased sleep efficiency over five years [B(SE)=-0.01(0.005), p=0.03, multivariable]. Greater expressive suppression was associated with increased sleep latency over five years [B(SE)=0.04(0.02), p=0.05, multivariable]. Emotion regulation was not significantly related to change in duration, WASO, or subjective sleep quality. **Conclusion:** Greater cognitive reappraisal is associated with improved sleep efficiency and increased expressive suppression is associated with prolonged sleep latency over midlife. Adaptive emotion regulation strategies may help promote healthy sleep among midlife women as they age.

Sources of Funding: R01HL105647, R01AG053504, 2K24HL123565

P-12.

Effects of conjugated estrogen and bazedoxifene (CEB) on depressive symptoms and limbic resting state functional connectivity in perimenopausal depression: Results from a pilot clinical trial

Erin Bondy, Megan Hynd, Gabriel Dichter, Julianna Prim, David Rubinow, Crystal Schiller. University of North Carolina School of Mecidine, Durham, NC

Objective: The menopause transition ("perimenopause") is characterized by irregular ovarian hormone fluctuations and associated with elevated risk for depression. Perimenopausal-onset major depression (PO-MDD) can be alleviated with estrogen treatment. However, due to potential risk for breast and uterine cancer, many women are discouraged from estrogen treatment or must take adjunctive progesterone, which increases risk of breast cancer and can negatively impact mood. A tissue selective estrogen complex (TSEC) combines conjugated estrogen with a selective estrogen receptor modulator (SERM), such as bazedoxifene, which serves to protect the endometrium and breast without the need for concurrent progesterone. The effect of conjugated estrogen and bazedoxifene (CEB) on mood and related neural activation remain unknown. In this open-label pilot clinical trial, CEB was administered to assess symptom trajectories and resting state functional connectivity (rsFC) measured using functional magnetic resonance imaging (fMRI). **Design:** Participants with PO-MDD (n=10) completed baseline and post-treatment eight-minute resting state fMRI scans, three weeks of daily oral CEB, and weekly mood assessments using the Inventory of Depression and Anxiety Symptoms (IDAS). Low mood was assessed using the Dysphoria scale, and anhedonia was assessed using the reverse-scored Wellbeing scale. The CONN Toolbox was used to assess treatment-related seed-to-voxel changes in rsFC, with 15 a priori seeds selected within salience network regions. Multilevel mixed models examined the effect of time and rsFC on Dysphoria and Anhedonia. **Results:** Dysphoria (β=-0.65, 95%CI [-0.85, -0.45], p<.001) and Anhedonia (β=-0.48, [-0.73, -0.23], p<.001) significantly decreased over the course of the treatment. Treatment effects revealed increased rsFC between the right amygdala seed and right orbitofrontal cortex (MNIxyz: +20 +18 -30, k=38, p_{FDR}<.001). Changes in rsFC were not associated with changes in Dysphoria (β=-0.04, [-0.40, 0.32], p=.83) or Anhedonia (β=0.05, [-0.52, 0.63], p=.85). **Conclusion:** Safety considerations and side effect profiles contribute to limitations of traditional estrogen treatment for PO-MDD. The current findings suggest that CEB reduces mood symptoms and targets neural connectivity without the standard hormone therapy-associated risk profile. However, clinical symptom reduction was not linked to increased rsFC within a three-week course of treatment. Additional research is needed to confirm these findings in a larger sample with more power to determine how changes in brain connectivity may impact mood and behavior and the potential for CEB to be an additional antidepressant option for PO-MDD.

Sources of Funding: Foundation of Hope (CS), R01MH128238 (GD, CS)

P-13.

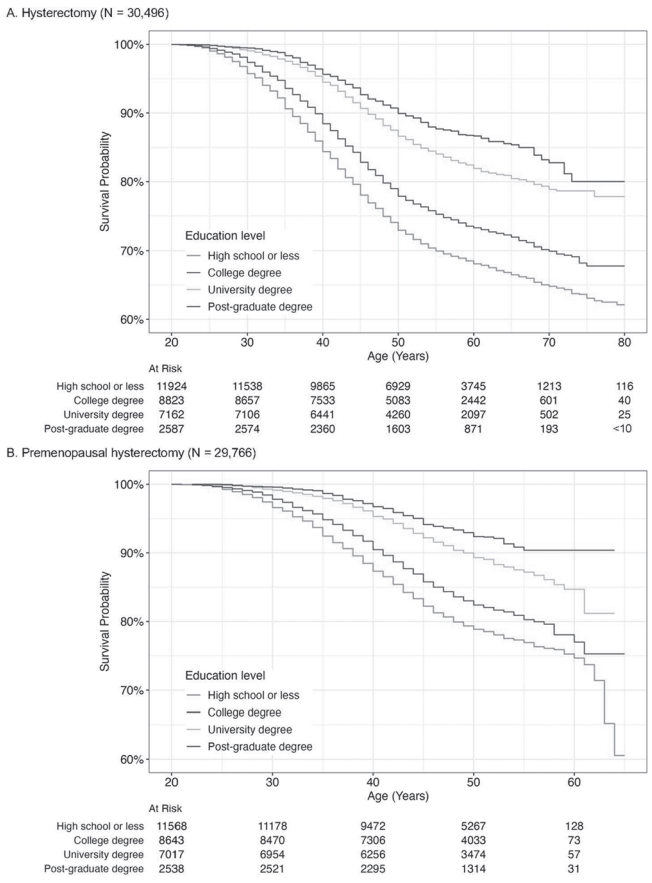
Education level is associated with the occurrence and timing of hysterectomy: A cohort study of Albertan women

Erin A. Brennand, MD, MSc, Natalie V. Scime, PhD, Beili Huang, MSc, Pauline Hull, PGCE, PGDip(BJTC). Obstetrics & Gynecology, University of Calgary, Calgary, AB, Canada

Objective: Hysterectomy is a common surgery with discernible practice variations that could be influenced by socioeconomic factors. We examined the association between level of educational attainment and the occurrence and timing of hysterectomy in Albertan women. **Design:** We conducted a prospective cohort study of 30,496 females in the Alberta's Tomorrow Project (2000–2015) followed approximately every 4 years using self-report questionnaires. Educational attainment was defined as high school diploma or less, college degree, university degree (reference group), and post-graduate degree. We used logistic regression analyzing hysterectomy occurrence any time and before menopause, separately, and flexible parametric survival models analyzing hysterectomy timing with age as the time scale. Multivariable models controlled for race/ethnicity, rural/urban residence, parity, oral contraceptive use, and smoking. **Results:** Overall, 39.1% of females reported a high school diploma or less, 28.9% reported a college degree, 23.5% reported a university degree, and 8.5% reported a post-graduate degree. A graded association was observed between lower education and higher odds of hysterectomy (high school or less: adjusted odds ratio [AOR] 1.88, 95% CI 1.73-2.04; college degree: AOR 1.60, 95% CI 1.47-1.74); results were similar for premenopausal hysterectomy. A graded association between lower education and earlier timing of hysterectomy was also observed up to approximately age 60 (for example, at age 40: high school or less adjusted hazard ratio [AHR] 1.70, 95% CI 1.58-1.85; college degree AHR 1.53, 95% CI 1.41-1.67). **Conclusion:** Women with lower levels of education were more likely to experience hysterectomy, including hysterectomy before menopause and at younger ages.

Sources of Funding: This work was conducted as part of the Alberta Sex, Gender and Women's Health Hub, which is funded by the Canadian Institutes of Health Research and Women and Gender Equality Canada through the National Women's Health Research Initiative: Coalition-Hubs competition (Grant # 494449).

Figure 1: Kaplan-Meier survival curves of hysterectomy and premenopausal hysterectomy by education level



P-14.

A portfolio analysis of NIH-funded awards for the study of the menopausal transition and menopausal symptoms

Annina Burns, PhD, RD, Elizabeth Barr, PhD, Miya Whitaker, PhD, John Yeh, MD, Sarah Temkin, MD. ORWH, National Institutes of Health, Bethesda, MD

Objective: The NIH is the largest biomedical research funder in the world. The objective of this study was to identify NIH-funded awards that explicitly studied the menopausal transition (MT) and or menopausal-associated symptoms from FY2013 to FY2022 to inform the identification of future research areas and opportunities for collaboration. **Design:** The NIH Office of Portfolio Analysis' iSearch module was used to identify all MT or menopausal symptom awards made from FY2013-FY2022. The iSearch module includes over 5.6 million funded and unfunded applications from NIH and other HHS components. The search term strategy consisted of key menopause terms, with a minimum of two terms required for inclusion in results. The search included terms associated with menopausal symptoms, e.g., hot flashes, vasomotor symptoms, sleep disturbance as well as keywords associated with menopause including hormone replacement therapy, ovarian aging, and anti-mullerian hormone (AMH). To ensure inclusion of studies focused on surgical menopause, we also added ovariectomy and oophorectomy to the search terms. Initial results were screened through a multi-step process. First, unfunded applications were excluded. Second, duplicates were removed (e.g., subsequent years of a multi-year grant). Third, reviewers manually screened the title, abstract and specific aims and coded the awards for relevance to the specific study of MT or menopausal symptoms. **Results:** Across ten fiscal years of 2013-2022, 636 unique awards met the full initial screening inclusion criteria. Of these, 141 were categorized as MT or menopausal symptom specific awards for a total of $232 million in spending. Multiple NIH Institutes and Centers (ICs) funded awards (16 of the 27 ICs). The National Institute on Aging (NIA) was the largest funder of menopause focused awards in this period at 57% of all awards (n=81 of 141),

followed by the National Institute of Mental Health (NIMH) at 7% (n=10), then National Institute of Environmental and Health Sciences (NIEHS) at 6% (n=9). The following health conditions or topics were the most frequently addressed: Alzheimer's disease, dementia, cognitive decline, cognitive dysfunction, inflammation, cardiovascular diseases (CVD), and vasomotor symptoms. Most menopause-related research (72%) was extramural; 14% was intramural; 11% supported training; and 3% was categorized as other. Little variation in funding by year was identified across the study period. All awards analyzed were based on manual coding. **Conclusion:** This study provides insight into the NIH portfolio of MT and menopausal symptom awards across the study period. Due to the small sample size, we could not identify trends in NIH awards; however, this study enhances our understanding of historical patterns in funding. We did identify that most MT and menopausal symptom research was tied to specific diseases, particularly those associated with cognitive decline. Opportunities exist to support research on the pathogenesis, diagnosis and treatment of menopausal symptoms, as well as interventions to improve quality of life and promote healthy aging during the menopause transition.
Sources of Funding: None

P-15.

Examining the Role of Protein Intake on Skeletal Muscle Mass in Postmenopausal Women

Hannah Cabre, Kara Marlatt, Steven Heymsfield, Leanne Redman. Pennington Biomedical Research Center, Baton Rouge, LA

Objective: Sarcopenia is the involuntary loss of skeletal muscle (SM) mass and function that occurs with age and is more prevalent in women following menopause. Therefore, identifying a nutrition intervention that target SM is important for supporting physical function, optimal health, and muscle quality in aging women. Dietary protein intake higher than the recommended daily amount may lead to smaller decreases in SM. The purpose of this study was to examine the role of relative protein intake (PRO) on SM mass in postmenopausal women. A secondary aim was to assess the impact of protein oxidation on SM mass in a subgroup of participants. **Design:** In a cross-sectional analysis of a prospective cohort study (the Healthy Transitions study), 86 healthy females (age: 53.4±4.7 yr; BMI: 27.0±5.9 kg/m^2) who were ≥43 yrs and had a BMI 20-40 kg/m^2 were evaluated at the onset of menopause (amenorrheic for ≥12 consecutive months). Average daily dietary protein intake was determined from a 3-day food record. PRO was evaluated by dividing protein intake (g) by body mass (kg). Participants were stratified by high PRO or low PRO as determined by daily protein consumption above or below 0.9 g/kg/d, respectively. Body composition was assessed via a dual energy x-ray absorptiometry (DXA) scan to estimate fat mass (FM; kg), percent body fat (%BF), and FFM (kg). The FFM and height were used to calculate FFM index (kg/m^2) to assess relative FFM. A validated prediction model was used to estimate SM (kg) from appendicular lean mass, the sum of DXA arm and leg lean mass measures, as follows: 1.12×ALM–0.67. A subgroup of participants (n=27) underwent 24-hr whole-room calorimetry assessment of 24-hour energy expenditure (EE) and protein oxidation. Independent t-tests were used to examine group differences. **Results:** Outcome variables for the total sample are presented in **Table 1**. Participants with high PRO (n=43) had a greater intake of calories (mean ± standard error [high PRO-low PRO]: 255±76 kcal/d) and protein (24±3 kcal/d) compared to participants with low PRO (n=43). In participants with high PRO, weight, BMI, %BF, and FM were significantly lower than those with low PRO (p=0.004-<0.001). However, those with high PRO also demonstrated lower FFM (-2.8±1.0 kg) and SM (-1.6±0.7 kg), while FFM index was similar between groups (-0.5±0.4 kg/m^2). In the subgroup of participants, although there were no differences in 24-hr EE (p=0.684), protein oxidation was increased in the high PRO group (13±11 g/d), while not significant. **Conclusion:** Despite an increase in calories and protein intake, participants with high PRO demonstrated lower absolute values of SM and FFM. These findings suggest that changes in substrate metabolism, particularly protein oxidation, may impact SM retention in postmenopausal women. While increased PRO may be beneficial for body composition changes such as lower %BF and FM, it does not appear to be enough to compensate for increased PRO oxidation, which may lead to the involuntary loss of SM (e.g. sarcopenia). As the use of 3-day food records to assess dietary intake was a limitation of the present study, examining the role of high PRO intake through dietary provision in a clinical trial may aid in elucidating mechanisms related to changes in substrate metabolism in SM. Identifying potential adjuvant therapies to attenuate the reduction in SM as women traverse menopause has the potential to shift the standard of care for postmenopausal women.
Sources of Funding: These data were supported by the NIH (R01 DK050736).

Table 1. Total sample outcome variables presented as mean ± standard deviation

Body Composition (n=86)		P-Values High PRO vs Low PRO
%BF	40.8 ± 8.3	0.004
FM (kg)	30.3 ± 11.9	<0.001
FFM (kg)	41.6 ± 4.8	0.007
SK (kg)	18.2 ± 3.1	0.017
FFM Index (kg/m2)	15.5 ± 1.8	0.182
Dietary Intake (n=86)		
Calories (kcal/d)	1550.8 ± 372.7	0.001
Protein (g/d)	65.7 ± 19.0	<0.001
PRO (g/kg/d)	0.9 ± 0.3	<0.001
CHO (g/d)	190.0 ± 62.4	0.059
Fat (g/d)	58.8 ± 22.2	0.083
24-Hour Chamber (n=27)		
24-hour EE (kcal/d)	1894 ± 204	0.681
Protein Oxidation (g/d)	91 ± 28	0.229
CHO Oxidation (g/d)	232 ± 58	0.421
Fat Oxidation (g/d)	55 ± 27	0.606

CHO=Carbohydrate

P-16.

A Vaginal Hygiene System for Management of Bacterial Vaginosis and Vaginal Health in Pre- and Post-Menopausal Women

Kimberly Capone, PhD[1], Beth DuPriest, PhD[1], Shanya San[1], Susan Kellogg-Spadt, PhD[2], Terry Morgan, MD, PhD[4], Marcela Riveros Angel, MD[4], Tamutenda Chidawanyika, MD, PhD[5], Cathy Chung Hwa Yi, MD[6], Wendy Strgar[3]. [1]Research & Development, Vaginal Biome Science, Lambertville, NJ; [2]Female Sexual Medicine at the Center for Pelvic Medicine, Bryn Mawr, PA; [3]Vaginal Biome Science, Portland, OR; [4]Pathology, Oregon Health and Science University, Portland, OR; [5]Department of Obstetrics and Gynecology, Yale University School of Medicine, New Haven, CT; [6]Dartmouth Hitchcock Clinics Specialty Care, Bedford, NH

Objective: Bacterial vaginosis (BV) remains a significant challenge in menopausal women, where physiological changes from the genitourinary syndrome of menopause (GSM) result in an increased vaginal pH and shifts in the vaginal microbiota. Recent studies reveal BV prevalence rates ranging between 2%-57% among postmenopausal women, often complicated by diagnostic challenges due to the physiological changes of menopause and the similarity with BV symptoms. Traditional diagnostic methods for BV may be inadequate to determine BV prevalence in this group, as most were validated predominantly in premenopausal populations. Current data suggest significant differences in the vaginal microbiota of postmenopausal women compared to their premenopausal counterparts, which may influence disease presentation and management. The ability to manage vaginal pH is particularly critical in this demographic, as elevated pH is a risk factor for the development of BV as well as the acquisition of other vaginal infections. **Design:** We conducted three longitudinal pilot studies enrolling pre- and post-menopausal women aged 17-68 with recurrent BV following their use of a novel vaginal hygiene system comprising a vulvar wash, a vaginal lactic acid gel, and a probiotic suppository over periods of 11 to 24 weeks. Assessments included changes in vaginal pH, BV recurrence rates determined through clinical and microbiome testing, Nugent scores, and self-reported symptoms. **Results:** The intervention led to a statistically significant reduction in vaginal pH across all studies. Vaginal pH was assessed at baseline, week 11 (Study 1) and week 24 (Studies 2 and 3). In Study 1, vaginal pH fell from 4.56 ± 0.15 at baseline to 4.00 ± 0.12 at Week 11 (P=0.021). In Studies 2 and 3, vaginal pH fell from 4.66 ± 0.21 at baseline to 4.08 ± 0.13 at 12 weeks and remained lower at 4.33 ± 0.097 at 24 weeks (P=0.0135). Application of the vaginal hygiene system was associated with reduced BV recurrence rates (7.7% in the first pilot study and 17.6% in subsequent studies), even in the absence of microbiome community shifts. Importantly, the intervention ameliorated symptoms of vaginal discomfort, indicating an improved vulvovaginal health state associated with a reduction in vaginal pH. These outcomes highlight the potential of this hygiene system to modify the vaginal environment by lowering the pH to support the health of the vaginal microbiome. Indeed, biofilm formation by the BV-associated bacterium (BVAB) *Gardnerella vaginalis* is enhanced at pH 5 to 6.5, the typical vaginal pH range during BV. A higher vaginal pH is thought to potentiate *G. vaginalis* adhesion to the vaginal epithelia and result in less interference by *Lactobacillus* species. *Gardnerella* biofilm formation is the foundation for other BVAB to colonize and facilitates the BV-associated microbial communities that are associated with BV. In contrast, lower pH (<4.5) typically seen in lactobacilli-dominant states result in weak *Gardnerella* biofilms in vitro. **Conclusion:** Based on the findings in these pilot studies, the use of a vaginal hygiene system has demonstrated promise in supporting optimal vaginal health and managing recurrent BV in pre- and post-menopausal women. By lowering vaginal pH and supporting a health-associated vaginal environment, this approach addresses a critical gap in the management of BV, particularly in menopause, where the lack of estrogen is already associated with an elevated vaginal pH. This strategy is crucial for creating a vaginal environment less susceptible to pathogens and more supportive of lactobacilli and their metabolism, directly addressing the challenges posed by the increased vaginal pH typically seen in menopause. Further research is warranted to explore the longer-term effects of the hygiene system and to refine diagnostic and management strategies for BV in the menopausal demographic.
Sources of Funding: none

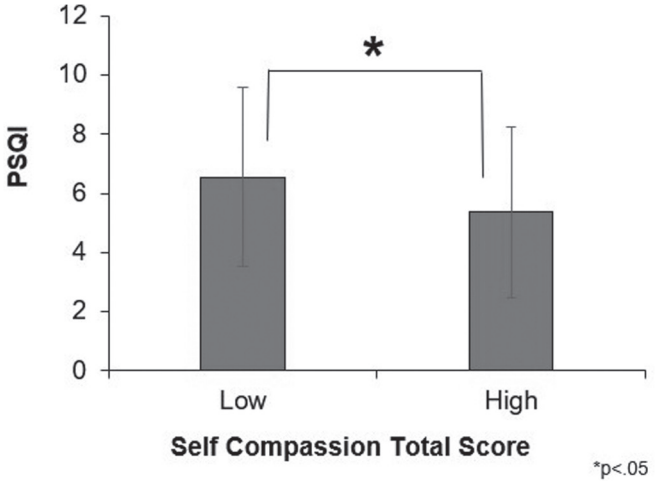
P-17.

Associations Between Self-Compassion and Sleep Among Midlife Women

Alana J. Castle, B.S.[1], Mary Y. Carson, M.S.[2], Karen Jakubowski[1], Caitlyn Johnson[1], Abby Clay[1], Pauline Maki, PhD[3], Rebecca Thurston[1,2]. [1]Psychiatry, University of Pittsburgh, Pittsburgh, PA; [2]Psychology, University of Pittsburgh, Pittsburgh, PA; [3]Psychiatry, University of Illinois at Chicago, Chicago, IL

Objective: Sleep quality plays a critical role in health. Positive psychological states, such as self-compassion, may be associated with improved sleep quality. Self-compassion is characterized by being mindful of one's moment-to-moment experience and treating oneself with kindness and compassion. Self-compassion may also be associated with better mental health, which in turn may have implications for sleep. We tested whether greater self-compassion was associated with subjective sleep among midlife women. We also considered the role of depressive symptoms in these associations. **Design:** Participants were 274 women aged 45-67. Women completed validated measures of self-compassion (Self-Compassion Scale-Short Form), sleep quality (Pittsburgh Sleep Quality Index), insomnia symptoms (Insomnia Severity Index), and depressive symptoms (Center for Epidemiological Studies-Depression); reported medical history and medication use via interview; and provided physical measures of height/weight (body mass index;BMI). Relations between self-compassion and subjective sleep (greater sleep quality, lower insomnia symptoms) were assessed in separate linear regression models, adjusting for age, race/ethnicity, education, sleep apnea symptoms, sleep medication use, and vasomotor symptoms. Depressive symptoms were evaluated as a mediator using the products of coefficients method. **Results:** Women were on average 59 years old; 99% postmenopausal; 78% identified as white, 18% Black, 2% Asian or Pacific Islander, and 2% Multiracial. Women who reported greater self-compassion had better sleep quality [B(SE)=-0.03(.006), p<0.001, multivariable] and fewer symptoms of insomnia [B(SE)=-0.22(.08), p=.007, multivariable] and depression [B(SE)=-0.11(.01), p<0.001, multivariable] (Figure 1). Depressive symptoms were a significant mediator of associations between self-compassion and sleep quality or insomnia, such that 70%-82% of the relationship between self-compassion and sleep outcomes was explained by lower depressive symptoms among women with higher self-compassion. **Conclusion:** Greater self-compassion was associated with better sleep quality and fewer insomnia and depressive symptoms, after adjusting for confounders. Future research should test whether interventions to enhance self-compassion can improve mental health and sleep among midlife women, and clinicians may consider approaches that enhance self-compassion when treating poor sleep and depression in midlife women.

Sources of Funding: NIH grants RF1AG053504 and R01AG053504(Thurston & Maki); K24HL123565(Thurston)



P-18.

Menopause and COVID-19 among Women Living with HIV

Emily M. Cherenack, PhD[1], Deborah L. Jones, PhD[1], Suresh Pallikkuth[1], Yue Pan[1], JoNell Potter[1], Lydia Fein[1], Ana S. Salazar[1], Nicholas F. Nogueira[1], Jamie Dickerson[1], Mirjam-Colette Kempf[2], Adhar Mohamed[1], Caitlin Moran[3], Michelle Floris-Moore[4], Elizabeth Topper[5], Mardge Cohen[6], Phyllis Tien[7], Seble Kassaye[8], Howard Minkoff[9], Anjali Sharma[10], Helen Cejtin[11], Maria L. Alcaide[1]. [1]University of Miami, Miami, FL; [2]University of Alabama at Birmingham, Birmingham, AL; [3]Emory University, Atlanta, GA; [4]University of North Carolina at Chapel Hill, Chapel Hill, NC; [5]Johns Hopkins University, Baltimore, MD; [6]University of Illinois Chicago, Chicago, IL; [7]University of California, San Francisco, San Francisco, CA; [8]Georgetown University, District of Columbia, DC; [9]State University of New York Downstate, Brooklyn, NY; [10]Albert Einstein College of Medicine, Bronx, NY; [11]Stroger Hospital of Cook County, Chicago, IL

Objective: The menopausal transition has been associated with more severe COVID-19. Some studies show that women living with HIV (WLWH) experience menopause earlier and have more severe menopause symptoms than women without HIV. Menopause, COVID-19, and HIV all heighten inflammation. Menopause and COVID-19 may present with certain overlapping symptoms, such as aches or fatigue. Despite the potential health impacts of these co-occurring conditions and the possibility of some overlapping symptoms, little is known about the associations between menopause and COVID-19 among WLWH. This study describes the frequency of COVID-19 infection and COVID-19 symptoms across menopause stage and the relationship between COVID-19 infection and menopause symptoms among WLWH. **Design:** From 2020 to 2022, cross-sectional survey data were collected from WLWH across the US as part of the MACS/WIHS Combined Cohort Study. Women under 45 years-of-age or with conditions that would interfere with the detection of natural menopause were excluded. Menopause stage (pre, peri, and postmenopause) was determined via self-report of menopause and last menstrual period and validated by assessing the frequency of more specific (e.g., hot flashes) and less specific (e.g., sleep disruption) menopause symptoms across stage. Self-reported COVID-19 testing/infection (i.e., never tested, tested negative, tested positive) and COVID-19 vaccination were compared across menopause stage and in relation to menopause symptoms. Women with a prior positive COVID-19 test were asked about COVID-19 symptoms during their most recent infection. The association of menopause stage with the presence of individual COVID-19 symptoms was assessed using a (1) two-group comparison (pre/perimenopause vs. postmenopause), (2) a two-group comparison controlling for age and COVID-19 vaccination, and (3) a three-group comparison (premenopause vs. perimenopause vs. postmenopause). **Results:** Participants (n=880) were 72% Black and 16% Hispanic, with a mean age of 57 yrs; 138 (16%) were categorized as premenopausal, 59 (8%) as perimenopausal, and 683 (78%) as postmenopausal. As expected, women in perimenopause were most likely to have hot flashes (33% pre, 59% peri, 43% post; p<.001) and night sweats (28% pre, 44% peri, 31% post; p=.05). The non-specific menopause symptom of "waking too early" was more common among WLWH with prior COVID-19 infection (60% among COVID+, 46% among COVID-, 45% among never tested; p=.01), but did not differ by menopause stage. Neither self-reported COVID-19 infection nor vaccination was associated with menopause stage. Among the 78 (9%) who tested positive for SARS-CoV-2, symptoms of COVID-19 were more prevalent in perimenopause or the combined pre/peri menopausal stage compared to the postmenopausal stage for aches (78% pre/perimenopause vs 43% postmenopause), fatigue (83% vs. 45%), sore throat (61% vs 25%), and loss of smell (67% vs 25%). Associations persisted when controlling for vaccination and age, which were not associated with COVID-19 symptoms. **Conclusion:** Among WLWH testing positive for COVID-19, multiple symptoms attributed to COVID-19 were more common in women in perimenopause. Overlap between similar menopause and COVID-19 symptoms could cause diagnostic confusion in clinical and research settings. Research is needed to explore if hormonal and behavioral changes in menopause are associated with immune responses to infectious disease among WLWH.

Sources of Funding: MWCCS is funded by the NIH, including UL1-TR000004 (UCSF CTSA), P30-AI-050409 (Atlanta CFAR), P30-AI-050410 (UNC CFAR), P30-AI-027767 (UAB CFAR), and 1F32AI162229 (EMC).

P-19.

Mapping Menopause Care: Distribution and Accessibility of Menopause Society Certified Practitioners in the U.S.

Arina Chesnokova, MD MPH[1], Marilyn Schapira[1], Makeba Williams[2], Alice Abernathy[1]. [1]University of Pennsylvania, Philadelphia, PA; [2]Washington University, St Louis, MO

Objective: A significant gap in menopause care delivery has been identified, particularly noticeable since the 2000s following the release of the results of Women's Health Initiative trial. The quantification of this vacuum thus far has relied on the observation of persistently low rates of hormone replacement therapy prescribing, matched by an unfulfilled need expressed by patients in their behavior to seek help through unregulated industries of compounding pharmacies and online and app-based solutions. Yet there has been a lack of empirical research on the workforce providing menopausal care, their geographic distribution, and patient access to certified providers. This study aims to start addressing these gaps by examining the distribution of Menopause Society Certified Practitioners (MSCP) and their geographic accessibility. **Design:** This research utilized the MSCP directory and the 2022 American Community Survey (ACS) 5-year estimates at the Census Tract (CT) level. We abstracted data from all practitioners designated "MSCP" and verified their primary practice addresses through CMS and manual Google searches when discrepancies arose. Practitioners exclusively offering remote services or those unable to prescribe medications were excluded. All prescribing providers were geocoded, and a 60-minute driving radius was applied to assess geographic accessibility for populations of women ages 45-64 within each census tract. All analyses were conducted using Stata 17.0 and ArcGIS Pro 3.2. **Results:** A total of 1,001 providers were included: 74% were physicians, predominantly OBGYNs (81%). At the state level, all states had ≤0.5 MSCP clinicians per 10,000 biologically female individuals aged 45-64, except for Washington D.C. (with 1.8 per 10,000), with the majority of states having ≤0.2. After applying geocoding and the driving distance criteria, it was found that 70% of CTs were within a 60-minute drive from an MSCP provider, covering 61% of the target female population. **Conclusion:** While MSCPs are not the sole providers of menopausal care, they represent a specialized cohort within the field. Currently, there are no established benchmarks for the optimal number of subspecialty clinicians per population, but the figures for MSCPs are markedly lower compared to other specialties such as oncology (with 1.6 per 10,000). This study highlights significant disparities in access to specialized menopausal care and underscores the need for discussions on workforce development and policy reform in this area.

Sources of Funding: None

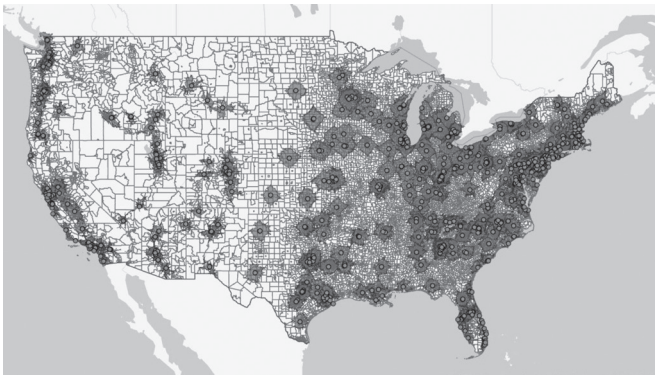


Figure 1. Menopause society certified practitioner locations with 60min drivind distance radius, overlayed over Census Tracts.

P-20.

The association of menopause with clinical cardiac risk factors: Follow up results from the Canadian Longitudinal Study on Aging

Rachel A. Gladstone, MD[1,2], Joel Ray, MD, MSc[4,2], Lindsay Shirreff, MD, MSc(HQ)[1,3], Marie Christakis, MD, MPH[1,3]. [1]Obstetrics & Gynaecology, University of Toronto, Toronto, ON, Canada; [2]Institute of Health Policy, Management, and Evaluation, University of Toronto, Toronto, ON, Canada; [3]Obstetrics & Gynaecology, Mount Sinai Hospital, M5G 1X5, ON, Canada; [4]Internal Medicine, St. Michael's Hospital, Toronto, ON, Canada

Objective: Independent of age, menopause is associated with significant changes in several cardiometabolic and vascular health parameters strongly linked to elevated cardiovascular disease (CVD) risk. Metabolic syndrome (MetS) contributes to CVD risk, yet its relation to the menopause transition is incompletely understood. This study aimed to report on the incidence of MetS across the menopause transition, and to evaluate for the first time in a Canadian population whether menopause is an independent risk factor for the development of MetS and its components. **Design:** We performed a retrospective cohort analysis of women enrolled in the Canadian Longitudinal Study on Aging (CLSA) who underwent interviews and biophysical assessments at two sequential timepoints. Participants who underwent menopause age <41 or >55 years, or whose menopause status was unknown were excluded. A mixed-model with time-varying menopause status was employed to investigate the association between menopause and MetS. **Results:** A total of 12,315 participants were included, 2,165 of which were pre-menopausal at baseline assessment, and of which 738 transitioned to menopause during the study period. The mean age of pre-menopausal women was 49.4 (SD 2.7) years, compared with 64.7 (SD 9.0) for the post-menopausal group, and approximately 93% of included participants were White. After adjustment, menopause was associated with significant increases in weight, LDL-C, HDL-C, ALT, and creatinine, and decreases in systolic blood pressure. Post-menopausal women were significantly more likely than pre-menopausal to meet criteria for MetS (adjusted OR 1.39 (95% CI 1.15-1.67)). Age of menopause was not significantly associated with a diagnosis of MetS. **Conclusion:** Menopause is independently associated with increased likelihood of MetS, which could represent an intermediate in the increased CVD risk observed among post-menopausal women.

Sources of Funding: St. Michael's Hospital Chair in Women's Health held by Dr. Sari Kives

P-21.

Assessment of a Menopause Curriculum for Practicing Primary Care Clinicians

Amanda L. Clark, MD MCR[1], Leah Brandis, MPH RDN[5], Stephanie Hyde, MA[5], Moira Ray, MD[2], Craig D. Williams, PharmD[4], Michael R. McClung, MD[6], Karen E. Adams, MD[3]. [1]Urogynecology & Reconstructive Pelvic Surgery, Oregon Health & Science University (OHSU), Portland, OR; [2]Family Medicine, OHSU, Portland, OR; [3]Obstetrics and Gynecology, Stanford University, Stanford, CA; [4]Pharmacy, Oregon State University, Corvallis, OR; [5]Oregon Rural Practice-based Research Network, OHSU, Portland, OR; [6]Oregon Osteoporosis Center, Portland, OR

Objective: The longstanding lack of menopause teaching in clinical training programs has resulted in a knowledge gap among current clinicians. We aimed to assess the curricular needs of practicing primary care clinicians by ratings of the relevance of faculty-selected curriculum topics. We also aimed to identify additional educational needs based on participant-submitted case presentations, questions, and feedback. **Design:** This is an observational, mixed method study of an educational program, deemed not human research by the IRB. The Menopause in Primary Care program is a component of Oregon ECHO (Extension for Community Healthcare Outcomes) Network (OEN), a platform for telementoring healthcare professionals in rural and under-resourced areas. The OEN began in 2017 and in 2023, offered 36 no-cost CME programs to 1200 clinicians statewide. Rural clinicians are prioritized for registration. Project ECHO® (https://projectecho.unm.edu/model/) is an evidence-based videoconferencing learning model. Its format is comprised of a 15-20-minute expert didactic by faculty followed by a real-life, HIPPA-compliant case presented by a participant. This is followed by a facilitated case discussion, soliciting questions and recommendations, aiming to foster interaction among participants and faculty. At the conclusion of the one-hour session, a written summary of the case recommendations is made available on the ECHO web portal, along with session slides, handouts, resources, and contact information. Faculty-selected topics for the didactic portion of the 8 sessions were: 1. Perimenopause 2. Vasomotor Symptoms 3. Hormone Therapy (HT) Overview 4. HT & Chronic Conditions 5. Nonhormone Therapy 6. Genitourinary Syndrome of Menopause 7. Mood Changes & Disorders 8. Skeletal Health Feedback was requested after each session via a REDCap survey. A qualitative assessment of written material--case presentations, session chats, and comments--was undertaken to identify needed additional topics. **Results:** The program was oversubscribed with 81 registrants. The 51 participants selected for participation included 24 physicians, 11 nurse practitioners, 8 physician assistants, 3 naturopaths, 1 nurse, 1 pharmacist, 1 dentist, 1 social worker and 1 faculty of public health. The practice location for 17 participants was > 100 miles distant from the state's major academic medical center and 23 participants practiced in communities with populations less than 50,000. Ratings of the presented curriculum were high (Table 1). Participants recorded anticipated changes in their practice as 1) less need to refer patients to specialists; 2) greater comfort with the clinical diagnosis of perimenopause and need for consideration of contraception as well as menopause symptoms; 4) use of risk calculators to guide care; 5) greater comfort in choosing an initial therapy and monitoring effectiveness; and 6) greater comfort with the types of estrogens and progestogens. Many participants requested more sessions to address additional topics, the most common of which are listed in Table 2. **Conclusion:** Primary care clinicians rated this menopause ECHO program highly but requested an expanded curriculum. The ECHO model is a well-established educational approach that can be successfully employed to address the menopause knowledge gap in primary care for a diverse set of health care professionals.

Sources of Funding: Oregon Rural Practice-based Research Network, OHSU Center for Women's Health

1 Mean Ratings of Weekly Sessions (1-strongly disagree to 6 strongly agree)

Content balanced and objective	5.5
Content evidence-based	5.5
Didactic presentation relevant to my practice	5.5
Case presentation relevant to my practice	5.4

Themes identified for additional curriculum topics

Sexual dysfunction-screening & management
Evaluation of abnormal vaginal bleeding
Differentiating perimenopause from PCOS
Nutrition, supplements, exercise, & lifestyle interventions
Weight management
Breast care--enhanced screening, genetic testing, mastalgia
Primary ovarian insufficiency/premature menopause
Muscle and joint pain associated with menopause
HT & coagulation disorders

P-22.

Evaluating Neighborhood Socioeconomic Disadvantage in Patients with Abnormal Pap Smears

Madeline E. Cohn, DO, Meng Yao, Sharon Sutherland, MD, MPH. Cleveland Clinic, Cleveland, OH

Objective: In the year 2023, approximately 13,960 women will be diagnosed with invasive cervical cancer and approximately 4,310 women will die from cervical cancer. New cervical cancer diagnoses represent approximately 0.7% of all new cancer cases and 0.7% of all cancer deaths each year, with a 67.2% 5-year relative survival rate overall. However, these statistics represent all women affected by cervical cancer and may underestimate the significant disparities that exist within different subpopulations of this group. Disparities in abnormal pap smears, HPV infection status, increased time to follow up from abnormal screening, HPV vaccination rate in addition to rates of cervical cancer diagnoses, advanced disease and mortality all have intersections across racial/ethnic, geographic, socioeconomic groups. The social determinants of health (SDH) are non-medical risk factors that can influence the health of populations. They include a variety of social, economic, political, and environmental factors that can affect health outcomes. The area of deprivation index (ADI) is a tool that utilizes data from the American Community Survey (ACS) on 17 measures to give a composite measure of neighborhood socioeconomic disadvantage. It is a publicly available tool, accessible online that is highly validated and can be used to approximate some of these health outcomes. However, cervical cancer as well as health disparities in general are multifactorial and more research is needed to look into the complex interplay of biologic and socioeconomic risk factors. The goal of this study is to further investigate the disparities that exist in a population of patients with abnormal pap smears utilizing ADI as a marker of socioeconomic disadvantage. The primary aim is to investigate the relationship between ADI and colposcopy completion in patients with abnormal pap smear. The secondary aims are to evaluate the time from initial abnormal pap smear to colposcopy completion date in patients in relationship to ADI, in a survival analysis setting, to determine the correlation between ADI and HPV vaccination status in patients with abnormal pap/HPV, and lastly, to report on the age, BMI, race and ethnicity in a large population of patients with abnormal pap smears in relation to ADI status. **Design:** Subjects aged 18 or older will be taken from an active 12 month rolling Epic clinical database containing approximately 13,000 patients who have had an abnormal pap smear and/or HPV result in the previous 12 months. Abnormal pap smear results which do not require a colposcopy (i.e. ASCUS, HPV negative) will be excluded from the study population. Data will be collected regarding patients' HPV vaccination status, pap smear date, colposcopy completion status, colposcopy date, number of days from abnormal pap smear to colposcopy as well as if they were contacted by coordinator to assist with scheduling their colposcopy. The patient's ADI score will be pulled directly from Epic utilizing the embedded Neighborhood Index tool which assigns patients a national score percentile from 1-100, with 1 being the least disadvantaged and 100 being

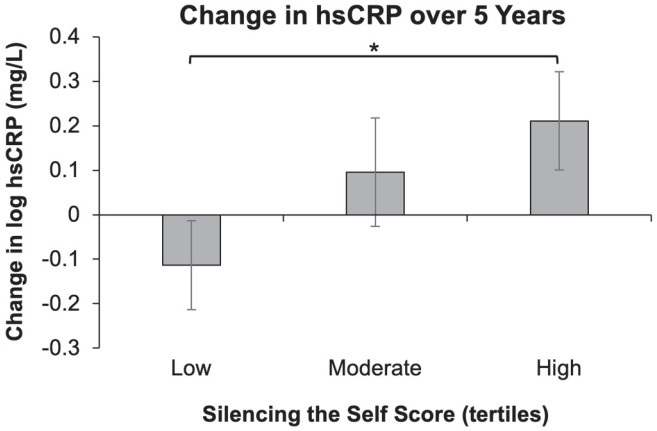
the most disadvantaged. Approximately normally-distributed continuous measures will be summarized using means and standard deviations and will be compared between the groups using ANOVA. Continuous measures that show departure from normality and ordinal measures will be summarized using medians and quartiles and will be compared using Kruskal-Wallis tests. Categorical factors will be summarized using frequencies and percentages and will be compared using Pearson's chi-square tests or Fisher's Exact tests. Time from initial abnormal pap smear to colposcopy completion date will be calculated in a survival analysis setting, and censored at 12 months since it is the upper limit the database holding the patients' information. Month will be defined as 30 days. Log-rank tests, Cox proportional hazards regression right-censored univariate models, and Cox univariate Wald tests will be performed **Results:** Data collection and analysis for this project is pending at this time. **Conclusion:** Final conclusions and discussion pending data collection and analysis.
Sources of Funding: None

P-23.

Associations Between Self-Silencing and Inflammation in Midlife Women

Alicia M. Cole, B.S.[1], Karen Jakubowski[1], Mary Y. Carson, M.S.[1], Pauline Maki, PhD[2], Rebecca Thurston[1]. [1]University of Pittsburgh, Pittsburgh, PA; [2]University of Illinois at Chicago, Chicago, IL

Objective: Evidence suggests that interpersonal stressors may relate to inflammation. Some individuals adopt behaviors to maintain relationships that may adversely affect their health, such as self-silencing. Self-silencing can include: (1) viewing oneself through external standards, (2) employing self-sacrifice to demonstrate care to others, (3) inhibiting self-expression to avoid relationship conflict, and (4) presenting an outwards "divided self" that conforms to societal expectations. Self-silencing has been linked to adverse physical health outcomes (e.g., fibromyalgia, inflammatory bowel syndrome), but its connection to inflammation remains unclear. We aimed to study whether midlife women who reported greater self-silencing in their current/most recent intimate relationship showed increased interleukin-6 (IL-6) and high-sensitivity C-reactive Protein (hsCRP) over five years. **Design:** A group of 297 non-smoking women (40-60y; 27.2% racial/ethnic minorities) participated in a study on cardiovascular health. Five years later, 167 returned for follow-up. At baseline, women self-reported self-silencing (modified Silencing the Self Scale [STSS]; total and subscale scores), demographics, and depression) and provided medical history, body mass index (BMI), and a blood draw (IL-6, hsCRP). At follow-up, women repeated all measures except STSS. Women with autoimmune disorder(s) (N=13) or taking immunosuppressants (N=2), or, for hsCRP analyses, had values of hsCRP>10 mg/L (suggestive of acute infection; N=26) were excluded. Linear regression models examined relationships between STSS total/subscales and inflammation at baseline (IL-6: n=289, hsCRP: n=272), follow-up (IL-6: n=151, hsCRP: n=132), and change in IL-6 and hsCRP (difference between baseline and follow-up log values), adjusted for age, race, education, BMI, depression, and anti-inflammatory medications. **Results:** Greater overall self-silencing was associated with increased hsCRP over five years [B(SE)=.02 (.01), p=.04; Figure]. Considering subdomains, presenting an external "divided self" [B(SE)=.04 (.02), p=.04] and care through self-sacrifice [B(SE)=.07 (.03), p=.04] were related to increased hsCRP over five years. Self-silencing was not associated with IL-6. **Conclusion:** Self-silencing was associated with increased hsCRP over five years, suggesting that emotional suppression in relationships may play a role in chronic inflammation. Future research should consider whether targeting self-silencing behaviors via psychosocial intervention to enhance relationship assertiveness skills can help reduce inflammation in women.
Sources of Funding: NIH grants (RF1AG053504 and R01AG053504 to RCT & PMM), NHLBI (K24HL123565 and R01HL105647 to RCT).



Note. Larger values indicate greater increase in hsCRP over five years. Self-silencing displayed as tertiles for illustrative purposes. *p<.05.

P-24.

"It's kind of isolating because you're on your own private journey": a qualitative exploration into the experience of menopause in a US workplace

Sharon Mallen, MD[1], Jennifer Coppola, PhD[1], Mary Jane Minkin, MD[2], Alexis Ward, MSc Psychology[3], Penny Clark, PhD[3]. [1]Pfizer Inc., New York, NY; [2]School of Medicine, Yale University, New Haven, CT; [3]Studio Health, London, United Kingdom

Objective: This research set out to uncover the experiences of menopause in the workplace, to challenge misconceptions and stigma about this life stage, and to enhance workplace strategies to better support midlife women. **Design:** Semi-structured interviews were conducted as part of a larger mixed-methods study to explore women's experiences and perceptions of menopause in the workplace. Eligible participants were women aged 40-65 years who self-identified as having personal experience of the menopause transition, selected by purposive sampling from respondents to an online survey circulated to all US-based employees of US-headquartered pharmaceutical company Pfizer Inc. In-depth interviews explored: attitudes of women experiencing menopause, experiences of symptoms and changes, perceptions of support available in the workplace, coping strategies, and challenges associated with menopause in the workplace. Inductive thematic analysis was conducted to identify themes and patterns in the data. **Results:** Eighteen women took part in in-depth interviews, of whom 61% identified as non-white. Inductive thematic analysis uncovered 5 themes: **(1) menopause as a uniquely personal experience** highlighting that experiences of menopause were widely varied in the participants' impact of symptoms, the context of their working environment, and desires for support; **(2) identity reframed by menopause** where menopause impacted how women thought about themselves, particularly around their identities as women and associations with growing older, although some felt empowered with the confidence and wisdom that midlife has offered them; **(3) the impact on professional standing** incorporating how women viewed their professional capabilities and their perceptions of how they were viewed by colleagues and management, which were related to lowered confidence and feelings of anxiety; **(4) the burden of managing menopause** accounting for the efforts undertaken by women to manage and mask menopause symptoms, with many sharing experiences of uncertainty and lack of control related to unpredictable symptoms; and **(5) feeling safe enough to share** which encompassed participants' experiences of navigating what was appropriate to disclose with their colleagues or managers and expressing desires for more awareness and understanding of menopause and opportunities to connect with others experiencing it. In response to these results, Pfizer disseminated resources to help educate and support colleagues, which included an internal workplace edition of the menopause: unmuted podcast series. The internal podcast accrued more than 1,000 listens within the first week of being released. **Conclusion:** Women's experiences of the menopause transition in a work context are highly personal and "one size does not fit all." As well as making accommodations for the physical symptoms of menopause, employers should consider the emotional burden and impact of menopause on self-confidence in the workplace and provide resources that help educate employees and support those navigating this transition into midlife. This research highlights the need for workplaces to be safe and supportive environments in which women feel empowered to share – rather than mask – their experiences in this phase of life. Among other activities, Pfizer developed an internal podcast series to help educate and support colleagues on navigating menopause in the workplace.
Sources of Funding: Pfizer Inc. provided funding and contributed to the study design, but not data collection or analysis.

P-25.

Menopause in a US Workplace: a window into midlife women's experiences of the menopausal transition at work – results of a company-wide workplace survey

Sharon Mallen, MD[1], Jennifer Coppola, PhD[1], Nicole Shaffer, DNP[1], Candida Halton, MSc, MSc[2], Penny Clark, PhD[2]. [1]Pfizer Inc., New York, NY; [2]Studio Health, London, United Kingdom

Objective: Despite the important role women play as contributors to the US economy, there is insufficient literature on the impact of menopause symptoms on the workplace experience. This research aimed to better understand the prevalence and impact of menopausal symptoms for midlife women in a US workplace, with the ambition of enhancing workplace educational strategies to challenge misconceptions and stigma about this life stage. **Design:** An online survey was developed and disseminated to all US-based employees of US-headquartered pharmaceutical company Pfizer Inc. Eligible respondents were aged 40-65 years and self-identified as having personal experience of the menopause transition. Survey questions were developed using health literacy best practices to discuss menopause and symptom impact. The survey (which took 10-15 minutes to complete on Microsoft Forms) covered participant demographics, stage of menopause, experiences and impact of menopause symptoms on daily life, experiences and impact of menopause symptoms at work, and perceptions and experiences of support at work. The survey was reviewed and approved by relevant company stakeholders to ensure ethically appropriate and aligned with appropriate privacy and data protection standards. Descriptive statistics were generated. Quantitative data presented here forms part of the wider mixed-methods study. **Results:** A total of 1,778 people completed the survey and 1,642 were eligible for inclusion in the analysis. Among respondents, 19% identified as non-white and 57% were between 46 and 55 years of age; 97% of respondents reported being in good health. Colleagues at all levels of the organization took part in the survey, including administrative (7%), operational (27%), managerial (26%), directorial (37%), and Vice President level and above (3%). Respondents self-reported where they were in their menopause journey with the majority (70%) currently experiencing menopause symptoms. An additional 18% reported being asymptomatic

pre-menopausal and 13% asymptomatic post-menopausal. The symptoms most commonly impacting workplace performance included changes to normal sleep patterns (28%), changes to memory (20%), hot flashes (14%), and anxiety (10%). Women experiencing symptoms reported being less able to concentrate (39%), more stressed (34%), less confident (22%), less patient (20%), and 6% took time off work due to symptoms. Overall, 75% of survey respondent reported having their work negatively impacted by menopausal symptoms. Although 50% of women disclosed that they felt, or would feel, extremely or somewhat comfortable discussing menopause with colleagues, 92% of women shared feeling a lack of support with their menopause symptoms at work. The survey also revealed a need for further education around menopause – only 25% of respondents felt very or extremely knowledgeable about this topic, despite their own lived experience. In response to these results, Pfizer developed a series of educational materials for their US colleagues, including a dedicated menopause internal website with practical resources. **Conclusion:** In this survey of midlife women in a US workplace, changes in sleep and memory were the most common symptoms of menopause which impacted women's perceptions of their own performance at work. This research also reveals a substantial gap in knowledge about menopause and highlights the need for further education and support in the workplace for women in this phase of life. Pfizer therefore created an internal website dedicated to providing menopause resources, among other activities to support and educate their colleagues.

Sources of Funding: Pfizer Inc. provided funding and contributed to the study design, but not data collection or analysis.

P-26.

Feasibility and Acceptability of a Multi-Component Intervention to Reduce Cardiovascular Disease Risk in Latinas During the Menopause Transition

Yamnia I. Cortes, PhD, MPH, MSN, FAHA, FAAN[1], Valentina Marginean, BSN, RN[1], Andrea Cazales, BSN, RN[3], Latesha K. Harris, BSN, RN[3], Christian A. Long, BS, MLS[3], Cheryl Woods Giscombe, PhD, PMHNP, FAAN[3], Krista Perreira, PhD[2]. [1]College of Nursing, University of Iowa, Iowa City, IA; [2]Social Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC; [3]School of Nursing, University of North Carolina at Chapel Hill, Chapel Hill, NY

Objective: Cardiovascular disease (CVD) risk increases substantially during the menopause transition. Latinas have a significantly worse CVD risk factor profile than non-Latina White women, potentially due to multiple sociocultural, environmental, and behavioral factors. Yet, Latinas remain underrepresented in research. The purpose of this study was to evaluate the feasibility and acceptability of a multi-component intervention to reduce CVD risk in Latinas during the menopause transition. **Design:** This is a randomized two-group, repeated measures experimental study. Forty-nine Latinas (age 40-60 years) in the menopause transition were randomized to a culturally-tailored multi-component intervention (n=26) or wait-list control (n=23). The intervention consisted of 12-weekly sessions with 60 minutes of education (diet, stress management, coping skills training) and 60 minutes of physical activity (stretching, walking, resistance bands, Zumba), followed by 3 months of continued support, and 6 months of skill maintenance on their own. We collected the following data at three timepoints (baseline, 6 months, 12 months): sociodemographics, anthropometric measures (body mass index, waist circumference, blood pressure), and health behaviors (nutrition, physical activity, sleep). We assessed carotid-femoral pulse wave velocity, fasting lipids, and blood glucose at baseline and 12 months. Both groups received a personalized health report with their CVD risk factor data at the end of each study visit. Feasibility and acceptability measures included enrollment and retention rates, intervention fidelity, and participant satisfaction. Descriptive statistics were conducted using SAS version 9.4. **Results:** At baseline, the total sample (n=49) had a mean age of 47.8 ± 4.4 years, 97% were born outside of the United States, 51% reported it was somewhat/very difficult to pay for basics, and 64% were uninsured. Eighty-eight percent (22 intervention, 21 control) of participants completed 6-month follow-up, and 84% (21 intervention and 20 control) completed 12-month data collection. On average, women in the intervention group attended eight (53.3%) sessions. In the intervention group, we found a mean decline in perceived stress (-1.71 ± 2.49; 95% CI: -2.79, -0.61) from baseline to 6 months. We found a mean decrease in sleep disturbances in the intervention (-2.3 ± 4.76; 95% CI: -4.46, -0.18) and control group (-1.65 ± 3.46; 95% CI: -3.30, -0.01) from baseline to 12-months. No other significant changes were noted. At 12 months, 94.6% of participants reported they would recommend the study to a family member or friend. **Conclusion:** This pilot study found that a culturally tailored multi-component intervention consisting of nutrition education, physical activity, and stress management is feasible in Latinas during the menopause transition. However, 15 intervention sessions may have been burdensome, as evidenced by the average attendance rate. We noted decreased perceived stress and sleep disturbances in the intervention group. Based on our feasibility data, a larger study is planned with a modified intervention.

Sources of Funding: This study was funded by the National Institutes of Health and the National Institute of Minority Health and Health Disparities (K23MD014767, PI: Cortés), and the University of North Carolina Provost's Office Junior Faculty Development Award. Additional support was provided by the NC TraCS Inclusive Science Program (ISP) UL1TR002489 (Perreira).

P-27.

Male Sexual Function of the Climateric Women's Partners: A Study with Partners

LUCIA COSTA- PAIVA, MD, PhD, Ana Lucia R. Valadares, MD, PhD, Adriana O. Pedro. OBSTETRICS AND GYNECOL, State University of Campinas, Campinas, Brazil

Objective: Menopause and aging can have a negative impact and deterioration on physical and mental health and female sexual function. It is known that the symptoms of menopause may affect the sexual function of climacteric women. Although female sexual dysfunction is complex and multifactorial, little is known about how the male sexual function of partners of climacteric women is like and what form can also impact a couple's sexual function. To evaluate the sexual function of middle-aged men, partners of climacteric women and the relationship with couple sexual satisfaction. **Design:** A cross-sectional study was carried out with 266 couples (a total of 532 individuals) between 50 and 70 years. The sample size was calculated based on the estimated prevalence of sexual dysfunction in women at 35% and in men at 28% and an estimation precision with a difference between the proportion of the population and with a significance level of 5%, the number of calculated women was 256 women and 225 men. The women and their partners were selected using the "snowball" technique, formed from the "ego" couples who answered the interview on sociodemographic, general health, and sexual function questions. They were carried out via internet telephony by interviewers trained for the project. Interviews were conducted separately with the woman and her sexual partner. Female sexual function was evaluated using the Short Personal Experiences Questionnaire (SPEQ), male sexual function Sex Quotient - Male Version (QS-M). This study was approved by the Research Ethics Committee of the State University of Campinas (number CAAE:07641019.3.0000.5404). The TCLE, which gave their consent and was recorded before the interviews, clarified all interviews. **Results:** A total of 266 couples (532 individuals) were interviewed. The average age of women was 57.45 (5.08) years and men were 59.97 (6.28) and 92.86% of women were in menopause. Male interviewees were married to or cohabiting with their coupled female interviewee. The main sociodemographic characteristics of the men showed that 60.15 % were white, 58 % had nine or less years of formal education, the mean BMI was 27.7 Kg/m2, and almost 50% were sedentary and had high blood pressure. The mean score of QS-M sexual function was 75.5 (10.11). The prevalence of male sexual dysfunction was 16.41%, while in women, it was 46% which statistically significant differences ($P < .001$). The most compromised domains in male sexual function were erection disorders in 22% of men, 27.7% reported poor seduction capacity, 37% had difficulty controlling ejaculation and only 12% thought that foreplay was not very pleasurable or satisfactory for them and their partners. **Conclusion:** In middle-aged couples, the partner's sexual dysfunction may be present and needs to be adequately assessed to improve the couple's sexual satisfaction at this stage of life.

Sources of Funding: This research received financial support from the **The São Paulo Research Foundation** - FAPESP

P-28.

Menopausal Awareness: Use of a Menopausal Questionnaire to Assess Symptomology in Menopausal Transition and Postmenopausal Women

Lori Dalcour, DNP[1], Deborah MacMillan, Post Doctoral Degree[1], Sallie Coke, PhD[1], Jessica Marcus, DNP[2]. [1]Nursing, Georgia College and State University, Snellville, GA; [2]Nursing, Georgia State University, Atlanta, GA

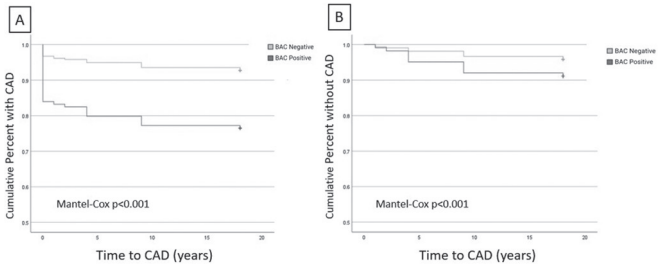
Objective: Women can experience debilitating symptoms of hot flashes, night sweats, memory loss and vaginal dryness during the menopausal transition and postmenopausal period. Limited knowledge and awareness about the menopausal experience by patients and clinicians has been correlated to delays in recognizing and managing symptoms. Relying on provider elicited review of system (ROS) questions versus patient reported questionnaires for screening of symptoms and patient's awareness of problems has been shown to limit the completeness of information in the electronic health record (EHR) and effectiveness of communication between provider and patient. The practice site for this quality improvement project lacked a formal process for screening, evaluating and educating patient's menopausal awareness and goals for quality of life. The Ferlie and Shortell: Framework for Change was identified to facilitate change and increase communication between patients, providers and staff. The purpose of this project was to implement and evaluate a process for routinely screening and educating all patients between 40 and 65 years seen in the practice for well woman or annual exams. The Menopause-Specific Quality of Life Intervention Questionnaire (MENQOL-I) instrument measured the patient's perception of symptomology as experienced during last month. Information provided by the patient was used by providers to evaluate patient awareness about the menopausal experience and improving the quality of life. Education and treatment options that were individually based was the goal. Publications developed by The North American Menopause Society were used to facilitate the providers' ability to provide quality education during the patient visit. **Design:** In premenopausal, menopausal, and postmenopausal women with symptomology, how effective is the use of a menopause questionnaire in assessing menopausal awareness compared to current practice? This quality improvement project used pre- and post-chart audits to evaluate the effectiveness of a practice change that used an evidenced-based screening questionnaire for patients. **Results:** Of the 91 pre-MENQOL-I audits, 50 post-MENQOL-I audits and questionnaires, the following was collected and analyzed: age, menopausal status, history of surgical or medical induced menopause, documentation of menopausal symptoms in History of Present Illness (HPI), history of hormone replacement therapy (HRT) and eligibility for HRT, documentation of menopausal symptoms in the Review of Systems (ROS), and 29 items assessing menopausal symptoms, and 3 items assessing menopausal symptoms with HRT. For every symptom, the MENQOL-I identified higher rates of

menopausal symptoms than use of the provider elicited ROS questions. The use of the EHR template often autopopulated patients as having "no menopausal symptoms", but the MENQOL-I indicated there were. The providers rated the MENQOL-I as being "very helpful" (86%) or as being "somewhat helpful" (14%) in identifying the patient's perception of how bothersome the symptoms. When surveyed, 71% of providers stated "yes" to the use of the MenoNotes in patient education and 29% stated "no". When providers were asked for suggestions related to the QI project process, the continued barriers to be addressed were related to incorporating the MENQOL-I into the EHR ROS and consideration of having the patient complete prior to the office visit and be uploaded to the patient portal. **Conclusion:** The pre- and post- chart audits revealed that the use of a menopausal questionnaire helped in assessing symptoms for the menopausal transition and postmenopausal patients. Patients were able to share their experience and severity of symptoms that are often missed with the ROS during the annual visit. Research must continue to create systems that focus on minimizing the gap and educating women about the menopausal period and what to expect. The framework assisted the practice in identifying current practices that hinder the quality of patient care and used a multilevel approach to implement a formal process to optimize system resources and patient outcomes. During data collection, documentation errors were found related to the use of the EHR templates and patient responses on the questionnaire.
Sources of Funding: None

P-29.

The association between breast arterial calcifications observed on mammography and cardiovascular disease: preliminary results from an 18-year prospective study

Schyler Said[1], Maggie Feng[1], Hannah Daley[1], Marie Tan[1], Jenna Ehlert[1], Erica Crawford[1], Emma J. Christensen[2], Matthew Nudy, MD[2], Xuezhi Jiang, MD, PhD[3], Peter Schnatz[3]. [1]Drexel University College of Medicine, Philadelphia, PA; [2]Penn State College of Medicine, Hershey, PA; [3]OB/GYN, Reading Hospital Tower Health, West Reading, PA
Objective: Cardiovascular disease (CVD) is the leading cause of mortality in women and is responsible for 1 in every 3 deaths each year in the United States. Despite this, existing cardiac risk assessment tools specific to women are lacking. Prior research has shown an association between the presence of breast arterial calcifications (BAC), which can be visualized on routine mammography and CVD. Therefore, this study aims to assess the longitudinal association between BAC and atherosclerotic CVD (ASCVD). **Design:** Women were recruited at mammography centers in Connecticut. Data was collected on baseline demographics, race/ethnicity, menopause status, CVD risk factors (i.e. hypertension, diabetes, smoking), and family history of CVD. A follow-up survey at year 1, 2, 4, 5, 10 and 18- years was distributed to assess for the development of ASCVD risk factors and events. A Mantel-Cox test was performed to assess time to an ASCVD risk factor and event stratified by BAC status over all follow-up years. A Chi-square test was conducted to analyze the association between BAC and cumulative ASCVD events. **Results:** At baseline 1,995 women completed the survey. The mean (±standard deviation) age was 56.3 (±12.1) years and 60.9% of women were menopausal. BAC was present on 14% of mammograms and 4.9% of women had known ASCVD at baseline. After 18 years of follow-up, 383 (19.2%) women completed the survey. Mantel-Cox analysis shows a significant association between BAC and freedom of an ASCVD event for participants with and without known ASCVD at baseline ($p<0.001$ and $p<0.001$, respectively). Mantel-Cox analysis revealed a significant association between BAC and freedom of an ASCVD risk factor in those with an ASCVD risk factor at baseline, and a non-significant association in those without an ASCVD risk factor at baseline (N [with BAC] = 268, N [without BAC] = 1651, $p<0.001$, $p=0.149$, respectfully). Cumulatively, women with BAC were more likely to experience ASCVD events over 18 years of follow-up (23% in those with BAC compared to 13.9% in those without, $p<0.001$). Figure 1. A and B show Kaplan-Meier curves depicting Mantel-Cox analysis of time to development of CVD event stratified by BAC status including and excluding those with CVD at baseline, respectively (N [with BAC] = 268, N [without BAC] = 1651, $p<0.001$, $p<0.001$). **Conclusion:** This study shows an association with BAC found on mammography and the development of both ASCVD events and risk factors over 18 years of prospective follow-up. These results suggest that the identification of BAC on routine mammography may serve as a marker for increased ASCVD risk in women over time. The presence of BAC on a mammogram should be routinely reported.
Sources of Funding: None



P-30.

Complementary and Alternative Therapies for Genitourinary Syndrome of Menopause: An Evidence Map

Kristen Ullman, MPH[1], Susan Diem, MD, MPH[1,2], Mary Forte[3], Kristine Ensrud[1,4], Catherine Sowerby[1], Nicholas Zerzan[1], Maylen Anthony[1], Adrienne Landsteiner[1], Nancy Greer[1], Mary Butler[3], Timothy Wilt[1,2], Elisheva Danan, MD, MPH[1,2]. [1]Center for Care Delivery and Outcomes Research, Veterans Health Administration, Newport, MN; [2]Department of Medicine, University of Minnesota, Minneapolis, MN; [3]Division of Health Policy & Management, University of Minnesota, Minneapolis, MN; [4]Division of Epidemiology & Community Health, University of Minnesota, Minneapolis, MN
Objective: Postmenopausal vulvovaginal, urinary, and sexual symptoms (often termed genitourinary syndrome of menopause or GSM) affect approximately 50-70% of postmenopausal women. Women seeking non-hormonal interventions for these symptoms may choose complementary and alternative therapies. The Agency for Healthcare Research and Quality (AHRQ) collaborated with the Patient-Centered Outcomes Research Institute (PCORI) to fund a systematic evidence review on interventions for GSM symptoms. Here, we describe a portion of this systematic review focused on RCTs of complementary and alternative therapies to treat GSM symptoms. **Design:** A systematic review was conducted on screening for and treatment of GSM with the protocol registered in PROSPERO (CRD42023400684). We searched Ovid/Medline®, Embase®, and CINAHL® from inception through December 11, 2023. Data were abstracted by 1 reviewer and verified by a second. We included randomized controlled trials (RCTs) ≥8 weeks duration that evaluated the effectiveness or harms of complementary and alternative therapies for postmenopausal women with GSM and reported ≥1 outcome of interest, with sample size ≥20 participants randomized per arm. Outcomes of interest included urinary (dysuria, frequency, urgency, nocturia, urge incontinence, recurrent urinary tract infections, overactive bladder), sexual (dyspareunia, orgasmic dysfunction, low libido, decreased arousal, desire, function, bleeding associated with sexual activity), vulvovaginal symptoms (vaginal/vulvar irritation, soreness, pain, vulvovaginal dryness/lubrication), quality of life, depression, and anxiety. **Results:** We used an evidence map approach to organize and describe trials by type of intervention, according to the National Center for Complementary and Integrative Health (NCCIH) framework. We narratively summarized populations, study characteristics, intervention(s), and outcomes. We identified 57 RCTs that investigated 39 unique interventions. Studies were typically small (n<200), and most were conducted in Iran (k=24) or other parts of Asia (k=9). Nine studies enrolled women with a history of breast or gynecological cancers. Few RCTs evaluated similar combinations of populations, interventions, comparators, or outcomes. Most studies (k=44) examined natural products (i.e., herbal or botanical supplements, vitamins), while fewer reported on mind and body practices (k=6) or educational programs (k=7). Most studies reported one or two GSM symptoms, mainly sexual (k=44) or vulvovaginal (k=30). Tools used to measure outcomes varied widely. Most trials reported on adverse events (k=33). Of the 44 RCTs of natural products, the majority investigated phytoestrogen supplements (k=31). Most phytoestrogen supplements were investigated in only one trial, though there were multiple RCTs of soy (k=5), Pueraria mirifica (k=4), and fenugreek, licorice, red clover and Tribulus terrestris (k=2 each). **Conclusion:** We identified a large number of RCTs testing a broad range of interventions. Most studies were small, short-term, conducted outside the US, and too heterogeneous to allow for evidence synthesis. Inconsistency in product formulation, dosing, route, and administration is a perennial challenge for evaluating natural products. Across 57 RCTs, we found few studies testing identical products. For example, though we identified 31 trials testing 20 different phytoestrogens for GSM symptoms, all used different compounds or doses and reported different symptom outcomes, making synthesis impossible and effectiveness estimates challenging. Detailed assessment of study outcomes and use of standardized population, intervention, comparator, and outcomes reporting in future RCTs are needed.
Sources of Funding: Agency for Healthcare Quality and Research and Patient-Centered Outcomes Research Institute.

P-31.

Energy-Based Interventions for Genitourinary Syndrome of Menopause (GSM): A Systematic Review

Nicholas Zerzan, MPH[1], Nancy Greer, PhD[1], Kristen Ullman, MPH[1], Katie Sowerby, BA[1], Susan Diem, MD, MPH[1,2], Kristine Ensrud, MD[1,2], Mary Forte, PhD, DC[2], Maylen Anthony, MPH[1], Adrienne Landsteiner, PhD, MPH[1], Mary Butler, PhD[2], Timothy Wilt, MD, MPH[1,2], Elisheva Danan, MD, MPH[1,2]. [1]VA Health Care System, Minneapolis, MN; [2]University of Minnesota, Minneapolis, MN
Objective: Energy-based interventions for genitourinary syndrome of menopause (GSM), such as laser and radiofrequency (RF) treatments, are gaining popularity, fueled by perceived limitations and fears related to vaginal estrogens and other hormonal therapies. Energy-based treatments heat tissue to cause a denaturation of collagen fibers and induce a wound-healing response. These effects may result in enhancement of vaginal elasticity, restoration of premenopausal epithelial function, and symptom improvement. However, the US Food and Drug Administration (FDA) has not evaluated the safety and effectiveness of energy-based treatments for menopausal symptoms and issued a warning in 2018 regarding energy-based devices for 'vaginal rejuvenation.' We conducted a systematic review to assess the benefits and harms of energy-based interventions for GSM symptoms to inform clinical decision making for clinicians and patients. **Design:** We searched MEDLINE®, Embase®, and CINAHL® from database inception through December 11, 2023, supplementing the search with citation searches of relevant systematic reviews and original research. Our protocol was registered in PROSPERO (CRD42023400684). Randomized controlled trials (RCTs) and prospective observational studies with a concurrent control group were eligible if they enrolled postmenopausal

women with at least one symptom of GSM, evaluated energy-based treatments, were ≥8 weeks in duration, enrolled ≥20 per arm, and reported ≥1 prespecified outcome of interest. Non-randomized and uncontrolled studies of energy-based treatments were eligible for long-term adverse event (AE) analysis if they reported follow-up of ≥12 months. We evaluated risk of bias (RoB) using the Cochrane Risk of Bias Tool 2.0 (RoB-2) for RCTs and the Risk of Bias in non-Randomized Studies - of Interventions (ROBINS-I) for non-randomized studies. Data were abstracted by one reviewer and verified by a second. Outcomes of interest included eight previously identified GSM "Core Outcomes in Menopause:" dyspareunia; vulvovaginal dryness; vulvovaginal discomfort/irritation; dysuria; change in most bothersome symptom; distress, bother, or interference associated with genitourinary symptoms; treatment satisfaction; and AEs. For longer-term AE data, we narratively summarized observational studies with ≥12 months follow-up. We extracted results comparing change from baseline to follow-up between groups. We reported within-group outcome change scores when between-group comparisons were absent. Certainty of evidence (COE) for outcomes was determined using the GRADE approach based on statistical significance. **Results:** We identified 32 unique studies (16 RCTs; 1 quasi-RCT; 15 non-randomized). Ten RCTs and the quasi-RCT were rated low to moderate RoB and underwent further data extraction. Included studies evaluated carbon dioxide (CO_2) laser (7), erbium-doped yttrium aluminum garnet (Er:YAG) laser (3), or CO_2 laser and radiofrequency (1). Studies were small, short in duration, and predominantly conducted outside the United States. Mean age ranged from 56-64 years; race was rarely reported. Compared with sham laser, CO_2 laser may result in little to no difference in dysuria, dyspareunia, or quality of life (low COE). Compared with vaginal conjugated estrogens cream (CEC), CO_2 laser may result in little to no difference in dyspareunia, dryness, discomfort/irritation, dysuria, or quality of life (low COE). Treatment effects on other outcomes, and effects of Er:YAG laser or radiofrequency on any outcomes are very uncertain (very low COE). Studies noted few AEs and no serious AEs. **Conclusion:** We found that CO_2 laser, Er:YAG laser, and radiofrequency energy-based therapies may offer no benefit, or have insufficient evidence, relative to any comparator for any GSM symptom. Future studies should investigate other energy-based treatments, differing protocols, and longer follow-up.
Sources of Funding: Agency for Healthcare Quality and Research and Patient-Centered Outcomes Research Institute.

P-32.
Treatments for genitourinary syndrome of menopause: a systematic review of hormonal interventions and vaginal moisturizers

Elisheva Danan, MD, MPH[1,2], Catherine Sowerby[1], Kristen Ullman, MPH[1], Mary Forte[2], Nicholas Zerzan, MPH[1], Maylen Anthony[1], Adrienne Landsteiner[1], Nancy Greer[2], Rahel Nardos[2], Mary Butler[2], Timothy Wilt[1,2], Kristine Ensrud[2], Susan Diem, MD, MPH[1,2]. [1]Minneapolis VA Health Care System, Minneapolis, MN; [2]University of Minnesota, Minneapolis, MN

Objective: Postmenopausal women commonly experience vulvovaginal, urinary, and sexual symptoms associated with genitourinary syndrome of menopause (GSM). We conducted a systematic review to evaluate the effectiveness, comparative effectiveness, and harms of vaginal estrogen, non-estrogen hormonal therapies, and vaginal moisturizers for treating GSM symptoms. **Design:** We searched MEDLINE®, Embase®, and CINAHL® from database inception through December 11, 2023, supplementing with citation searches of relevant systematic reviews and original research. Our protocol was registered in PROSPERO (CRD42023400684). We searched for randomized controlled trials (RCTs) evaluating effectiveness or harms of hormonal interventions or vaginal moisturizers for GSM in postmenopausal women with ≥1 GSM symptom. We included English-language publications of RCTs (≥8 weeks duration, ≥20 participants per arm) evaluating US-available vaginal estrogen (cream, tablets, inserts, or ring), vaginal or systemic dehydroepiandrosterone (DHEA), oxytocin vaginal gel, oral selective estrogen receptor modulators (SERMs), vaginal testosterone, and vaginal moisturizers. Eligibility criteria were assessed by 2 independent reviewers, reaching consensus for inclusion. Articles that met eligibility criteria were assessed for risk of bias (RoB) using Cochrane Risk of Bias Tool 2.0 (RoB-2). RoB and data extraction were performed by 1 reviewer and verified by a 2nd. Certainty of evidence (COE) for outcomes was determined using the GRADE approach based on statistical significance. COE was assessed by 1 reviewer and verified by team consensus. **Results:** From 11,933 citations, we identified 49 RCTs evaluating vaginal estrogen (24), non-estrogen hormones (17), and vaginal moisturizers (4), or multiple interventions (4). Populations, interventions, comparators, and outcomes varied widely and precluded meta-analyses. Most studies were ≤12 weeks in duration. Compared with placebo or no treatment, vaginal estrogen may improve vulvovaginal dryness, dyspareunia, "most bothersome symptom," and treatment satisfaction (low COE). Compared with placebo, vaginal DHEA may improve dryness, dyspareunia, and distress, bother, or interference of genitourinary symptoms; oral ospemifene may improve dryness, dyspareunia, and treatment satisfaction; vaginal moisturizers may improve dryness (all low COE). Vulvovaginal discomfort/irritation or dysuria outcomes were evaluated in few studies and no treatments demonstrated efficacy for these outcomes. Vaginal testosterone, systemic DHEA, vaginal oxytocin, and oral raloxifene or bazedoxifene showed no benefit (low to moderate COE) or had uncertain effects (very low COE). Harms reporting was limited; studies were underpowered to evaluate infrequent but serious harms and were of short duration, limiting conclusions about risk of long-term harms. **Conclusion:** Vaginal estrogen, vaginal DHEA, oral ospemifene, and vaginal moisturizers may improve some GSM symptoms. Little long-term data exists on efficacy, comparative effectiveness, tolerability, and safety of GSM treatments. Future research would be strengthened by standard definitions of symptoms and uniform diagnostic criteria for GSM, a common set of validated outcome measures and reporting standards, comparative effectiveness trials, and long-term follow-up for efficacy, tolerability, and safety.
Sources of Funding: Agency for Healthcare Research and Quality (AHRQ) and the Patient-Centered Outcome Research Institute (PCORI)

P-33.
Ob/Gyn Resident Attitudes and Perspectives on Artificial Intelligence in Medical Education

Katia DaSilva, MD/MA[1], Nihar Ganju, MD, FACOG[2]. [1]Ob/Gyn, George Washington, Washington, DC; [2]RealDocAI, Inc, Miami, FL

Objective: Generative Artificial Intelligence (GenAI) has recently seen rapid exploration and adoption in healthcare, yet its application in Ob/Gyn medical education has not been thoroughly investigated. GenAI has the potential to transform the learning process for residents by providing swift access to personalized educational material summaries, thereby offering tailored learning experiences and real-time decision support. This study aims to investigate the perspectives and attitudes of Ob/Gyn residents towards GenAI integration in their training. This study can guide the development and successful implementation of a specialized educational GenAI platform within Ob/Gyn training, potentially enhancing the learning experience. Design: This was a qualitative study and included a structured survey of 13 questions covering residents' experiences, opinions, and expectations of GenAI integration in their training. Results: There were 19 total responses, with most being PGY1s (33.3%), followed by PGY3s (27.8%). Almost all respondents (94.4%) had never used GenAI for medical education, with most feeling "not very confident" about using GenAI for learning (50%). Most had a "positive" attitude (55.6%) toward GenAI, with 88.8% believing it could positively enhance medical education. Residents had concerns about GenAI surrounding critical thinking, accuracy, equity, and patient complexity. They anticipated using GenAI in various residency settings, with the highest interest in consults/triages (88.2%). 77.8% noted that they would use a GenAI platform at least once a week. A GenAI platform was noted to be a potential benefit in diagnosis and treatment recommendations, medical content learning, and personalized study resources. Conclusion: This study reveals that most respondents have not used GenAI and currently lack confidence in it. However, there was a significantly positive attitude towards GenAI use in Ob/Gyn education. Overall, the results suggest a readiness among residents to embrace AI tools in their education, provided that it addresses their concerns.
Sources of Funding: None

P-34.
Development of a ChatGPT-style app for Ob-Gyn resident education

Katia DaSilva, MD/MA[2], Nihar Ganju, MD, FACOG[1]. [1]RealDocAI, Inc., Miami, FL; [2]Ob/Gyn, George Washington University, Washington, DC

Objective: Generative Artificial Intelligence (GenAI) technology is currently under investigation for its applications in healthcare, with limited exploration in the context of medical education, despite its significant potential. Commercial GenAI apps like ChatGPT are limited due to not having been trained on domain-specific medical knowledge, and not tuned for a medical education use case. This study explored emerging machine learning techniques in medical education. We demonstrate the creation of a mobile, chat-based, GenAI application specifically trained on domain-specific content of Obstetrics and Gynecology speciality. Design: We leveraged Retrieval-Augmented Generation (RAG), an innovative technique to extend a foundational large language model (LLM). Data collection process involved gathering high-quality Ob/Gyn literature, including practice bulletins, committee opinions, and topic summaries from resident physicians. Data was chunked and stored in a vector database with an embedding model. A low-code bot building platform facilitated orchestration of data and question/answering, and enabled the deployment of a user-friendly chat interface for testing. We iteratively refined the system prompts and incorporated few-shot examples for prompt optimization. Thirteen Ob/Gyn residents participated in testing and subjective feedback. Results: We successfully developed and deployed a GenAI application aligned to the Ob/Gyn domain. Residents used the app to seek answers from evidence-based literature, finding it convenient on mobile devices. The chat interface was intuitive, while the quality of literature summarization met acceptable standards. Some users expressed a preference for more specific actionable responses, especially in cases related to cervical screening management. Conclusion: Retrieval augmented generation can be an effective method for aligning a foundational LLM model to be domain-specific to the Ob/Gyn specialty. Such a system has the potential to be a valuable tool for assessing the accuracy and safety of GenAI in answering specialty-specific medical questions. The development of domain-specific GenAI applications could significantly enhance medical education and improve the accessibility of relevant medical knowledge.
Sources of Funding: None

P-35.

Satisfaction and Usefulness of Women's Health Telehealth Consults

Paru S. David, MD[1], Nandini Sodhi[2], Claire Yee[3], Jaxon Quillen[3], Talia Sobel[1], Suneela Vegunta[1]. [1]Womens Health Internal Medicine, Mayo Clinic, Scottsdale, AZ; [2]School of Medicine, University of Arizona, Tucson, AZ; [3]Research and Biostatistics, Mayo Clinic, Scottsdale, AZ

Objective: In the post-COVID era, telemedicine has become common practice and is thought to be beneficial for patients and clinicians. In our women's health clinical practice, we hypothesized that women who are younger, employed, and live farther from clinic will be more satisfied with telemedicine. **Design:** After obtaining IRB approval, we offered a voluntary survey to patients from all three Mayo Clinic sites who completed a women's health telemedicine video consultation from June 19, 2023 to May 31, 2024. The invitation to complete a survey was sent to patients via email. Responses were anonymous, and information was sent to a REDCap database. **Results:** Of the 696 surveys sent, there was a 19.5% response rate. We assessed the impact of employment, age, and distance from clinic on four patient satisfaction outcomes: patient perceived usefulness of telehealth, satisfaction with telehealth, trust in their clinician, and technical difficulties with telehealth. In total, 156 patients completed the questionnaire. The average age was 54.3 years (*SD* = 9.8). Participants were primarily Caucasian (77.9%), employed full time (57%), living 50 miles or less than the clinic (54.8%), and in a suburban setting (68.7%). Results showed that overall, participants did not experience significant technical difficulties and there was no difference based on age, employment, or distance from clinic. A majority of participants found telehealth useful and were satisfied with it, without differences based on age, employment, or distance from clinic. While patients as whole reported on average close to the top of the response scale for satisfaction and usefulness (out of 7 points), patients reported near the middle range of the scale for trust. (Table) **Conclusion:** A majority of women found telehealth to be highly satisfying, useful, and had little to no difficulties with technology regardless of age, employment, or distance from clinic. However, regarding trust, on average, patients reported more towards the middle of the scale, suggesting room to build trust on how clinicians communicate regarding how sensitive information is handled. This can be improved with reassurance and patient education regarding information security around telehealth portals.

Sources of Funding: None

Outcomes by Employment Status, Age and Distance

	Employed Full-time Average (sd)	Not Employed Full-time Average (sd)	Δ	95% CI	P
Usefulness	6.4 (0.9)	6.2 (0.9)	-0.2	(-0.5, 0.1)	0.2423
Satisfaction	6.3 (1.1)	6.3 (1)	0.0	(-0.3, 0.4)	0.8833
Trust in provider	4.8 (0.6)	4.7 (0.8)	-0.1	(-0.4, 0.2)	0.5108
Technical difficulties	1.8 (1.6)	1.9 (1.7)	0.1	(-0.5, 0.7)	0.6823
	54 Years of Age or Younger Average (sd)	Older than 54 Years of Age Average (sd)	Δ	95% CI	P
Usefulness	6.5 (0.7)	6.2 (1.1)	-0.3	(-0.5, 0.1)	0.2423
Satisfaction	6.5 (0.8)	6.2 (1.2)	-0.3	(-0.3, 0.4)	0.8833
Trust in provider	4.8 (0.6)	4.7 (0.9)	-0.1	(-0.4, 0.2)	0.5108
Technical difficulties	1.5 (1.4)	1.7 (1.5)	0.2	(-0.4, 0.8)	0.4972
	<51 Miles Away Average (sd)	>50 Miles Away Average (sd)	Δ	95% CI	P
Usefulness	6.3 (1)	6.4 (0.9)	0.1	(-0.2, 0.5)	0.3486
Satisfaction	6.3 (1)	6.3 (1.1)	0.0	(-0.3, 0.4)	0.8984
Trust in provider	4.7 (0.7)	4.8 (0.6)	0.1	(-0.2, 0.3)	0.5209
Technical Difficulties	1.9	1.9 (1.7)	0.0	(-0.5, 0.6)	0.8942

Scale 1 (strongly disagree) to 7 (strongly agree)

P-36.

Using Daily Hormone Tracking to Understand the Impact of Sleep on Perimenopausal Hormone Fluctuations

Aparna Divaraniya, PhD[1], Elinor Hills, Master of Science[1], Alison Anderson[2]. [1]Oova, New York, NY; [2]Ali Anderson Wellness, LLC, Greenwood Village, CO

Objective: This study examines the impact of sleep duration on daily hormonal levels across a broad user base of perimenopausal women. Building on previous findings that link sufficient sleep with improved reproductive health outcomes (1,2), this research looks closer at the relationship between sleep duration and daily hormone changes. 1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6718648/ 2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4377487/ **Design:** 503 individuals who self-identified as perimenopausal were monitored in this study, encompassing a total of 1,369 menstrual cycles. All individuals were users of the Oova platform, which provides quantitative measurements of luteinizing hormone (LH), urinary progesterone (PdG), and urinary estrogen (E3G) through a urine-based lateral flow and multiplexed immunoassay paired with AI-powered image processing technology. Participants self-reported multiple symptoms within the app, enabling side-by-side evaluations of hormonal levels alongside symptom data. Participants recorded their sleep duration from the preceding night, choosing from the following ranges: 0-3 hours, 3-6 hours, 6-9 hours, and over 9 hours. Hormonal levels were captured daily for at least 15 consecutive days to identify trends. Welsh's two-sided t-tests were used for statistical analyses as the sample sizes were different and unpaired. Data were collected from December 17, 2023, to April 3, 2024. Of the participants, 396 perimenopausal patients had scan data, 397 had journal entry data, and 353 had both, establishing a total sample size of 353. **Results:** This study included a user base with a mean age of 44.468 years and an average BMI of 24.886. The majority of participants did not report any reproductive disorders; however, 37.77% reported at least one disorder. Specific conditions reported included hormonal imbalances (12.52%), fibroids (7.55%), polycystic ovary syndrome (PCOS) (4.77%), and endometriosis (4.37%). Analysis of all symptoms self-reported within the app revealed that sleep duration was the most frequently recorded symptom. A total of 896 entries were logged for sleep, with 1.11% entries for 0-3 hours, 28.68% for 3-6 hours, 66.85% for 6-9 hours, and 3.35% for 9+ hours of sleep. The data indicate that sleep durations of 3-6 hours and 6-9 hours were the most commonly reported among participants. Welsh's two-sided t-tests were used to compare hormonal changes to sleep duration. While no significant differences were observed in the levels of LH and PdG across different sleep durations, a noteworthy difference in E3G levels was found. Participants who reported sleeping between 6-9 hours exhibited significantly higher levels of E3G than those who slept for 3-6 hours ($p < 1.8601154 \times 10{-}5$). This finding suggests a correlation between increased sleep duration and higher concentrations of urinary E3G, indicating that longer sleep may enhance estrogen production or stability. **Conclusion:** This study confirms the positive relationship between sleep duration and estrogen levels, highlighting the importance of adequate sleep for hormonal balance. The findings align with existing research that links sufficient sleep with better reproductive health outcomes12. Specifically, an increase in urinary estrogen (E3G) was observed in participants who slept between 6-9 hours, suggesting that longer sleep durations can significantly enhance estrogen production. By highlighting the link between sleep and E3G levels, the study suggests that interventions aimed at improving sleep may serve as an effective strategy for managing and potentially mitigating the impact of perimenopausal hormone changes. This study's initial findings point to the need for further research to understand how sleep affects daily E3G levels across specific reproductive conditions. The current study did not evaluate whether reproductive conditions were a covariate for the results observed but further research is underway. This study tracked urinary metabolites to measure estrogen (E3G) and progesterone (PdG). One potential limitation of the study is that urine levels may reflect a delay compared to blood levels. While monitoring through urine allowed for daily hormone testing, further evaluation can help elucidate a causality relationship between sleep duration and E3G levels.

Sources of Funding: None.

P-37.

The effects of elinzanetant on simulated driving performance in healthy women: a phase I study

Senka Djordjevic, MD[1], Klaus Francke, MD[2], Gary Kay, PhD[3], Stefan Klein, PhD[2], Marcus-Hillert Schultze-Mosgau, PhD[2]. [1]Bayer Consumer Care AG, Basel, Switzerland; [2]Bayer AG, Berlin, Germany; [3]Cognitive Research Corporation, St. Petersburg, FL

Objective: Clinical trials of elinzanetant (EZN), a selective neurokinin (NK)-1 and NK-3 receptor antagonist, for the treatment of vasomotor symptoms (VMS) associated with menopause have demonstrated beneficial effects on VMS, sleep disturbances, and menopause-related quality of life. In a phase 3 trial (OASIS 3), somnolence (5.1% vs. 1.3%) and fatigue (6.7% vs. 2.9%) were more common with EZN treatment than with placebo. Although EZN should be taken at night before bedtime, the possibility of residual central nervous system (CNS) effects the following morning creates a potential safety risk for patients, particularly when driving motor vehicles. This study investigated the effects of EZN on next-day simulated driving performance and cognitive function. **Design:** This randomized, double-blind, placebo- and active-controlled, four-period, crossover, phase I study included 64 healthy females aged 40–65 years, with a body mass index of 18–38 kg/m^2, a regular sleep pattern, and an Epworth Sleepiness Scale score <10. Important exclusion criteria were the history or presence of a clinically significant condition that could impact participant safety, the validity of study results, or the disposition and effects of study treatment. This included psychiatric disorders, conditions that affect sleep, the use of any medication or dietary supplement that may affect CNS function, and a history of alcohol, substance, or drug abuse. After giving informed consent and completing screening, eligible participants were randomly assigned to receive A. EZN 120 mg, B. EZN 240 mg, C. zopiclone (ZOP) 7.5 mg, or D. placebo for 5 days in one of four sequences (A-C-D-B, B-D-C-A, C-B-A-D, or D-A-B-C). All participants, investigators, and study sponsor were blinded to treatment allocation. Treatments were administered daily in the evening at bedtime as EZN 60 mg capsules on Days 1–5, ZOP 7.5 mg tablets on Day 1 and Day 5, and/or the corresponding placebo tablets given in matching single oral doses to achieve the planned treatment. Each treatment period was separated by a ≥14-day wash-out period, and participants underwent a safety follow up 7–21 days after the last dose of treatment. The primary study endpoint was the standard deviation of lateral position (SDLP) measured in the morning at 9 hours postdose during simulated driving in the monotonous Country Vigilance Divided Attention driving scenario on the Cognitive Research Corporation Driving Simulator-MiniSim. SDLP measures the ability to maintain a consistent position within the lane while driving and has a high degree of test-retest reliability. Participants trained during screening and practiced on Day 1, driving the test scenario at a speed of 59 mph (95 km/h) and maintaining a steady lane position. The presence or absence of driving impairment was interpreted by the magnitude of change in SDLP comparing drug treatment with placebo. The *a priori* non-inferiority margin (NIM) (≥1.73 in/4.4 cm increase in SDLP) was based on the mean change in SDLP seen with a 0.05% blood alcohol content, which is known to be associated with an increased crash risk. SDLP data for Day 2 and Day 6 were analyzed using marginal mixed effects models for repeated measures and symmetry analysis. Assessments of treatment safety, other EZN pharmacodynamic effects, and EZN pharmacokinetics

were also conducted and will be reported elsewhere. **Results:** The least-squares mean SDLP for both doses of EZN on Day 2 and Day 6 were significantly below the NIM ($p < 0.0001$). A small increase in SDLP with EZN 120 mg (1.819 cm, $p = 0.0034$) and EZN 240 mg (1.906 cm, $p = 0.0022$) on Day 2 compared with placebo was not seen on Day 6, suggesting emerging tolerance. The similarity of effect sizes for the two doses of EZN was consistent with established exposure-response analysis suggesting near-complete receptor inhibition at 120 mg. The significant effect of ZOP on mean SDLP on both days confirmed the assay sensitivity. **Conclusion:** EZN taken at bedtime had no clinically relevant residual effects the following day, as shown in this study of simulated driving performance, even when taken at twice the intended therapeutic dose.
Sources of Funding: The study was sponsored by Bayer

P-38.
Beyond the Physical: Shedding Light on the Psychological Toll of Perimenopause and Menopause

Andrea Donsky[1], Danielle Meitiv, M.S.[2], Lia Davidovitsch[3]. [1]Morphus, Vaughn, ON, Canada; [2]Thyroid Healing Solutions, Silver Spring, MD; [3]Lia Davidovitsch, Montreal, QC, Canada

Objective: Morphus' groundbreaking 2023 survey of the signs and symptoms of perimenopause and menopause revealed that anxiety was the fifth most common symptom experienced by the women who participated. This highlights the significant yet often overlooked impact of psychological symptoms during this transition. This research aims to further explore women's experiences with stress and anxiety levels during perimenopause and menopause, as well as the strategies they have used to manage these issues. Although anxiety is a less recognized symptom compared to physical manifestations like hot flashes and night sweats, it can have a profound impact on women's wellbeing during this time. **Design:** Women were invited to participate in the survey through the Morphus website, social media, and the company's newsletter. The recruitment is ongoing, with the data cut for analysis spanning from December 9, 2022 to April 1, 2024. The total sample size for the study was 1,277 respondents. **Results: Increased Stress and Anxiety:** 66% of respondents reported higher stress and anxiety levels compared to the past, consistent across stages. Only a minority (10%) said they are less stressed now. **Sleep Patterns:** Over half of the perimenopausal and menopausal women surveyed reported waking between 2 and 4 a.m. "like clockwork." The cited reasons included anxiety, racing thoughts, and stress, along with other common menopause symptoms like night sweats and pain. These findings align with Morphus' previous research, "The High Prevalence of Sleep Disturbances in Perimenopause and Menopause," which found that most respondents experienced sleep disturbances during these stages and identified stress and anxiety as major barriers to a good night's sleep. **Anxiety Management Strategies:** Women reported a wide range of strategies to address their anxiety and stress levels at this time, with more than half of the respondents watching funny video content, doing deep breathing exercises, and engaging in physical activity. **Conclusion:** This study underscores the significant impact of anxiety and stress on women's perimenopause and menopause experiences. The findings emphasize the need for comprehensive healthcare support to help women effectively address the often-overlooked issue of increased anxiety and stress during perimenopause and menopause.
Sources of Funding: Morphus Inc.

P-39.
The High Prevalence of Sleep Disturbances in Perimenopause and Menopause

Andrea Donsky[1], Danielle Meitiv, M.S.[2]. [1]Morphus, Vaughn, ON, Canada; [2]Thyroid Healing Solutions, Silver Spring, MD

Objective: Sleep disturbances rank as one of the top symptoms experienced by women in perimenopause and menopause, affecting more than 65% of those in this life phase. This significant issue is a key focus of research conducted by Morphus, initiated in 2022 and continuing today. **Design:** Morphus' Sleep Survey and Symptom Survey includes eleven questions and is ongoing. Participants are recruited through the research page on the Morphus website, also linked via social media and in Morphus' newsletter. Data collection continues, with cuts made at regular intervals for analysis **Results:** To date, the study has engaged 3,228 women, primarily aged between 45 and 59, uncovering the pervasive sleep disturbances that impact over 90% of participants, thereby highlighting a crucial yet often neglected aspect of women's health during menopause. The findings reveal that the primary causes of sleep disruption include anxiety and racing thoughts, frequent bathroom visits, and night sweats, experienced by 63%, 54%, and 49% of participants, respectively. Moreover, stress exacerbates these issues, with a substantial number of women reporting difficulties such as wakefulness between 2 am and 4 am, and the inability to relax enough to go back to sleep. Additionally, 27% of the respondents face significant insomnia symptoms that hinder both the initiation and maintenance of sleep. Importantly, 70% of the women in the survey have adopted some form of nightly sleep routine, suggesting a high level of awareness and a proactive approach to managing sleep quality. Despite the challenges, only a minority of women considered using prescription medication for sleep, with a strong preference for non-pharmacological solutions evident. Indeed, 65% of participants opted for supplements like melatonin and magnesium over traditional sleep medications. **Conclusion:** Through this unique survey, Morphus has not only mapped the extent of sleep disturbances among women in perimenopause and menopause but also provided insight into why these issues occur and the strategies that women are employing to try to overcome them, including a significant inclination towards supplements. This groundbreaking research emphasizes the need for personalized and multifaceted treatment strategies, reinforcing Morphus' commitment to advancing evidence-based support and empowering women to effectively manage menopause-related sleep disturbances.
Sources of Funding: This research was funded by Morphus Inc.

P-40.
The Wide Range of Symptoms of Perimenopause and Menopause and the Means By Which Women Seek Support

Andrea Donsky[1], Danielle Meitiv, M.S.[2]. [1]Morphus Inc., Vaughan, ON, Canada; [2]Thyroid Healing Solutions, Silver Spring, MD

Objective: According to the American Congress of Obstetricians and Gynecologists, every day an estimated 6,000 U.S. women, over 2 million per year, reach menopause. Research suggests that more than 80% of women experience perimenopausal and postmenopausal symptoms, which can range from mild to severe. Despite these significant numbers, there remains widespread ignorance about the full range of menopausal symptoms, which extend far beyond the stereotypical hot flashes. Many women and their healthcare providers are unaware of the extensive array of potential symptoms, resulting in not seeking the support they need. Furthermore, when help is sought, the full spectrum of symptoms are often not recognized, leading to inadequate treatment and care. To address this gap, Morphus, a company providing science-backed solutions, resources, and real-life support for women on their perimenopause and menopause journeys, conducted a comprehensive survey of over 4000 women concerning their symptoms and experience of perimenopause and menopause. **Design:** The Signs and Symptom Survey includes nine questions and is ongoing. Participants are recruited through the research page on the Morphus website, also linked via social media and in Morphus' newsletter. Data collection continues, with cuts made at regular intervals for analysis. **Results:** The Signs and Symptoms Survey currently includes responses from 4,185 women. Survey results to date have revealed that a majority of women experience a wide range of symptoms: fatigue (71%), brain fog (65.8%), sleep issues (65%), memory lapses (63.6%), anxiety (58.9%), loss of libido (57.8%), joint pain (57.5%), lack of concentration (57.2%), hot flashes (57%), loss of patience (54.7%), night sweats (53.3%), and a slower metabolism (52.5%). Overall, women have reported more than 100 symptoms associated with menopause, a greater number and wider variety than are commonly recognized by major medical and health organizations. **Conclusion:** This groundbreaking data not only provides deeper insight into the myriad symptoms of menopause but also aims to enhance the ability of women to identify when they are experiencing menopause-related symptoms. This ongoing survey, alongside ancillary studies on sleep, stress, stigma, sexual health, doctor visits, and workplace experiences, seeks to foster a deeper understanding and proactive management of menopause. Notably, 20% of respondents were uncertain about their menopausal stage, underscoring the need for more comprehensive educational efforts and enhanced symptom recognition by both women and healthcare providers to ensure appropriate support and treatment. Morphus not only aims to illuminate the common symptoms and avenues women pursue for assistance—including a marked tendency among perimenopausal women to seek advice from social media and personal networks over medical professionals—but also endeavors to empower them through a supportive community enriched by evidence-based information.
Sources of Funding: This research is funded by Morphus Inc.

P-41.
Women's Experiences with Healthcare Providers During Perimenopause and Menopause

Andrea Donsky[1], Danielle Meitiv, M.S.[2], Lia Davidovitsch[3]. [1]Morphus, Vaughn, ON, Canada; [2]Thyroid Healing Solutions, Silver Spring, MD; [3]Davidovitsch, Lia, Montreal, QC, Canada

Objective: This research aimed to gain a deeper understanding of women's experiences during perimenopause and menopause when seeking help from their healthcare providers for their symptoms. **Design:** Women were invited to participate in an ongoing online survey through the Morphus website, social media, and newsletter. The analysis included data collected from March 29, 2024 to May 20, 2024, with a final sample size of 1,050 respondents. This survey saw high engagement, with over 600 respondents choosing to provide additional information and comments. **Results:** Nearly 90% of the women surveyed discussed their symptoms with their healthcare providers. However, only 25% were identified as being in perimenopause or menopause during their first visit. Forty percent had to consult their providers two or three times, 18% needed four or five visits, and 17% required more than five visits before their symptoms were recognized as related to perimenopause or menopause. Only 10% of healthcare providers initiated discussions about perimenopause or menopause as potential explanations for their patients' symptoms or health concerns. In contrast, 75% of respondents had to introduce the topic themselves, and 15% reported that the issue was never addressed. Women who were already in menopause were more likely to get receptive responses from their providers, while those who were perimenopausal were more likely to be dismissed. **Conclusion:** These findings highlight the urgent need for increased awareness and education among healthcare providers about the signs and symptoms of perimenopause and menopause. This enhanced understanding will enable healthcare professionals to offer the essential care and support that women need during these life stages.
Sources of Funding: Morphus Inc.

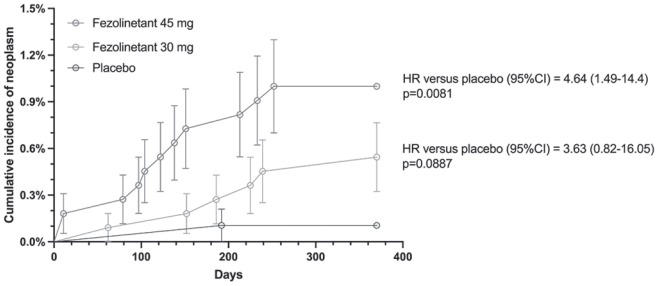
P-42.

Risk of neoplasm with fezolinetant: an analysis of the FDA Clinical Reviews

Jonathan Douxfils, PhD, Charlotte Beaudart, PhD, Jean-Michel Dogné, PhD. Clinical Pharmacology and Toxicology Research Unit, University of Namur, Namur, Belgium

Objective: The SKYLIGHT program includes three major trials—SKYLIGHT-1, SKYLIGHT-2, and SKYLIGHT-4—designed to assess the efficacy and safety of fezolinetant over periods ranging from 12 to 52 weeks. Despite initial reviews by the FDA and the EMA indicating no significant neoplasm risk during the drug development, a recent meta-analysis highlights an increased risk of neoplasms with fezolinetant 45 mg which necessitates further examination. **Design:** Data were extracted from the publicly available FDA-Clinical Reviews. Participants in SKYLIGHT-1 and SKYLIGHT-2, initially randomized to placebo, were switched to fezolinetant (30 mg or 45 mg) after 12 weeks, extending the study duration to 52 weeks. Participants in SKYLIGHT-4 were monitored for 52 weeks. Neoplasm cases reported in the FDA-Clinical Reviews were analyzed using Kaplan-Meier methods to compare the cumulative incidence of neoplasms among the treatment groups. **Results:** One, 6 and 11 cases of neoplasm were reported in the FDA-Clinical Reviews for placebo, fezolinetant 30 mg and fezolinetant 45 mg, respectively. Events occurred from 11 to 370 days post-treatment. The Kaplan-Meier analysis revealed a significant increase in the cumulative incidence of neoplasms in women treated with fezolinetant compared to the placebo group. Specifically, the hazard ratio (HR) for neoplasms was 3.63 (95% CI: 0.82-16.05; p=0.0887) for the 30 mg dose and 4.64 (95% CI: 1.49-14.4; p=0.0081) for the 45 mg dose, indicating a notable risk increase with higher fezolinetant doses. The results indicate a potential safety concern with fezolinetant, emphasizing the need for careful monitoring and further research into the underlying mechanisms contributing to this increased risk. Detailed analysis of neoplasm cases, including benign, malignant, and unspecified types, was conducted to provide comprehensive insights into the nature of these adverse events. Risk minimization strategies and baseline risk factor assessments are crucial in mitigating this identified risk. **Conclusion:** The data extracted from the FDA Clinical Reviews highlight a significant association between fezolinetant use and increased neoplasm incidence in menopausal women. This warrants further investigation to understand the potential contributive factors and underlying mechanisms to further assess a potential causality association.

Sources of Funding: None



P-43.

The Lack of Estrogenic Effects of a Novel Botanical Blend on MCF-7 Breast Cancer Cell Proliferation

Devon Bernsley, BA, Alyssa Dweck, James Komorowski. Bonafide Health, Harrison, NY

Objective: Menopausal women often experience vasomotor symptoms (VMS), including hot flashes and night sweats, due to diminished thermoregulatory control. While hormone replacement therapy (HRT) is an effective treatment, many women are looking for non-hormonal solutions. Blocking the neurokinin B (NKB) pathway is a newly discovered mechanism that works through a different route than HRT to improve thermoregulatory control. During menopause, low levels of estrogen increase NKB signaling and contribute to the occurrence and severity of hot flashes. VMS-BH02 is a proprietary natural botanical blend formulated to reduce VMS by inhibiting the NKB pathway. To determine if VMS-BH02 is estrogenic, the current study was designed to test the effect of VMS-BH02 on estrogen-positive human breast MCF-7 cells. **Design:** This study looked at the effects of VMS-BH02 on MCF-7 cell proliferation. To avoid false positive or negative effects due to cellular toxicity, cell viability assays were first conducted. Cells were seeded at a density of 2x104 cells/well in 96-well plates and incubated overnight in the respective medium at 37°C in a humidified atmosphere of 5% CO2. The cell cultures were then stimulated and exposed to different doses of VMS-BH02 and a positive control. Cell viability after 24 h was determined by Alamar Blue staining using NaF as toxic control. The proliferation of MCF-7 breast cancer cells was investigated by the Alamar Blue Assay. Cells were cultivated and then treated with VMS-BH02 for 24 and 48 hours, using serum as a control. Five different concentrations of VMS-BH02 were tested (10 µg/ml, 100 µg/ml, 250 µg/ml, 500 µg/ml, and 1000 µg/ml). **Results:** None of the five concentrations of VMS-BH02 affected cell viability. VMS-BH02 showed no significant effects on MCF-7 cell proliferation at all doses. Moreover, it showed a decrease in cell proliferation at higher doses of VMS-BH02. **Conclusion:** This study showed that VMS-BH02 was not cytotoxic and had no effect on estrogen-sensitive MCF-7 breast cancer cell proliferation. The lack of *in vitro* proliferative effects suggests a favorable safety profile for use in women who are looking for a non-hormonal option for treatment of VMS.

Sources of Funding: This study was funded by Bonafide Health, LLC.

P-44.

Lipedema - An Overview of a Complicated Hormonal Adiposity Disorder in Women: Diagnosis and Treatment in a Menopause Office VIsit

Celia Egan, MD[1], Karie Rego, JD[3], Thomas Hagopian, MD[2]. [1]True Women's Health, Grand Rapids, MI; [2]Hagopian Plastic Surgery, Altanta, GA; [3]Coverlipedema, Mill Valley, CA

Objective: Lipedema impacts at least 1 in 50 women and can cause extensive adipose tissue growth at upper and lower extremities sparing torso resulting in significant decline of function due to pain and swelling. Lipedema is hereditary and related to hormonal changes around puberty, childbirth, and menopause. Women report progressive weight gain at affected areas refarctory to lifestyle changes including dietary changes and exercise. Diagnosing lipedema early in the disease process is optimal given benefits of treatments at earlier stages. Menopause tends to be a critical time for disease progression and educating menopause providers on the diagnosis and treatment options of lipedema is imperative in providing best care for all women. **Design:** The talk will be given from the prespective of three different providers: menopause provider, plastic surgeon and patient advocate. **Results:** Learning objectives include assisting menopause specialists in diagnosing lipedema and helping patients choose safe and effective treatment options including reduction surgery. Additionally, we hope to explore the role of menopausal hormonal therapy in preventing disease progression during menopause. We hope providers will also understand the current state of insurance coverage for lipedema surgery and the requirements patients much satisfy for coverage. **Conclusion:** Lipedema is a common debilitating adiposity disease in women with progression during menopause. Providing menopause providers with education on diagnosis and treatment options will allow better treatment plans for women with lipedema and possibly expand combined research opportunities in lipedema during menopause.

Sources of Funding: None

P-45.

Loneliness is associated with subjective, but not objective, cognition in postmenopausal women

Teresa Facchetti, BSc,MSc, PhD candidate (On going)[1], Samantha A. Dargie[1], Jillian L. Joyce[2], Sarah E. Tom[1], Silvia Chapman[1], Sandra J. Rizer[1], Karen Marder[1], Stephanie Cosentino[1], Mary L. Rosser[1]. [1]Columbia University, Irving Medical Center, New York, NY; [2]University of Southern California, Los Angeles, CA

Objective: Women are more likely than men to develop Alzheimer's Disease (AD), which typically manifests in older age. However, many women also report earlier changes in cognition during the menopause transition. Subjective cognitive decline (SCD) is increasingly recognized as a critical early marker that may predict progression to AD, yet cognitive complaints have not received the same level of attention as other menopausal symptoms. Recent work has demonstrated the feasibility of introducing both subjective and objective cognitive screeners to pre, peri, and postmenopausal women during their annual well-woman visit. While strong social networks may alleviate cognitive complaints, they commonly contract as individuals age, and loneliness is associated with a decline in objective cognition. Postmenopausal women may be experiencing changes to both their cognition and social support networks. This study aims to assess whether loneliness and social engagement are associated with postmenopausal subjective and objective cognition. **Design:** A total of 86 postmenopausal participants enrolled in our study during their annual gynecological well-woman visit at the Columbia University Integrated Women's Health Program. Participants completed a tablet-based cognitive assessment, the Linus Health Core Cognitive Evaluation (CCE), which consists of three-word recall and clock drawing. CCE scores range from 0-5. They also completed a subjective cognitive survey (SCOPE) that ranges from 0-5 based on the number of items endorsed. Loneliness, social engagement and depression were assessed using three questions from the 32 item Linus Life and Health Questionnaire (1 point each). Participants also reported on education, race and ethnicity, and age at menopause. **Results:** A total of 25.9% of participants reported experiencing loneliness, while 49.4% reported active social engagement **(Table 1)**. Hierarchical regression analysis, adjusting progressively for confounding variables such as age, age at menopause, education level, race and ethnicity and depression, showed that greater loneliness is related to higher SCOPE scores in postmenopausal women (β=-0.59, p=0.03). Social engagement was not associated with SCOPE score. No association was found between either loneliness or social engagement and CCE (**Table 2**) when controlling for the same covariates. **Conclusion:** Loneliness is associated with more cognitive complaints in postmenopausal women. While social engagement was not associated with subjective or objective cognition, other facets of social support -such as perceived social isolation and social interaction quality - may serve as modifiable risk factors in this relationship. To better understand how to manage cognitive symptoms during the menopausal transition, further inquiry should include women from diverse socioeconomic and racial and ethnic backgrounds.

Sources of Funding: Alzheimer's Association, The Mary E. Groff Charitable Trust

Descriptives

	%, (n) or Mean (SD), range
Age Age at menopause	65.3 (±8.11), 52.4-84 50.5(±4.92),27-62
Race and Ethnicity (May endorse more than one)	-American Indian/Alaska Native: 1.2% (1) -Asian: 5.8% (5) -Black, African American, or African: 2.3% (2) -Hispanic, Latino or Spanish: 7.0% (6) -Black, African American, or African AND Hispanic, Latino or Spanish: 3.5% (3) -Middle Eastern or North African: 1.2% (1) -White 79.1% (68)
Education	16.8 (±2.46), 12-21
CCE score	3.95 (±1.15), 0-5
SCOPE score	0.65(±0.96),0-4
Loneliness Social Engagement Depression	0.74 (±0.43), 0-1 0.48 (±0.50), 0-1 0.12 (±0.33), 0-1

Hierarchical Regressions

Measure	Model	R2	R2adj	F (df1, df2)	p-value	Significant predictors
SCOPE	1 Age Age at Menopause	0.009	-0.01	0.39 (2,83)	0.67	None
	2 Education Race and Ethnicity	0.05	0.003	1.07 (4,81)	0.37	None
	3 Depression	0.05	-0.008	0.85 (5,80)	0.51	None
	4 Loneliness Social Engagement	0.12	0.05	1.64 (7, 78)	0.13	Loneliness (β=-0.61 p=0.02)
CCE	1 Age Age at Menopause	0.10	0.08	4.69 (2,82)	0.01	Age at Menopause (β=0.06, p=0.006)
	2 Education Race and Ethnicity	0.33	0.30	10.1 (4,80)	<.001	Age (β =-0.04, p=0.001), Race and Ethnicity (β =0.30, p <.001)
	3 Depression	0.34	0.28	5.67 (7,77)	<.001	Age (β =-0.04, p=0.002), Race and Ethnicity (β =-.30, p <.001)
	4 Loneliness Social Engagement	0.34	0.28	5.67 (7,77)	<.001	Age (β=-0.04, p=0.005), Race and Ethnicity (β =0.30, p<.001)

P-46.

Implementation of a Cancer Risk Screening and Management Program in a Concierge Family Medicine Clinic

Alexa Fiffick, DO[1], Tara Schmidlen, MS CGC[2], Laura Hayward, MS[2], Emilie Simmons[2], Moran Snir[2]. [1]Concierge Medicine of Westlake, Westlake, OH; [2]Nest Genomics, Henderson, NV

Objective: Based on reported personal and family history, a substantial portion of the population is at increased risk of developing cancer and require additional risk management. Ten percent of all U.S. women are at high risk for breast cancer and at least 4% of the US population is estimated to have an inherited cancer risk. Yet, many are unaware of their risk until diagnosed, reflecting significant gaps in routine screening. This inconsistency in cancer risk assessment underscores the urgent need for systematic risk assessment tools and long-term management strategies in routine care settings. Numerous barriers contribute to the gap in effective cancer risk management. Providers often lack the time needed to collect detailed family histories, educate patients, and stay up-to-date with evolving genetic testing guidelines. Ambiguous eligibility criteria, complex test ordering processes, and limited access to genetic expertise all further complicate matters. Additionally, the steps in this process are usually fragmented rather than integrated into electronic medical records (EMRs), which impedes the efficient identification and management of at-risk individuals. To address these challenges, Ms. Medicine, the largest women's health focused concierge primary care network in the United States, partnered with Nest Genomics to implement Nest. Nest is an EMR-integrated, HIPAA-compliant software platform designed to seamlessly incorporate genetic data into patient care, enabling clinicians and patients to better personalize care and to manage individualized risk. **Design:** Ahead of their appointment, patients receive email or text invitations and reminders to complete a cancer risk assessment via the Nest patient navigator. Nest evaluates eligibility for genetic testing using national guidelines and specific breast cancer risk models for females. Within the EMR integrated Nest app, clinicians can review and modify the patient's history, genetic testing eligibility, and recommended actions like breast MRI and chemoprevention. Clinicians can choose to order genetic testing, and Nest will send all the required information directly to the lab and return the structured results to the EMR. Nest's clinical decision support then allows clinicians to create a personalized management plan based on the patient's risk and genetic results. Nest will automatically create orders within the EMR tied to actionable steps in the approved care plan and populate the encounter note. The Nest patient navigator helps patients understand their cancer risk and adhere to their care plan. **Results:** Since implemented on January 21st 2024, the comprehensive cancer risk assessment was run on 24 patients at a new Ms. Medicine clinic in Ohio. Twenty patients were invited to Nest to complete the risk assessment ahead of their appointment. Eighteen opened the invite (90%) and of those, 15 (83%) completed the cancer risk assessment. For patients not invited ahead of visit (n=4) or invited not completed ahead of visit (n=5), a clinician ran the assessment within the Nest app in the EMR during the visit. Seven patients (7/24, 29%) received recommendations for both breast MRI and chemoprevention. Fourteen (58%) met genetic testing criteria, of those meeting criteria 9 (64%) had genetic testing ordered. Five patients have a genetic test result to date with 1 clinically actionable positive result. Nest was used to create a personalized care plan for 14 patients and of those 8 (57%) reviewed the care plan when prompted by Nest. **Conclusion:** Implementing the Nest platform in concierge family medicine settings has proven to be a feasible and effective strategy for identifying and improving the management of at-risk individuals. The use of the Nest platform helps providers overcome barriers to cancer risk management and standardizes the process for all patients. The platform and its workflows will continue to be refined based on feedback from participants and clinicians, as well as screening uptake and outcomes. Nest and Ms. Medicine plan to expand to more sites and apply the insights gained from the cancer risk assessment workflow to other specialties, such as cardiology.

Sources of Funding: None

P-47.

The novel estrogen receptor beta agonist EGX358 and *APOE* genotype influence memory, vasomotor, and anxiety outcomes in an Alzheimer's mouse model

Miranda Schwabe, M.S.[1], Aaron Fleischer, M.S.[1], Rachel Kuehn[1], Subhabrata Chaudhury, PhD[2], William Donaldson, PhD[3], Daniel Sem, PhD, JD[3], Karyn M. Frick, Ph.D., M.A[1,3]. [1]Psychology, University of Wisconsin-Milwaukee, Milwaukee, WI; [2]Chemistry, Marquette University, Milwaukee, WI; [3]Estrigenix Therapeutics, Inc., Wauwatosa, WI

Objective: Estrogen levels plummet at menopause, contributing to symptoms including hot flashes, memory loss, and increased risk of Alzheimer's disease (AD), the most common type of dementia affecting 78 million individuals worldwide. Genetic factors, such as the apolipoprotein E allele e4 (*APOE4*), contribute to at least 80% of late-onset AD cases, and older women bearing 2 copies of *APOE4* are at the highest risk of AD relative to *APOE4*+ men or those bearing 1 or 2 copies of the neural risk allele *APOE3*. Menopausal estrogen loss increases brain amyloid levels and risks of cognitive decline and dementia, however, traditional estrogen therapies carry risks of cancer due to the cell proliferative effects of estrogen receptor alpha (ERα). Estrogen receptor beta (ERβ) reduces cancer cell proliferation and enhances memory formation in rodents, suggesting that highly selective ERβ agonists may provide safer options for improving memory and alleviating hot flashes in women with AD. The highly potent and selective ERβ agonist EGX358 (>750-fold more selective for ERβ over ERα) is one of several ERβ agonists we are developing and characterizing to treat the symptoms of menopause in wild-type and AD mouse models. We previously showed that daily oral gavage of EGX358 for 3 months promotes memory and reduces the magnitude of a drug-induced hot flash in wild-type ovariectomized (OVX) female mice (Fleischer et al., 2021, Horm Behav, 130:104948). We also found that acute infusion of the highly potent estrogen 17β-estradiol (E_2) into the dorsal hippocampus promotes memory and synaptic morphology in AD mice (human *APOE*$^{+/+}$/5xFAD$^{+/-}$) mice bearing 2 copies of *APOE3* (E3FAD) or 1 copy of *APOE3* and *APOE4* (E3/4FAD), but not 2 copies of *APOE4* (E4FAD)(Taxier et al., 2022, Neurobiol Aging, 118:13-24). Although unclear why E4FAD mice are less responsive to E_2, ERα levels, but not ERβ levels, are aberrantly high in E4FADs, and ERα in the AD brain is largely non-functional, suggesting potential efficacy of selectively targeting ERβ in females with AD. Thus, the present study tested the extent to which long-term oral treatment with our novel, highly selective ERb agonist, EGX358, will enhance object recognition and spatial memory, reduce drug-induced hot flashes, and influence anxiety-like behaviors in female E3FAD and E3/4FAD mice. **Design:** Mice were ovariectomized at 5 months of age and then were treated orally with vehicle (DMSO) or EGX358 (10 mg/kg/day) via hydrogel for 8 weeks. Spatial and object memory were tested in object placement (OP) and object recognition (OR) tasks, and anxiety-like behaviors were tested in the open field (OF) and elevated plus maze (EPM). Hot flash-like symptoms (change in tail skin temperature) were measured following injection of the tachykinin receptor 3 agonist, senktide (0.5 mg/kg). **Results:** EGX358 enhanced object recognition memory in E3FAD and E3/4FAD mice but did not affect spatial memory. EGX358 also reduced senktide-induced tail temperature elevations in E3FAD, but not E3/4FAD, females. EGX358 did not influence anxiety-like behaviors or weight gain. **Conclusion:** These data indicate that highly selective ERβ agonism can facilitate object recognition memory in both *Apoe3* homozygotes and *Apoe3/4* heterozygotes, but only reduce the magnitude of a drug-induced hot flash in *Apoe3* homozygotes, suggesting that *Apoe4* genotype may blunt the beneficial effects of estrogen therapy on hot flashes. Collectively, these data suggest a potentially beneficial effect of selective ERβ agonism for memory and hot flashes in females with AD pathology, but that *APOE* genotype plays an important role in responsiveness.

Sources of Funding: Support: University of Wisconsin System Regent Scholar Award to KMF, R15GM118304 to DSS, KMF, and WAD, University of Wisconsin-Milwaukee Office of Undergraduate Research.

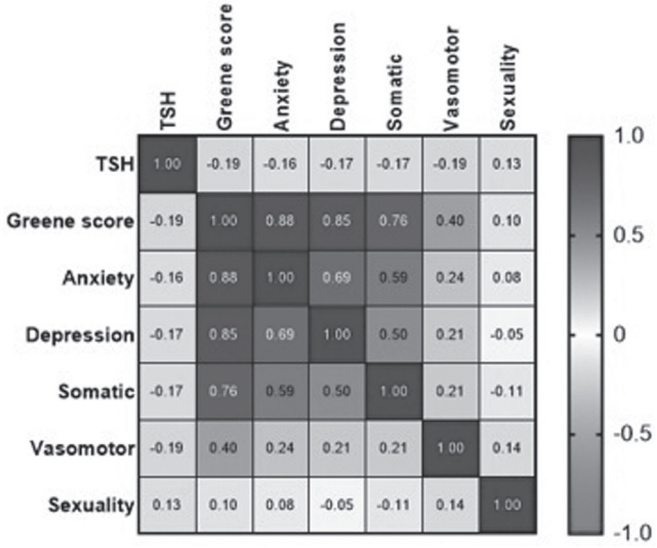
P-48.

TSH level is not correlated with menopausal symptoms and BMD on menopausal Mexican women

Selene Marysol García Luna, PhD, Juan D. Suárez Moreno, Felipe Arturo Morales Martínez, Otto Hugo Valdés Martínez, PhD, Luis Humberto Sordia Hernández, PhD, Dra. María Ofelia Sordia Piñeyro, MD, Cristina A. Ramirez Colunga. Biología de la Reproduccion, Hospital Universitario, Monterrey, Mexico

Objective: In this study, TSH levels in menopausal women were correlated according to the Greene scale, assessing the domains: Emotional, vasomotor, sexual, somatic, and psychological, as well as bone mineral density, seeking to acquire knowledge about this group, which makes it easier for us to identify patients who could benefit from treatment following more recent studies and a personalized approach. **Design:** A transversal study that included 60 menopausal women, was conducted on November 2023. The menopause symptoms were evaluated through the Greene scale. For the TSH determination, a sample of 7 ml of blood was obtained and the serum obtained by centrifugation at 3000 rpm during 10 min. The serum was then used for the TSH assessment by immunofluorescence on the ichroma II, (Boditech Med Inc.). Additionally, a peripheral BMD test was performed on the right heel of each participant using the GE Achilles Bone Densitometer. For the statistical analysis, the groups were compared with a T-test or Mann-Whitney U based on the normality of the data. The correlation between the studied variables was assessed with Sperman correlations. A p-value <0.05 was considered statistically significant. **Results:** Based on the results of the peripheral BMD, 60 participants were grouped into a normal (n=39) or osteoporotic (n=21) group. We found no significant difference in the participants ages (p=0.21) or the years from menopause onset (p=0.34). However, a significantly higher BMI was found in the normal group. We found a low prevalence of hypothyroidism (5%). We did not find a correlation between the TSH level and the T-score values (Spearman r=-0.04, p=0.75). Hence, when the osteoporosis and the normal groups were compared, we did not find a significant difference between the groups (p=0.46), with a 1.76 (IQR 1.45-3.12) and 2.46 (IQR 1.58-3.39) for the normal and osteoporosis group, respectively. In regard with the symptoms, we found a slight negative correlation between the TSH level and the Greene score. In contrast, the TSH was positively correlated with the sexuality. However, those correlations were not statistically different. **Conclusion:** A low prevalence of hypothyroidism was found in the population studied. Furthermore, we did not find a correlation between TSH levels and T-score values. However, we found a correlation between an increased BMI and osteoporosis in this population group, in terms of vasomotor symptoms, there is a slight negative correlation between the TSH level and Greene's strength, although without a statistically significant implication.

Sources of Funding: None



P-49.

Association between sleep quality and severity of menopausal symptoms

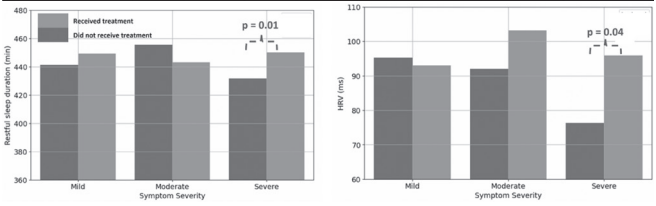
Gary Garcia Molina[1,2], Vidhya Chellamuthu[1], Susan DeFranco[1], Patrick Stark[1], Mark Aloia, PhD[1,3]. [1]Sleep Number, San Jose, CA; [2]Psychiatry, University of Wisconsin-Madison, Madison, WI; [3]Department of Medicine, National Jewish Health, Denver, CO

Objective: Poor sleep quality is common during the menopausal transition and can continue after menopause. Leveraging a smart bed platform, which can longitudinally and unobtrusively track sleep, we aimed to identify differences in sleep metrics depending on the severity of self-reported menopause symptoms in women who participated in a study conducted among Sleep Number customers. **Design:** An IRB approved survey was presented to consenting sleepers in early June 2024. Along with demographic data, survey participants were asked about menopause symptom severity and approximate date of symptom onset. For each respondent, objective sleep data for each available sleep session from reported symptom onset to six months after that date were used in these analyses. The data included sleep duration, restful sleep (ie. detected sleep with low movement level) duration, sleep quality score (1-100), mean heart rate (HR), mean heartrate variability (HRV), and mean breathing rate (BR) for each sleep session. Out of 10540 survey respondents, 730 women reported menopause symptom severity and symptom onset date. The objective sleep data of 311 respondents were available for the final analysis. Severity was categorized into three levels, mild (120 respondents), moderate (140 respondents), and severe (51 respondents). A treatment to alleviate menopause symptoms was reported by 46, 88, and 37 respondents in the mild, moderate, and severe symptom categories respectively. Kruskal-Wallis statistical tests were employed to identify significant differences in the sleep metrics among the three severity groups. For the significantly different sleep metrics, pairwise corrected Mann-Whitney tests were applied to identify the specific group differences. **Results:** Across severity groups, the Kruskal-Wallis tests resulted in non-significant differences in sleep duration, heart rate, breathing rate, and heart rate variability. However, there was a significant difference in sleep quality. The pairwise corrected Mann-Whitney tests revealed that sleep quality is significantly worse in the moderate and severe symptom groups compared to the mild symptom group (see Table 1). We have also quantified the differences in sleep metrics for women who received treatment compared to those who did not. In the mild and moderate symptom groups, there were no significant differences in sleep metrics associated with treatment. For the severe symptom group, HRV and restful sleep duration significantly improved with treatment. HRV increased by 20 milliseconds and restful sleep duration increased by 20 minutes. **Conclusion:** The severity of menopause symptoms has a significant influence on sleep quality. While sleep duration is not significantly different across symptom severity groups, the sleep quality is significantly lower in women with severe and moderate symptoms compared to women with mild menopause symptoms. Symptom alleviation treatment has a positive effect in sleep quality for the severe symptom group with notable increases in restful sleep duration of ~20 minutes and heart rate variability of ~20 milliseconds.

Sources of Funding: None

Result overview

	Mild	Moderate	Severe	Kruskal-Wallis (p-value)	Mild vs. Moderate (p-value)	Mild vs. Severe (p-value)	Moderate vs. Severe (p-value)
Age at symptom onset. Mean (Std. dev)	52.4 (14.5)	50.0 (4.05)	48.5 (5.3)	0.44	Non significant	Non significant	Non significant
Sleep Duration in minutes. Mean (Std. dev)	501.9 (136.1)	511.3 (160.1)	508.6 (152.2)	0.79	0.99	0.52	0.53
Restful Sleep Duration in minutes. Mean (Std. dev)	444.4 (118.5)	447.7 (138.4)	444.5 (136.0)	0.76	0.44	0.81	0.79
Sleep Quality Score. Mean (Std. dev)	74.1 (14.1)	71.5 (15.6)	70.0 (15.7)	0.005*	0.04*	0.002*	0.12
HR in beats/min. Mean (Std. dev)	64.0 (7.5)	64.3 (7.4)	65.0 (8.5)	0.58	0.59	0.32	0.50
BR in breaths/min. Mean (Std. dev)	15.3 (1.9)	15.3 (2.1)	15.5 (2.0)	0.57	0.34	0.97	0.44
HRV in ms. Mean (Std. dev)	94.3 (45.1)	99.0 (40.4)	90.0 (40.4)	0.71	0.69	0.62	0.40



P-50.

Retrospective analysis of the use of menopausal hormone therapy in women more than 65 years of age: first Canadian experience

Meenakshi Goel, MD[1], Kara Ly[2], Wendy Wolfman, MD[1]. [1]Obstetrics and Gynecology, Mount Sinai Hospital, University of Toronto, Toronto, ON, Canada; [2]Temerty Faculty of Medicine, University of Toronto, Toronto, ON, Canada

Objective: The average age of menopause in Canada is 51.5 years. 70-80% of women experience menopausal symptoms affecting quality of life and productivity. Vasomotor symptoms (VMS) are the most common reason to initiate menopausal hormone therapy (MHT). The average duration of VMS is 7-11 years. However, up to 40% of women in their 60s and 10-15% in their 70s continue to have vasomotor symptoms. In 2022, guidelines published by the North American Menopause Society removed the age limitation for stopping MHT. This allowed women over 60-65 years and their treating physicians to continue MHT after appropriate counselling, ruling out absolute contraindications and periodic evaluation of risks and benefits, with shared decision-making. Our study aims to examine the characteristics and motivations of Canadian women over 65 years who are still using MHT to gain further insight into this specific population. **Design:** This is a retrospective chart review of women aged 65 and above who are currently on MHT and are followed by the Mature Women's Health and Menopause clinic at Mount Sinai Hospital in Toronto, Ontario. A total of 110 women who fulfilled the inclusion criteria were analysed. Outcome measures included participant demographics, type and years since MHT usage, indications for continuation, frequency of side effects and any major or minor adverse events while on MHT. **Results:** The mean age of participants in our study was 71 years. Nearly 8% were aged 80 and beyond. The mean age of menopause was 50 years, while the mean age at which participants started MHT was 52 years. On average, participants were on MHT for 18 years, and 42% had been on MHT for 20 or more years. Reasons for initiation and continuation of MHT 80% of women experienced VMS, 57% had Genito-urinary symptoms of menopause, 39% suffered from mood

swings, 68% had sleep disturbances, and 54.5% suffered from sexual symptoms such as decreased sexual desire at the time of starting MHT. In our study, the most common reason for continuing MHT beyond 65 years was to control vasomotor symptoms (55%), followed by a better quality of life (29%) and a reduction in chronic pain and arthritis symptoms (7%). Other less common reasons included anxiety about stopping MHT. Almost 65.5% of women never tried to stop MHT due to ongoing symptoms or for better quality of life. 26.4% of women tried stopping MHT once, and only 8.2% attempted multiple times (two or more). Of the women who did stop MHT once, 87% reported that the recurrence of VMS was the main reason for restarting MHT. Type of MHT Nearly 88% of participants used a transdermal form of estrogen as part of MHT, while only 12% used oral estrogen pills. Regarding progesterone, less than 5% of participants used synthetic progestins. Side effects/Adverse events on MHT Post-menopausal bleeding was the most common side effect, as noted in 36.3% of women. While in half of the women, it was secondary to endometrial polyp, only 1 participant (0.9%) had endometrial hyperplasia. The most common adverse events were Hip or other fractures, seen in 7.3% of women. Two women had Breast Cancer while on MHT – both had Ductal carcinoma in situ (DCIS); MHT was temporarily discontinued and was restarted after 10 years of disease-free interval post surgery after consideration with an oncologist with appropriate counselling. One participant had a deep vein thrombus while on oral MHT and was shifted to the lowest dose of transdermal oestrogen while being on anti-coagulants after a discussion with the haematologist. Two women had colorectal cancer, and 1 woman had gallstone disease while on MHT. No adverse events like stroke, myocardial infarction or uterine cancer were noted. **Conclusion:** Many women beyond 65 years have validated menopausal symptoms severely affecting their quality of life and thus rely on MHT. With extensive population-based studies proving various health benefits of MHT beyond 65 years, health practitioners should be more open to considering the continuation of MHT in this age group after appropriate counselling and periodic evaluations for adverse effects/contraindications.

Sources of Funding: None

P-51.

Title: Validating the Use of Synthetic Patient Data Derivatives for Menopause Research

Isabella Gomes[1], Christopher Sorensen[1], Michelle Schneider[2], Jonathan Sanchez Garcia[2], Makeba Williams[1]. [1]Washington University in St. Louis, Saint Louis, MO; [2]MDClone, Beer Sheva, Israel

Objective: ***Objectives:*** (1) To assess whether a big-data platform with data-synthesizing capabilities (MDClone Ltd., Beer Sheva, Israel) can be used for research amongst patients diagnosed with menopause. (2) To assess differences in treatment within a synthetic cohort against the original population of patients with menopause, stratified by race/ethnicity and other demographic factors. ***Background:*** Using artificial intelligence platforms and machine learning, clinicians and researchers can derive and analyze novel synthetic data that directly reflects the statistical properties of source data without compromising patient privacy and confidentiality. While such advances in data synthesis offer the potential to address critical questions in evidence-based medicine, it is unclear whether computationally derived datasets accurately reflect the population characteristics of patients diagnosed with menopause. **Design: Design:** We generated synthetic data from the electronic health records of >190,000 patients diagnosed with menopause. >13 clinically-relevant features were selected from both datasets, including demographic factors, clinical indicators, health outcomes, and treatment modalities. Descriptive statistics were calculated, and hypothesis testing was conducted to compare the distributions between the original and synthetic datasets. Machine learning models, including logistic regression were trained on both datasets to predict outcomes and assess model performance using standard metrics. Sensitivity analyses were performed to evaluate the robustness of findings. **Results: Results:** We found that the synthetic dataset closely mirrors the statistical characteristics of the original menopausal patient population. Through rigorous validation, we demonstrate that the synthetic dataset accurately represents key demographic, clinical, and health-related attributes of menopausal individuals. **Conclusion: Conclusion:** This study showcases the effectiveness of synthetic data generation techniques in producing high-quality datasets for menopause research. The validated synthetic dataset not only facilitates privacy-preserving analysis but also enables broader access to valuable data for advancing our understanding of menopause and its associated health outcomes.

Sources of Funding: None

P-52.

An Expansive Approach to the Menopause Transition: Perspectives and Practical Considerations from Interviews in the Development of a Mind-Body Menopause Intervention

Mary K. Good, PhD[4,3], Carolyn J. Gibson[1,2], Molly Delzio[1], Caitlin Elizabeth Haas[1,5], Niah Johnson[1,5], Francesca Nicosia, PhD[3,1]. [1]SFVAHCS, San Francisco, CA; [2]Psychiatry & Behavioral Sciences, UCSF, San Francisco, CA; [3]ORH, VRHRC, Iowa City, IA; [4]VAICHCS, Iowa City, IA; [5]NCIRE, San Francisco, CA

Objective: Robust clinical trial data supports the benefit of nonpharmacologic modalities such as yoga and meditation for challenges common in the menopause transition, including mood, sleep, and some menopause- and aging-related symptoms. Over half of women Veterans in VA care fall into the age range of likely peri- and post-menopause, and addressing menopause-related care needs is a growing priority in the VA setting. A telehealth mind-body menopause program would meet an important need for a low-risk, cost-effective, and scalable program to increase access to evidence-based, gender-sensitive care for women Veterans. To inform program development, we conducted interviews with interdisciplinary subject matter experts focused on supporting a holistic health approach targeting menopause- and aging-related symptoms as well as promoting health across the lifespan. **Design:** We conducted semi-structured interviews with subject matter experts in Women's Health, Menopause and Reproductive Health, and Complementary and Integrative Health modalities. Interviews covered participants' menopause-related research and/or clinical practice, perspectives on the menopause transition, and suggestions for key components and patient-centered outcome measures for a Veteran-focused mind-body menopause program. We used a rapid analysis approach incorporating deductive categories based on goals for program development and inductive categories that emerged from team discussion of interview transcripts. This analysis focuses on participants' conceptualization of the menopause transition beyond the clinical definition and how this framework influences their research and clinical approaches. **Results:** Fifteen subject matter experts participated in interviews. Four themes emerged related to a biopsychosocial approach to menopause: (1) ebb and flow of symptoms; (2) supporting overall health; (3) competing responsibilities/demands; and (4) emergence of new identity. Interview participants discussed the experience of a range of symptoms that could vary in intensity, frequency, and presentation across time. They also emphasized the menopause transition as a time of increased focus on supporting overall health, characterizing this phase as when menopause-related changes could result in greater risk of health concerns, necessitating the need for women to prioritize habits related to sleep, nutrition, and physical activity. Recognizing the prevalence of competing responsibilities/demands at this point in the lifespan emerged especially as it relates to dual caregiver roles, where women may be simultaneously caring for dependent children and aging parents or other family members. As one participant characterized it, this stage comes at a time of "peak life complexity" for many women, with continuing caregiving responsibility at the same time as they might reach the height of their professional career. Finally, experts discussed this time as a possible emergence of new identity, as women may come to embrace a new phase of life and might enjoy greater status and freedom but might also feel grief or other emotions related to the shift in reproductive status. **Conclusion:** This interdisciplinary group of subject matter experts described an expansive conceptualization of the menopause transition. Experts described incorporating elements of social-emotional health needs alongside physical changes in their views of this transition in women's life course. These findings will inform the development of a telehealth mind-body menopause program that expands access to care and addresses biopsychosocial aspects of the menopause transition for women Veterans.

Sources of Funding: This project is funded by the Department of Veterans Affairs, Office of Rural Health, Veterans Rural Health Resource Center – Iowa City, IA NOMAD 04118

P-53.

Military Exposures and Early Menopause: Findings from the Gulf War Cohort Study

Caitlin Elizabeth Haas, BS, BA[1,2], Carolyn J. Gibson, PhD, MPH[1,2], Guichan Cao, PhD[3], Sabra Inslicht, PhD[1,2], Allison Altman, PhD[1,2], Aaron Schneiderman, PhD, MPH, RN[3], Erin Dursa, PhD, MPH[3]. [1]San Francisco VA Health Care System, San Francisco, CA; [2]University of California, San Francisco, San Francisco, CA; [3]VA Office of Health Outcomes Military Exposures, Washington, DC

Objective: Chronic stress and environmental exposures may expedite biological aging, including premature ovarian aging. Psychological and environmental stressors from military service could therefore leave women Veterans at risk for early menopause (under age 45), which is associated with negative health consequences such as fertility loss, premature mortality, cardiovascular disease, osteoporosis, sexual dysfunction, and depression. Persian Gulf War (GW) women Veterans have unique military exposures; GW deployment (1990-1991) has been linked to health difficulties not found in non-deployed Veterans of the same era. These include Gulf War illness (GWI), characterized by joint pain, gastrointestinal issues, headaches, rashes, and mood symptoms and speculated to be the result of environmental exposures such as burn pits and oil fires. Military sexual trauma (MST; sexual assault and/or sexual harassment during military service), is a common military exposure strongly associated with posttraumatic stress disorder (PTSD); both MST and PTSD have been linked to menopause symptom burden. These exposures may underlie premature ovarian aging, yet their impact on early menopause has not been formally evaluated. This study addressed gaps in understanding the relationship between military exposures and early menopause among GW women Veterans. **Design:** The GW Longitudinal Study, a population-based cohort study conducted by the VA Office of Health Outcomes Military Exposures, includes Veterans deployed to the Persian Gulf and non-deployed Veterans of the GW era. Three waves of data collection are included: an initial survey in 1995 and assessments in 2005 and 2012. The analytic sample for includes women Veteran respondents ≤45 years of age in 2012. Military exposures were drawn from the 1995 baseline (GW deployment, environmental exposures, GWI, and MST identified by self-report; probable PTSD determined by a validated measure [PTSD Checklist – Civilian Version, PCL-C); early menopause was determined by self-reported menopause at the 2012 follow-up. Descriptive analyses characterized the sample. Logistic regression models examined associations between military exposures and early menopause, adjusted for age, race, and ethnicity. **Results:** Reported demographics are from women Veterans at baseline, which included 2,013 GW deployed and GW-era women Veterans. The mean age in 1995 was 31.39 (SD 8.04). The majority were non-Hispanic White (61.1%; 31.8% non-Hispanic Black; 3.5% Hispanic, and 3.6% non-Hispanic women of other races). Respondents reported the following: environmental exposures (65%), GW illness (61%), and MST (22%); 27% met criteria for probable PTSD. Just over 5% of participants had experienced early menopause. In adjusted analyses, probable PTSD (PCL-C≥ 50) was associated with early menopause (OR 1.83, 95% CI 1.13-2.96). There were no significant associations

between GW deployment, GW environmental exposures, GW illness, or MST and early menopause. **Conclusion:** This longitudinal analysis of Gulf War women Veterans examined associations between military exposures and early menopause. Women Veterans with probable PTSD at baseline had almost two-fold odds of early menopause; one possible explanation is that PTSD is indicative not just of trauma but of symptom burden, possibly prolonging the biological sequalae associated with the stressful event. No other statistically significant associations with assessed exposures were observed. Replication in larger samples using a more detailed assessment of age at menopause is needed. This work adds to the growing body of literature implicating PTSD in adverse menopausal and reproductive health outcomes across the lifespan.
Sources of Funding: This study was supported by the Department of Veterans Affairs.

P-54.
Mind the Gap in Symptoms of Menopause: Bridging the Gap Between Current Research Efforts and Patient Prioritization of Symptoms During Menopause

Shayna Harding, DNP, NCMP, Betty Y. Wang, DO, FACP, Heather Hirsch, MD. Health by Heather Hirsch MD Collaborative, Laurel, MD

Objective: Menopause presents a unique set of health challenges and uncertainties for individuals. Despite a wealth of ongoing research addressing these changes, a noticeable disconnect exists between the prioritization of scientific efforts and actual patient reported symptoms. This study aims to identify the most pressing menopause symptoms that patients in midlife want to be studied, based on their expressed self-reported symptoms, and to examine the extent to which these symptoms are already being explored within the scientific community. **Design:** A women's health survey was conducted in November 2023 by Dr. Heather Hirsch's platform, with a diverse group of individuals in midlife to identify reported menopause symptoms of utmost importance from the patient perspective. There were 374 respondents from the survey. The identified symptoms were then compared with current research efforts in the field, as indexed using the OVID database. The search was completed on June 3rd, 2024 and peer reviewed studies were only included. The studies were within the last five years, English language, and published within the United States. Search terms utilized in the search were menopause symptoms then secondarily searching the following terms libido, joint pain, bleeding, night sweats, vaginal atrophy, depression/anxiety, brain, and hot flashes. **Results:** Survey participants reported several key symptoms as listed in Chart 1 with the order of highest reported to lowest: brain fog (269 women, 72.31%), low libido (255 women, 68.55%), joint aches and pains (252, 67.74%), vaginal dryness (213, 57.26%), night sweats (183, 49.19%), hot flashes (181, 48.66%), "other" that included weight gain, tinnitus, irritability/mood, hair loss, and sleep (126, 33.87%) and irregular or bothersome bleeding (92, 24.73%). We then cross compared the menopause symptoms that patients reported in the survey to the current research findings on these symptoms. In the OVID database search, there were 1088 publications that discussed menopause and the associated symptoms. The most common to least common symptoms were found to be: hot flashes (384 publications -35.29%), brain (209 publications 29.19%), depression/anxiety (142 publications 13.05%), vaginal atrophy (108 publications 9.93%), night sweats (102 publications 9.38%), bleeding (76 publications 6.99%), joint aches/pains (42 publications 3.86%) on joint aches and pains and finally libido (25 publications, 2.30%). Several discrepencies became obvious: for example, the second most patient-reported symptom was low libido, but there was the least amount of research found on this topic. **Conclusion:** The discrepancy between patient-reported menopause symptoms compared to current menopause research efforts reveals a significant gap in patient-reported symptoms and current menopause research. This incongruence indicates that research is lacking for the practical symptoms that women find most impactful or relevant. Our analysis shows that there needs to be more research completed on the topics of libido and joint aches and pains, since these are the most commonly reported symptoms for women but the least actively researched subject matters. Additionally, this study calls for a more patient-centered approach in the selection of research topics, advocating for a research agenda that not only addresses scientific and medical priorities, but also aligns with the relevant needs and concerns of women going through midlife.
Sources of Funding: None

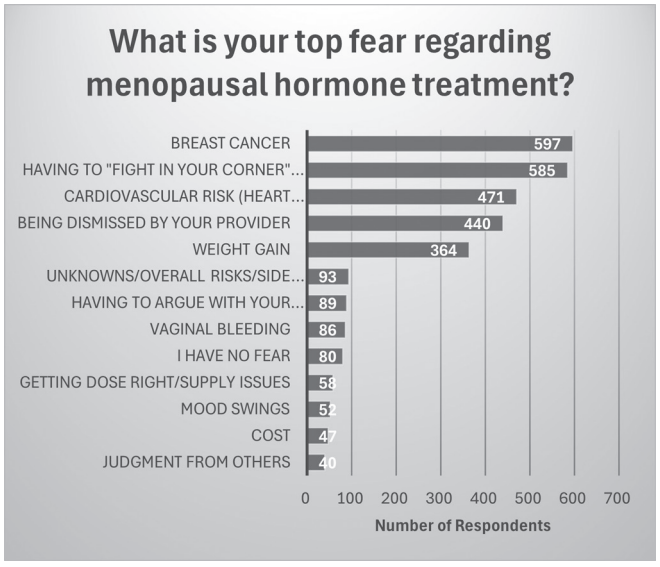
OVID CURRENT RESEARCH SEARCH OVID Search June 1 2024 Since 2019, English, USA Subject: "Menopause Symptoms..."	Number of Publications	Percent of Total Publications	Order of Most Publications
and Libido	25	2.30%	8
and Joint Pain	42	3.86%	7
and Bleeding	76	6.99%	6
and Night Sweats	102	9.38%	5
and Vaginal Atrophy	108	9.93%	4
and Depression/Anxiety	142	13.05%	3
and Brain	209	19.21%	2
and Hot Flashes	384	35.29%	1
TOTAL publications	1088	100.00%	

WOMEN'S HEALTH SURVEY RESULTS Self-reportedSymptoms by 374 Respondants Nov 2023 by Dr. Heather Hirsch	Number of Women	Percent of Total Self-Reported Symptoms	Order of Incidence
Low Libido	255	68.55%	2
MSK: Joint Aches and Pains	252	67.74%	3
Irregular or Bothersome Bleeding	92	24.73%	8
Night Sweats	183	49.19%	5
Vaginal Dryness	213	57.26%	4
Brain fog	269	72.31%	1
Hot Flashes	181	48.66%	6
Other - includes weight gain, tinnitus, irritability/mood, hairloss, sleep	126	33.87%	7

P-55.
Exploring Women's Top Fears about Menopausal Hormone Treatment in 2024: A Social Media Poll Analysis

christine A. hart kress, DNP, Rebbecca L. Hertel, DO, Aoife S. O'Sullivan, MD, Heather Hirsch, MD. Heather Hirsch MD Collaborative, Centreville, VA

Objective: The onset of menopause brings significant psychological and physiological changes in women, prompting a growing interest in midlife care. Despite its benefits, the adoption of hormone therapy (HT) has been met with apprehension, due to evolving healthcare narratives, and influenced extensive media exposure. This study aimed to assess women's current fears and experiences around HT. Design: Leveraging the reach and engagement capabilities of social media, we conducted an online poll, completed by 3033 women, from April 27 through May 12, 2024, to understand women's fears related to HT. This approach facilitated a broad and diverse participant pool of women seeking menopausal care information, ensuring a wide collection of insights. The data was analyzed to identify prevailing fears and frequencies. Results: The poll garnered 3033 responses and revealed a nuanced landscape of concerns. Thirty-one responses were unable to be categorized and were deleted. The top five fears were: 1) the risk of breast cancer (19.89%); 2) having to fight with provider during visits (19.49%); (3) cardiovascular risks (15.69%); 4) women feel dismissed by providers (14.66%); and (5) hormonal side effects such as weight gain (12.13%). Other fears were highlighted such as supply issues, getting the right dose, vaginal bleeding, arguing with the pharmacist, fears of the unknown, overall side effects and risks, mood swings, cost, and judgment from others (18.14%). While the online nature of the study may introduce biases and limit generalizability, the findings resonate with subjective clinical experiences and other studies, suggesting a representative snapshot of midlife care. Conclusion: The study underscores the critical role of healthcare providers in demystifying HT, addressing misinformation, and tailoring communication to alleviate fears. It is alarming that women report fighting for access to treatment or being dismissed. As a result, women seek support on social media and menopause telemedicine. Providers must learn nuanced menopausal care or develop referral sources. Practitioners need to identify biases, seek updated education, and reexamine a clinical approach to care based on shared decision-making. By understanding and acknowledging women's fears, providers can better support patients to navigate the complex landscape of menopausal care, optimizing their health and well-being.
Sources of Funding: None



P-56.
Treatment Gaps for the Management of Genitourinary Syndrome of Menopause

Leticia Hernandez Galan, PhD[1], Wendy Wolfman, MD[2], Alison Shea[1]. [1]St Joseph's Healthcare Hamilton, Hamilton, ON, Canada; [2]University of Toronto & Mount Sinai Hospital, Toronto, ON, Canada

Objective: To assess the incidence of GSM in women seeking care at a Canadian specialized menopause clinic and to evaluate the treatment patterns prior to consultation. **Design:** Patients attending the St. Joseph's Healthcare Menopause Clinic in Hamilton, Ontario, were invited to participate in this study to develop a perspective database of menopause symptoms. Participants (n = 501) completed a self-report questionnaire that included their medical history and validated tools for assessing bothersome symptoms related to menopause. GSM symptoms were quantified using questions from the Menopause Rating Scale (MRS), including dryness of the vagina (sensation of dryness or burning in the vagina, difficulty with sexual intercourse, and bladder problems (difficulty in urinating, increased need to urinate, bladder incontinence). Participants were asked if they were using any prescribed local (vaginal) products. **Results:** Analysis of data of 501 participants (mean age 51.6 years) attending clinics between January 1, 2021, and June 24, 2024, revealed that 41.5 % and 50.5% reported moderate to very severe bladder problems, and vaginal dryness, respectively. Overall, 13.8% of all participants were using a prescribed local therapy. Among those reporting moderate-severe GSM symptoms, 82% had not yet been prescribed targeted therapies. Female-identifying referring providers were more likely ($p<0.05$) to prescribe treatments for GSM than male providers. **Conclusion:** GSM symptoms are very common and affect women's health and quality of life, often worsening without effective therapy. We have demonstrated that most women seeking specialty care in an urban centre with GSM symptoms have not been given a trial of local vaginal therapies by referring providers despite guidelines about safety and lack of contraindications. Given very long wait times for menopause providers in Canada, improved education for both women and their providers is needed to reduce needless suffering and improve care.
Sources of Funding: Canadian Institutes of Health Research (CIHR)

P-57.

Impact of Nocturnal Hot Flashes on Sleep Duration and Efficiency in Peri- and Postmenopausal Women in a Randomized Trial of Continuous Nitroglycerin Therapy

Mingzhuo Pei, B.A.[1], Carolyn J. Gibson[2,3], Michael SCHEMBRI[4], Harini RAGHUNATHAN[5], Deborah GRADY[5], Peter GANZ[5], Alison J. HUANG[5]. [1]Medical School, Rutgers Biomedical and Health Sciences, Newark, NJ; [2]San Francisco Veterans Affairs Health Care System, San Francisco, CA; [3]Department of Psychiatry and Behavioral Sciences, University of California, San Francisco, San Francisco, San Francisco, CA; [4]Department of Obstetrics, Gynecology, & Reproductive Sciences, University of California San Francisco, San Francisco, CA; [5]Department of Medicine, University of California San Francisco, San Francisco, CA

Objective: Hot flashes, common during menopause, affect up to 80% of Western menopausal women and are reported to contribute to sleep disturbances in midlife. Few prospective data are available to confirm the specific role of hot flashes in disrupting sleep in midlife women, however, or confirm whether changes in hot flashes in response to clinical therapies result in improvement in sleep. We examined night-by-night changes in sleep duration and efficiency in peri- and postmenopausal women in a randomized trial of continuous nitroglycerin therapy for hot flashes. **Design:** We analyzed data from a randomized, double-blinded, placebo-controlled trial of continuous transdermal nitroglycerin (NTG) in peri- or postmenopausal women with hot flashes. Participants were randomized to uninterrupted use of transdermal NTG (0.2-0.6 mg/hour) or placebo for 12 weeks. Nocturnal hot flash frequency was evaluated using 7-day symptom diaries at baseline, 5 weeks, and 12 weeks. Diary data were abstracted by blinded analysts to calculate average total sleep duration, and sleep efficiency (ratio of total sleep duration to total sleep duration plus wake time after sleep onset) at each study timepoint. Mixed linear models examined changes in sleep duration and efficiency, as well as the strength of associations between nocturnal hot flash frequency and sleep outcomes, over 5 and 12 weeks, adjusting for baseline values, age, race, and ethnicity. **Results:** Among the 141 participants (mean age 54.6 (±3.9) years), the mean baseline hot flash frequency was 10.8 (±3.5) per day, including 2.6 (±1.7) nocturnal hot flashes. Average total sleep duration reported at baseline was 7.0 (± 0.9) hours, and sleep efficiency was 0.8 (± 0.1). At baseline, hot flashes were the most commonly reported reason for nocturnal awakening, with 62.6% of participants reporting waking due to hot flashes at least twice nightly. Over 5 and 12 weeks, mean nocturnal hot flash frequency decreased in both groups (NTG: -0.9 episodes/night, placebo: -1.0 episodes/night); total sleep duration increased in both groups (NTG: +0.3 hours/night, placebo: +0.1 hours/night); and sleep efficiency increased by 3% for both groups. No significant between-group differences in change in sleep outcomes were detected over 5 and 12 weeks ($P \geq .05$ for all). A reduction of one nocturnal hot flash per night was associated with a 1% improvement in sleep efficiency (P=.04). **Conclusion:** Among peri- and postmenopausal women in a randomized trial of continuous NTG therapy for hot flashes, hot flashes were the dominant cause of nocturnal awakenings. Compared to placebo, continuous NTG therapy did not result in greater improvements in sleep duration or efficiency over 5 and 12 weeks. Based on night-by-night symptom diaries and questionnaires, however, greater improvement in nocturnal hot flash frequency in both groups was associated with greater improvement in sleep efficiency. This study highlights the need for interventions to reduce the impact of hot flashes on sleep in midlife, improving health and well-being in this population.

Sources of Funding: This research was supported by National Institutes of Health (NIH) grant R01AG050588, and A.J.H. was additionally supported by NIH grant K24AG068601, but the NIH had no role in the study design; collection, analysis, and interpretation of the data; writing of the report; or and decision to submit for publication.

P-58.

Targeting estrogen receptor beta (ERβ) in astrocytes to prevent domain-specific cognitive deficits and hippocampal atrophy of menopause.

Noriko Itoh, Jaclyn Schwartz, Yuichiro Itoh, Michelle R. Lomeli, Sophia Wendin, Sri S. Somepalli, Rhonda Voskuhl, MD. UCLA, Los Angeles, CA

Objective: The majority of menopausal women develop cognitive domain specific deficits which align with brain region-specific abnormalities, and there is no neuroprotective treatment to prevent this. Here, the objective was to identify brain region-specific and cell-specific mechanisms underlying menopause induced cognitive issues and discover a treatment to prevent this neurodegeneration. **Design:** Aging female mice were examined for cognitive deficits, hippocampal atrophy by MRI, and neuropathology. The role of estrogen loss using ovariectomy, as well as the effect of selective deletion of estrogen receptor beta in astrocytes or neurons in gonadally intact female mice, were each used to determine the mechanism of neurodegeneration induced by estrogen loss at midlife. Cell-specific RNA-sequencing was used to reveal functional pathways impacted by estrogen loss at midlife. Estrogen receptor beta ligand treatment and estriol treatment were each tested for their ability to reverse neuropathology. To translate findings to humans, transcriptomics analyses were done in women before versus after menopause to determine gene expression in the key brain cell identified by preclinical studies. **Results:** Gonadectomy-induced loss of ovarian hormones in female mice at midlife, but not young age, caused hippocampal-dependent cognitive impairment and dorsal hippocampal atrophy, with glial activation and synaptic loss therein. Together, this revealed a sex hormone by age interaction in the development of cognitive deficits of menopause, namely estrogen loss and midlife aging. Deletion of estrogen receptor beta (ERβ) in astrocytes of gonadally intact females recapitulated deleterious effects of ovariectomy on these cognitive outcomes. In contrast, there was no effect when ERβ was selectively deleted in neurons, thereby revealing the importance of cell specificity, and the need for cell-specific gene deletion *in vivo* when determining the functional significance of expression of an estrogen receptor in each brain cell type. RNA sequencing and pathway analyses of gene expression in hippocampal astrocytes from midlife female astrocyte-ERβ conditional knock out (cKO) versus wild type revealed Gluconeogenesis I and Glycolysis I as the most differentially expressed pathways. An increase in *Enolase 1* gene expression was the most differentially expressed gene within these pathways. Further, an increase in Enolase 1 was found at the protein level in activated (LCN2+GFAP+) astrocytes of the dentate gyrus of the dorsal hippocampus of ovariectomized females, as well as in astrocyte-ERβ cKO, each at midlife. Treatment with either a synthetic ERβ ligand or with estriol, an naturally occurring estrogen that binds primarily ERβ, each reduced Enolase 1 levels down to normal in hippocampal astrocytes and improved cognitive test performance. Translation to humans entailed showing an increase in *Enolase 1* gene expression in hippocampal astrocytes of menopausal women as compared to women before menopause. **Conclusion:** Results are consistent with abnormal glucose utilization observed by FDG PET brain imaging in women during postmenopausal ages, Mild Cognitive Impairment (MCI), and Alzheimer's Disease (AD). Together, this suggests that loss of stimulation of ERβ in hippocampal astrocytes can be an underlying metabolic mechanism. Astrocytes regulate synaptic health and neuronal function. The majority of AD patients are women. Treatment of menopausal women with estriol to bind ERβ in astrocytes of brain, with weak off-target binding to ERα in breast, warrants future studies of whether this can reduce menopause induced cognitive deficits and hippocampal neurodegeneration in otherwise healthy women at midlife, and in turn reduce development of MCI and AD years later.

Sources of Funding: National Institutes of Health (NINDS) R35 Research Program Award (NS132150); Conrad N. Hilton Foundation (#18394)

P-59.

Comparing menopausal symptoms among pre-menopausal women after salpingo-oophorectomy, with or without hysterectomy

MICHELLE JACOBSON, MD[1], Joanne Kotsopoulos, PhD[2], Patricia Nguyen, PhD[2]. [1]Gynecology, Women's College Hospital, Toronto, ON, Canada; [2]women's college research institute, Toronto, ON, Canada

Objective: Prevention of high-grade serous carcinoma in women with a pathogenic variant in *BRCA1* or *BRCA2* includes prophylactic bilateral salpingo-oophorectomy. There is debate on whether concomitant hysterectomy should be recommended, where benefits include a decreased risk of endometrial carcinoma and the option to use estrogen-alone menopausal hormone therapy (MHT). The latter is thought to be associated with better outcomes without negatively impacting breast cancer risk. Thus, we evaluated whether concomitant hysterectomy at the time of oophorectomy is associated with superior menopause-specific quality of life (MENQOL) and sexual functioning compared with those women with an intact uterus. **Design:** Eligible participants were identified from a research program embedded within a familial ovarian cancer clinic with specialized, individualized aftercare. Data collected included completion of the previously validated MENQOL-intervention questionnaire and Sexual Activity Questionnaire (SAQ), prior to and one-year following surgery. Change in menopausal symptoms after oophorectomy, by hysterectomy status, and by MHT use were compared using a paired or Student's *t*-test, respectively. **Results:** There were 148 women who underwent an oophorectomy prior to natural menopause; 76 (51%) with and 72 (49%) without a concomitant hysterectomy. Overall, there was no difference in MENQOL and SAQ scores based on hysterectomy status. Among women who *had a* hysterectomy, there was a significant worsening in vasomotor and sexual symptoms, irrespective of MHT use (add change and p values). Among women who *had a hysterectomy and used MHT* (n=35), the increase in vasomotor symptoms was significantly higher than that experienced by the *no hysterectomy/MHT* (n=51) comparator group (score of [NP3] 1.27 vs. – 0.14; $P = 0.0003$). Overall, premenopausal women did not experience a significant decline in quality of life regardless of MHT use and/or hysterectomy status. There was no significant decline in any of the MENQOL or SAQ domains among women who were postmenopausal at surgery (n = 59; 37 with vs. 22 without hysterectomy), irrespective of hysterectomy status ($P \geq 0.05$). **Conclusion:** The worsening vasomotor and sexual symptoms domain with hysterectomy requires further study, but do not support the belief that estrogen alone MHT leads to better outcomes than combination therapy. Overall, menopause and sexual activity did not change significantly if comcomitant hysterectomy was included in premenopausal carriers underoing risk reducing surgery.

Sources of Funding: None

P-60.

Menopausal Hormone Therapy Use Among Active Duty Service Women

Miranda L. Janvrin, MPH[1,2], Amanda Banaag, MPH[1,2], Jill Brown, MD, MPH[3], Katerina Shvartsman, MD[3], Tracey P. Koehlmoos, PhD, MHA[2]. [1]The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., Rockville, MD; [2]Preventative Medicine and Biostatistics, Uniformed Services University of the Health Sciences, Bethesda, MD; [3]Gynecologic Surgery and Obstetrics, Uniformed Services University of the Health Sciences, Bethesda, MD

Objective: Menopausal hormone therapy (MHT) has been shown to be effective in alleviating symptoms of menopause. Previous literature has described the frequency of MHT use for the relief of menopausal symptoms in both the general and veteran female populations. Our objective was to describe this frequency within the female active duty population. **Design:** We used the Military Health System (MHS) Data Repository (MDR) to conduct a cross-sectional study of active duty service women (ADSW) ages 45 to 64 in the U.S. Army, Air Force, Navy, and Marine Corps during FYs 2018 to 2022. Service women in the Coast Guard, Public Health Service, National Guard, and Reserves were excluded due to their inconsistent access to the MHS. Transgender women were identified and excluded. Study analyses included descriptive statistics on patient demographics and MHT type. Unadjusted and adjusted logistic regressions were

performed to assess for significant associations of patient demographics on receipt of systemic MHT. **Results:** We identified a total of 13,629 ADSW ages 45 to 64 on active-duty service in the U.S. Army, Air Force, Navy, and Marine Corps during FYs 2018 to 2022; of whom 1289 (9.5%) received systemic MHT. Of those receiving systemic MHT, 294 (21.2%) had a history of a hysterectomy. Of those who received MHT during the study period, the majority were 45 to 49 years old, White, in a Senior Officer rank, and in the Army. The most common form of MHT prescribed was transdermal therapy (34.6%), closely followed by estrogen (only) pill (34.0%) and estrogen+progestin pill (31.2%). **Conclusion:** The prevalence of MHT use among ADSW ages 45 to 64 (9.5%) is lower than MHT use among the U.S. veteran population over age 45 (10.3%), but higher than among the U.S. general population over age 45 (4.7%).

Sources of Funding: This work was funded through a Defense Health Agency grant #HU00012320021.

P-61.

Formalized Educational and Preceptorship Training in Menopause Management Leads to Improved Compliance and Adherence with Hormonal Therapy

Michael Krychman[1], Natalie Souzzi[2], Michelle Nezolosky[2], Sunbal (Somi) Javaid, MD[2]. [1]So Cal Center for Sexual Health, Newport Beach, CA; [2]HerMD, Cincinnati, OH

Objective: Research has shown that lack of compliance and adherence to menopause hormone therapy (HT) is common, with select literature demonstrating adherence rates between 45-69% after 3 months. For patients, the controversial history surrounding menopause hormone therapy, self-reported feelings of being rushed or dismissed by healthcare professionals, and lack of menopause education may be a few of the various factors that drive suboptimal menopause hormone therapy adherence rates. Similarly, many healthcare professionals (HCP) report a lack of formalized menopause education, with recent research showing only 31% of obstetrics and gynecology residency program directors reporting menopause education being included as part of their residency curricula. While gaps in menopause education for healthcare professionals have persisted over time, the need for formalized menopause education and training pathways remains unmet. HerMD, a comprehensive network of women's healthcare centers specializing in menopause and sexual health, has developed HerMD University, a formalized, education platform providing specialized learning opportunities specifically within the menopause and sexual health clinical spaces. Through HerMD University, all HCP participate in formalized education and training opportunities, inclusive of proprietary algorithms of care and demonstrated proficiency metrics, clinical lectures by menopause luminaries, formalized support and preceptorship, case studies, journal club sessions, real-time clinical support, bibliotherapy, and access to a current research article repository. Specialty clinical education and training, ongoing clinical support, and routine "touchbase" sessions with medical leadership, coupled with prolonged clinical visit times of up to 40-minutes, allow for detailed discussions, counseling, and risk mitigation in the setting of HT administration. **Design:** During the study period from January 1-April 19, 2023, a retrospective chart review of a random convenience sample from two HerMD legacy centers was performed to assess the clinical compliance of patients who received comprehensive treatment for the management of hot flashes. Treatment interventions and symptom resolution were evaluated. All data were collected and stored in a private, HIPAA-protected database. **Results:** A convenience sample (n=56) from two HerMD legacy centers were assessed for individuals who reported experiencing hot flashes during menopause. The mean age of the individuals in the final analysis was 51.3 years (range 30-73). Associated menopausal symptoms included: brain fog/memory issues (66%), sleep disturbances including insomnia (59%), decreased libido (49%), weight management concerns (38%), vaginal dryness (31%), and dyspareunia (14%). A family history of breast cancer was present in 18% of the sample. Treatment modalities included: behavioral intervention counseling (100%), over-the-counter supplements (3.5%; n=2) and systemic hormonal therapy (96.5%; n=54). 100% of patients with a family history of breast cancer received hormonal therapy. Overall, 96% of patients responded to their intervention with self-reported improvement in hot flashes and associated symptomatology at scheduled follow-up visits. Only 5% of patients (n=3) reported adverse effects (minimal vaginal spotting). Patient compliance and adherence to their therapeutic regimen was 100% at 3-months. **Conclusion:** In this small retrospective study, patient compliance and adherence to menopause hormone therapy was noted to be improved to 100% in individuals self-reporting hot flashes and also receiving treatment to address their symptomatology. All patients underwent multiple in-office and telehealth visits at specialized centers to ensure dose optimization, efficacy of symptom resolution, and to ensure no emergent adverse effects from therapy. Through specialized menopause education, training, and support, coupled with extended 40-minute menopause clinical visits, close clinical surveillance, and safe and inviting centers, clinical care of the menopause patient can be optimized and superior outcomes established.

Sources of Funding: NONE

P-62.

Provider Perceptions of Menopause Care in Primary Care, Obstetrics & Gynecology, and Endocrinology

Athavi Jeevananthan, MD[1], Anastasia-Stefania Alexopoulos, MBBS[1,2], Karen M. Goldstein, MD MSPH[2,3], Anna C. Moreno, DO[4]. [1]Endocrinology, Duke University Medical Center, Durham, NC; [2]Center of Innovation to Accelerate Discovery and Practice Transformation (ADAPT), Durham VA Medical Center, Durham, NC; [3]General Internal Medicine, Duke University Medical Center, Durham, NC; [4]Obstetrics and Gynecology, University of Utah Health, Salt Lake City, UT

Objective: To describe and compare current attitudes, practices, barriers, and needs in provision of menopause care across multiple specialties. **Design:** An anonymous Qualtrics survey was emailed to providers in Primary Care, Obstetrics & Gynecology, and Endocrinology at Duke University and the University of Utah from January 4, 2024 to February 14, 2024. The survey was created in collaboration with a multidisciplinary provider team, representative of all the surveyed specialties, and a survey methodology expert. **Results:** The survey was completed by 238 providers out of the 1326 invited, for a response rate of 18%. Out of the respondents, data analysis was performed on the 201 physicians, nurse practitioners, and physician assistants who completed the entire survey. Of these providers, 51% (102/201) were Primary Care providers (PCPs), 28% (57/201) were Obstetrics & Gynecology providers (OB/GYNs), and 21% (42/201) were Endocrinologists. Most were physicians (71%, 142/201), and in their first 10 years of practice (52%, 104/201). The respondents indicated the following specialties as being responsible for provision of menopause care at the following frequencies: 83% (166/201) Primary Care, 96% (193/201) OB/GYN, and 40% (81/201) Endocrinology. Most PCPs (92%, 94/102) and OB/GYNs (95%, 54/57) reported providing care for symptomatic menopause, while only 38% (16/42) of Endocrinologists reported the same. The type of menopausal care provided also varied across specialties; 100% (54/54) of OBGYNs offered menopausal hormone therapy (MHT), compared to 78% (73/94) of PCPs and 75% (12/16) of Endocrinologists. Provision of non-hormonal prescription therapy was reported by 93% (87/94) of PCPs, 93% (50/54) of OBGYNs, and only 50% (8/16) of Endocrinologists. Of the respondents, 83% (166/201) noted that it is appropriate to treat symptomatic menopause with any distressing symptoms, though only 72% (144/201) would treat with MHT. For primary ovarian insufficiency (POI), only 64% (129/201) always found it appropriate to treat with hormone therapy with specialty differences in frequency – 45% (46/102) of PCPs, 82% (47/57) of OB/GYNs, and 86% (36/42) of Endocrinologists. Most frequently reported barriers to provision of menopause care were lack of training (62%, 124/201), lack of time for in-depth risk-benefit analysis (57%, 115/201), lack of clinical toolkit to streamline discussion (52%, 105/201), and patients' safety concerns about available treatment options (52%, 104/201). Most frequently reported ways to improve provision of menopause care were training for providers (92%, 184/201), clinical toolkit to guide decision-making (76%, 152/201), targeted dissemination of education material for patients around the time of menopause transition (58%, 116/201), and multidisciplinary clinics (51%, 102/201). **Conclusion:** Current practices in provision of menopause care were notably different based on specialty. The highest perceived ownership of menopause care is in OB/GYN followed by Primary Care, though surprisingly, 40% of providers perceived Endocrinologists as co-owners of this niche of care. The greatest barriers to providing care across the specialties were: lack of training, time and clinical tools, and patient hesitation. There is a clear consensus among respondents that we need to improve menopause care training for providers and need clinical tools for effective patient-provider communication regarding treatment options.

Sources of Funding: None

P-63.

Comparaive Effectiveness of Levonorgestrel Intrauterine System and Dydrogesterone in the Treatment of Abnormal Uterine Bleeding during Perimenopause.

Xiuxiu Jiang, MD, Ph D, Xingmiao Li, MD, Ning Wang, MD. Women's hospital, School of Medicine, Zhejiang University, Hangzhou, China

Objective: To compare the effectiveness and safety of levonorgestrel intrauterine system and dydrogesterone in the treatment of abnormal uterine bleeding (AUB) during perimenopause. **Design:** A total of 600 patients with perimenopausal AUB admitted to our hospital from August 2022 to August 2023 were selected and randomly divided into two groups of 300 patients each. Inclusion criteria: Patients should meet the relevant diagnostic criteria for perimenopausal AUB in the 9th edition of "Obstetrics and Gynecology" ; have menstrual abnormalities, vaginal spotting, and other symptoms; be in the perimenopausal period; and be informed and willing to participate in the study. Exclusion criteria: Patients who have recently used hormones; patients allergic to the drugs used in this study; patients with coagulation dysfunction; and patients with poor function of important organs. The patients were divided into a control group (300 cases) and an observation group (300 cases) using a random number table method. Both groups of patients began treatment 15 days after diagnostic curettage, with pathological confirmation of non-abnormal endometrial lesions. The control group was treated with dydrogesterone, while the observation group was treated with LNG-IUS. Both groups were treated continuously for 3 months. The primary outcome is the symptoms of abnormal uterine bleeding. The secondary outcomes are sex hormone levels. Median (IQR) of continuous variables and the frequency (%) of categorical variables were assessed respectively. Continuous variables were compared between the two groups by the Mann-Whitney U test. Categorical variables were compared by the chi-square test. The significance level was set at a two-sided α=0.05. **Results:** There were no statistically significant differences in baseline characteristics between the two groups of patients. The total effective rate of treatment in the observation group was

significantly higher than that in the control group, and the incidence of adverse reactions was significantly lower than that in the control group ($P < 0.05$). After treatment, the levels of E2, LH, and FSH in the observation group were significantly lower than those in the control group ($P < 0.05$). **Conclusion:** Compared with dydrogesterone, LNG-IUS in the treatment of perimenopausal AUB patients can better regulate sex hormone levels, with significant hemostatic effect, and does not increase adverse reactions.

Sources of Funding: Supported by 4+X Clinical Research of Women's Hospital, School of Medicine, Zhejiang University (ZDFY2023-4XPY101).

Table 1. Comparison of Clinical Therapeutic Effects between the Control Group and the Observation Group

	N	Significantly effective	Effective	Ineffective	General effective
Groups, n(%)					
Observation group	300	180 (60.0%)	106 (35.3%)	14(4.7%)	286(95.3%)
Control group	300	150 (50.0%)	85 (28.3%)	65(21.7%)	235(78.3%)
χ	-	-	-	-	5.15
P-Value	-	-	-	-	0.023

Table 2. Comparison of Sex Hormone Levels Between the Observation Group

Time	Groups	N	E2(pmol/L)	LH(U/L)	FSH(U/L)
Before treatment	Observation group	300	486.28±14.43	11.84±2.43	13.05±3.28
	Control group	300	487.85±14.67	11.78±2.35	12.97±3.24
	t		0.489	0.114	0.111
	P		0.627	0.910	0.912
After 3 months of treatment	Observation group	300	243.62±9.52	8.02±1.48	9.11±1.65
	Control group	300	299.74±11.68	9.05±1.87	10.05±1.77
	t		23.848	4.914	4.506
	P		0.000	0.000	0.000

P-64.

Novel Proteomic Markers for Postmenopausal Cardiac Risk

Basant Katamesh[1], Mary Whipple[2], Christopher Anstine[1], Abhinav Singla[1], Abdul Rhman Hassan[3], Mohamed Abuelazm[4], Sanjeev Nanda[1], Ann Vincent[1], Bright Thilager[1]. [1]Mayo Clinic, Rochester, MN; [2]University of Minnesota, Minnesota, MN; [3]Wayne State University, Detroit, MI; [4]Tanta University, Tanta, Egypt

Objective: Understanding the risk factors that influence cardiovascular health in postmenopausal women is an evolving field of research. Proteomics has shown promise for predicting cardiovascular risk risk factors such as hypertension and hyperlipidemia and in the early identification of cardiovascular disease. Studies also suggest that changes in proteomic patterns from the peri-to-postmenopause transition may be tools for early prediction and detection of cardiovascular disease in this demographic. We aimed to identify and summarize significant proteomic markers associated with cardiovascular disease and risk factors in postmenopausal women. **Design:** A systematic review of proteomic studies related to cardiovascular diseases in postmenopausal women was carried out through a search of databases including PubMed, Google Scholar, Cochrane, Elsevier, and ScienceDirect till December 2022. Data on all proteins significantly associated with any cardiovascular conditions was abstracted. Using the Covidence tool for systematic reviews, three independent reviewers assessed and confirmed the abstracted data. Risk of bias was assessed using the AHRQ questionnaire. **Results:** Of 253 studies, 5 (3 case-control, 2 cohorts) met inclusion criteria. Our review identified approximately 200 proteins and pathways significantly associated with multiple cardiovascular conditions (Table 1). Proteins such as Beta-2-microglobulin (B2M), Insulin-like growth factor binding protein (IGFBP), and apolipoproteins were reported to be significantly associated with cardiovascular diseases across multiple studies. **Conclusion:** Our systematic review identified a variety of proteins and pathways linked to cardiovascular disease in postmenopausal women. These included proteins that were associated with or were indicators of cardiovascular disease and predictors of cardiovascular risk factors such as hypertension and hyperlipidemia. Notable among these were B2M has been reported to be associated with both coronary artery disease and peripheral arterial disease, Apolipoproteins have been reported to be associated with the severity of plaque buildup, and IGFBP has been associated with atherosclerosis. Future studies focusing on proteomic biomarkers in postmenopausal women have the potential for early disease detection and identify individuals at increased risk thereby implementing preventive strategies.

Sources of Funding: None

Significant proteins and pathways identified in cardiovascular disease in postmenopausal women

Author, Year	Study Design	Significant Proteins and Pathways	Conclusions
Prentice 2010	Case-Control	37 proteins identified: B2M, Orosomucoid 1, and IGFALS were the most significant. Mitogen-activated protein kinase signaling, Glycolysis, and gluconeogenesis metabolic pathway	Proteins are potential markers for cardiovascular disease detection in postmenopausal women
Prentice 2013		B2M, IGFBP1, Thrombospondin 1, and Complement Factor D significantly correlated with lipid markers and blood pressure	Proteins are novel risk predictors for hyperlipidemia and hypertension and may be useful in early disease detection
Jin 2019		Five Apolipoproteins - Apolipoprotein AI, CI, CII, CIII, and CIV predicted cholesterol efflux capacity and cardiovascular disease	Apolipoprotein influencing cholesterol efflux capacity were predictive of cardiovascular disease
Lau 2019	Cohort	Several biomarkers were differentially associated with incident cardiovascular disease events, including Apolipoprotein B, Cluster of differentiation (CD) 18, Growth Differentiation Factor 15, CD14, and pro-basic platelet protein Platelet/coagulation homeostasis pathway Fibrosis pathway Inflammation pathway	Proteins and pathways linked to cardiovascular disease differ in pre/post-menopausal women and could be predictive disease markers
Appiah 2022		38 proteins significantly altered between pre and postmenopausal women at baseline Atherosclerosis signaling pathway Iron homeostasis signaling pathway Ferroptosis Signaling Pathway	Longitudinal changes in plasma proteins between pre- and postmenopausal may help identify diseases in the postmenopausal period

P-65.

Nutrition Education and Art- and Dance/Movement Therapy for Postmenopausal Women with Weight Concerns

Rebekka M. Dieterich-Hartwell, PhD, Deeptha Sukumar, PhD, Girija Kaimal, EdD MA ATR-BC. College of Nursing and Health Professions, Drexel University, Wyncote, PA

Objective: Although menopause is an inevitable stage of life for all women and by 2030, 47 million worldwide will be menopausal, this transition is not given sufficient attention and particularly overweight postmenopausal women are a largely ignored group. Meanwhile, postmenopausal women with an elevated BMI are at risk for cardiovascular disease. Moreover, hormonally driven changes may cause higher levels of anxiety, depression, and exhaustion, and the loss of reproduction and self-identity, along with other life stressors, can have negative impacts on quality of life. In order to address both the physical and psychosocial health needs of this population, we developed an integrative and innovative approach named I2CAN (Integrative Intervention with Creative Arts and Nutrition), consisting of nutrition education (NE) and creative arts therapy sessions (CAT) (art therapy, dance/movement therapy, and therapeutic writing). The aims are to determine how and to what extent this combined approach will 1. significantly reduce cortisol, sPTH (serum parathyroid hormone), and inflammatory cytokines and 2. significantly enhance psychosocial **Design:** In this 16-week mixed methods randomized controlled trial, participants are being assigned to either a control group or an intervention group (8 weeks of NE and 8 weeks of CAT, alternating weekly). Both groups take place on a virtual platform with sessions lasting between 45 minutes (NE) and 60 minutes (CAT). On average each group has between four and six participants. The NE portion includes goal setting and 15 separate topics that focus on caloric restriction and health and wellness The 8 CAT sessions address four psychosocial areas, quality of life, emotional regulation, body image, and stress management and include an introduction to the theme, a movement warm-up relating to the theme, an art therapy directive relating to the theme, a movement cool-down, and a time of verbal processing and takeaways. Prior to the first session, participants in the intervention group are receiving art materials as well as a box with both art, journaling, and movement prompts, separated by the four different themes. These prompts are reiterated at the end of the CAT sessions to encourage participants to engage in new and positive daily habits. Quantitative outcome measures are being collected from all participants at baseline and at the completion of the study and include biochemical markers and a battery of psychosocial assessments. Qualitative data in form of clinical notes, narrative responses, observations, and photographed artwork are gathered throughout the study and individual semi-structured interviews are scheduled with the participants in the intervention group at the end of the study to learn about their overall experiences. All quantitative analyses are being conducted through SPSS. The qualitative data is analyzed using a thematic analysis method. The data is then merged through cross tabulation and a joint display. **Results:** While this randomized controlled trial is currently underway, we do have preliminary results from a pilot that took place in 2022 and only included a small intervention group that received 8 sessions of NE and 8 sessions of CAT over the course of 16 weeks. Due to regulatory limitations during the COVID-19 pandemic, the physiological measures (DXA and blood draws) could also not be collected. Nevertheless, based on the survey responses, the participants improved in the areas of quality of life, affect, self-efficacy, stress, anxiety, and body image, and also reported physical improvements (decreases in BMI and blood pressure) by the end of the study. Through the interviews, we learned that the participants appreciated having a special time set aside that permitted mindful art, writing, and movement experiences. They were able to connect with one another and share personal experiences in a small intimate setting (3 participants, 2 therapists). **Conclusion:** These preliminary findings are promising and suggest that this integrative and innovative approach is beneficial for psychosocial wellbeing and weight management for overweight postmenopausal women. More research is necessary to substantiate these results and with the current study in progress, new findings will be forthcoming.

Sources of Funding: Cell2Society PA Dept of Health CURE grant

P-66.

Proteomic Biomarkers of Breast Cancer in Postmenopausal Women

Basant Katamesh[1], Christopher Anstine[1], Bright Thilager[1], Abdul Rhman Hassan[3], Mohamed Abuelazm[4], Mary Whipple[2], Sanjeev Nanda[1], Ann Vincent[1], Abhinav Singla[1]. [1]Mayo Clinic, Rochester, MN; [2]University of Minnesota, Minnesota, MN; [3]Wayne State University, Detroit, MI; [4]Tanta University, Tanta, Egypt

Objective: Breast cancer is the most common cancer and the leading cause of cancer-related deaths in postmenopausal women. Current diagnostic modalities for breast cancer include mammography, ultrasound, magnetic resonance imaging, and molecular breast imaging. However, these modalities only detect disease after it is established. Targeted therapies, including protein-specific ones, have led to successful treatment options. However, utilizing proteomics as a diagnostic and prognostic tool has not been fully explored. We believe this may be a valuable tool for identifying high-risk women before disease onset and establishing an accurate prognosis. Our **objective** was to review and summarize key proteomics markers identified in studies of breast cancer in postmenopausal women. **Design:** A systematic review of proteomic studies related to breast cancer in postmenopausal women was conducted by searching PubMed, Google Scholar, Cochrane, Elsevier, and ScienceDirect. Using the Covidence tool for systematic reviews, three independent reviewers assessed and confirmed the data. Risk of bias was assessed using the AHRQ questionnaire. All proteins that were significantly associated with breast cancer in these studies were extracted. **Results:** Of 253 studies identified, 5 studies met the inclusion criteria. The 5 studies identified included 3 case-control studies and 2 cohort studies, which yielded over 200 significant proteins and pathways (Table 1). These included CLIC1 associated with vascular repair and angiogenesis, Sialyl Lewisx associated with invasive breast cancer, Cytokines 3, 5, and TM peptide associated with aggressive cancer including metastasis, IL-8 which has been reported to be associated with poorer prognosis, and EGFR an established growth factor receptor that has known association with breast cancer. **Conclusion:** The results of our study suggest that proteomic biomarkers hold promise for early detection, diagnosis, prognosis, and staging of postmenopausal women with breast cancer. Prospective diagnostic and validation studies of proteomic markers are necessary before proteomics can be implemented in clinical practice. The implementation of proteomics has the potential to enhance diagnostic accuracy and reduce the need for invasive procedures, indicating a significant advancement in the detection and management of breast cancer in this population.

Sources of Funding: None

Significant proteins and pathways identified in breast cancer in postmenopausal women

Author, Year	Study Design	Significant proteomics identified	Conclusion
Katayama 2019	Cohort	Chloride intracellular channel 1 (CLIC1), limbic system-associated membrane protein (LSAMP), and microtubule-associated protein RP/EB family member 1 (MAPRE1) were significantly associated with triple-negative breast cancer independent of tumor stage, grade, size, and menopausal status	Genes may be prognostic indicators in breast cancer and can aid personalized treatment decisions
Henderson 2019		A combinational proteomic biomarker demonstrated a negative predictive value of 98% with a sensitivity of 93% when combined with clinical data in patients with breast cancer	Specific proteins are upregulated in breast cancer and may be potential biomarkers
Carlsson 2008	Case-Control	Nine proteins were dysregulated in patients with breast cancer (sialyl Lewisx, C3, C4, C5, IL-8, Transmembrane (TM) peptide, IL-5, IL-7, and Monocyte Chemotactic Protein 3 (MCP-3)).	
Pitteri 2010		Epidermal Growth Factor Receptor (EGFR) was significantly elevated in patients with breast cancer	EGFR may be a potential proteomic biomarker for the detection of breast cancer
Li 2011			

P-67.

Proteomic Insights in Postmenopausal Osteopenia and Osteoporosis

Basant Katamesh[1], Abhinav Singla[1], Abdul Rhman Hassan[2], Mohamed Abuelazm[4], Mary Whipple[3], Christopher Anstine[1], Bright Thilager[1], Sanjeev Nanda[1], Ann Vincent[1]. [1]Mayo Clinic, Rochester, MN; [2]Wayne State University, Detroit, MI; [3]University of Minnesota, Minnesota, MN; [4]Tanta University, Tanta, Egypt

Objective: Osteopenia and osteoporosis are significant health concerns in postmenopausal women. The DEXA scan is the gold standard for diagnosis; however, it can only detect these conditions after disease onset. In contrast, proteomics can potentially identify disease-specific proteins associated with osteopenia and osteoporosis before disease onset and may be a tool to identify at-risk patients. Our **objective** was to review and summarize key proteomics markers identified in studies of postmenopausal women with osteopenia and osteoporosis **Design:** A systematic review of proteomics in postmenopausal women with osteopenia and osteoporosis was conducted in databases including PubMed, Google Scholar, Cochrane, Elsevier, and ScienceDirect. Using the Covidence tool for systematic reviews, three independent reviewers assessed and confirmed the data. Risk of bias was assessed using the AHRQ questionnaire. Data were extracted on all proteins significantly associated with osteopenia and osteoporosis. **Results:** Of 253 studies, 10 met inclusion criteria. Our study identified several significant ($p<0.05$) proteins associated with low bone mineral density (BMD) in postmenopausal women (Table 1). Notable among these include, VDBP, a protein associated with low BMD, SSP24 and IL-6R associated with bone metabolism, RAB7A associated with regulation of osteoclast function, and TSP1 associated with bone formation and activity of osteoblast and osteoclast. **Conclusion:** Our findings underscore the potential for proteomics in the early detection and risk stratification of osteopenia and osteoporosis in postmenopausal women. Proteins associated with low BMD provide insight into the complex mechanisms of osteoblast and osteoclast function and other mechanisms involved in bone metabolism. Further research into these proteins and validation studies can facilitate the creation of more accurate risk prediction models for osteopenia and osteoporosis. This could transform personalized treatment strategies for low BMD, resulting in better patient outcomes and reduced prevalence of these conditions.

Sources of Funding: None

Significant proteins and pathways identified in postmenopausal osteopenia and osteoporosis

Author, Year	Study Group	Significant proteins and Pathways	Conclusion
Soh 2022	Osteoporosis	-Platelet-derived growth factor-BB -IL-6R -tissue inhibitor of metallopeptidase-2	Candidate proteomics can serve as biomarkers for osteoporosis
Zhang 2016		Seven genes/proteins were dysregulated in the postmenopausal low-BMD group, these included: - Peptidylprolyl isomerase A - Similar to peptidylprolyl isomerase A isoform 1 - Transgelin 2 - Isoform Long of 14-3-3 protein beta/alpha - Lamin B1 - Annexin A2-like protein Annexin A	
Daswani 2015		Heat shock protein 27 (HSP27) and phosphorylated Heat shock protein 27 (pHSP27) were up-regulated in pre and post-menopausal women with osteoporosis	
Shi 2017		Four candidate proteins were upregulated in postmenopausal women with osteoporosis: - Ras-related protein Rab-7a (RAB7A) - Thrombospondin-1 (TSP1) - Growth arrest-specific protein 6 (GAS6) Secreted phosphoprotein 24 (SPP24)	
Li 2013		Protein peaks 3167.4, 4071.1, 7771.7, and 8140.5 m/z had the highest discriminatory power to discriminate between postmenopausal women with and without osteoporosis	Specific protein peaks had discriminatory power to identify osteoporosis
Shi 2015		Protein peaks 8909.047, 8690.658, 13,745.48, and 15,114.52 m/z had the highest discriminatory power to discriminate between postmenopausal women with and without osteoporosis	
He 2016	Osteopenia	Protein peaks 1699 and 3038 (Secretin) m/z had the highest discriminatory power to discriminate between postmenopausal women with and without osteopenia	Specific protein peaks had discriminatory power to identify osteopenia
Martinez-Aguilar 2019	Osteoporosis and Osteopenia	Vitamin D-binding protein (VDBP) and Ceruloplasmin difference between controls and osteoporosis	Candidate proteomics can serve as biomarkers for osteoporosis and osteopenia
Huang 2020		3 proteins Lysozyme C, Glucosidase, and Protein disulfide isomerase A5 were significantly correlated to low BMD	
Pepe 2022		Analysis of the miRNome noted miR-1246 and miR-1224-5p were up and down-regulated respectively in the osteoporotic group Apolipoprotein was upregulated in both osteopenia and osteoporosis when compared to controls	

P-68.

Bleeding patterns with use of an oral contraceptive containing estetrol and drospirenone in older participants from two phase-3 clinical trials.

Andrew M. Kaunitz, MD[2], Melissa J. Chen, MD, MPH[1], Nina Flerin[3], Ricardo Maamari, MD[5], Jean-Michel Foidart, MD, PhD[3,4], Mitchell D. Creinin, MD[1]. [1]Obstetrics and Gynecology, UC Davis, Sacramento, CA; [2]Obstetrics and Gynecology, University of Florida Jacksonville, Jacksonville, FL; [3]Mithra Pharmaceuticals, Liege, Belgium; [4]Obstetrics and Gynecology, University of Liege, Liege, Belgium; [5]Mayne Pharma, Raleigh, NC

Objective: Estetrol 15 mg/drospirenone 3 mg is the only combined oral contraceptive containing estetrol, a native estrogen with tissue-selective agonist/antagonist action. Estetrol and drospirenone have long half-lives (28 and 30 hours, respectively), which promotes optimal bleeding outcomes with daily use. Estetrol is also in clinical development for treatment of postmenopausal vasomotor symptoms. Combined oral contraceptives are commonly used by older reproductive-age women for pregnancy prevention and cycle control. To provide more detailed bleeding outcomes for individuals in this age group, we compared bleeding data from participants 40-50 years old and 16-39 years old from two international phase 3 estetrol/drospirenone trials. **Design:** We evaluated bleeding data from two parallel phase 3 trials performed to assess the contraceptive efficacy and safety of estetrol/drospirenone in a 24/4-day regimen for up to 13 cycles. The trials, conducted in Europe and Russia and the United States and Canada, enrolled healthy participants 16–50 years old with regular menstrual cycles and a body mass index (BMI) of 18-35 kg/m^2. Participants reported vaginal bleeding (flow requiring sanitary protection use) or spotting (minimal flow, no sanitary protection use) on daily paper diaries. For this analysis, we included participants who started treatment and had ≥1 evaluable 28-day cycle. We compared bleeding outcomes (scheduled bleeding, unscheduled bleeding. unscheduled spotting only, no bleeding/spotting) on evaluable cycles through 12 cycles and bleeding-related treatment emergent adverse events (TEAEs) between participants 40-50 years old and 16-39 years old. We performed t-tests and Fisher exact tests, as appropriate, for statistical analyses. **Results:** Of 3417 participants who started treatment, 3409 (99.8%) had ≥1 evaluable cycle with 221 (6.5%) aged 40-50 years. BMIs in the older and younger groups were 25.3±4.1 kg/m^2 and 24.5±4.5 kg/m^2, respectively ($p=0.02$). We found no global or consistent differences in any bleeding outcomes (see Table). Across 12 cycles, scheduled bleeding/spotting incidence per cycle ranged from 87.0-96.2% in participants aged 40–50 years and 91.5-94.3% for those 16-39 years. Bleeding-related TEAEs in the 40-50 years and 16-39 years age groups did not differ including metrorrhagia (5.4% and 5.0%, respectively, $p=0.75$), vaginal hemorrhage (3.6% vs 3.4%, respectively, $p=0.85$), and menorrhagia (2.2% vs 1.5%, respectively, $p=0.40$). Discontinuation for bleeding complaints occurred in 6 (2.7%) and 94 (2.9%), respectively, $p=1.00$. **Conclusion:** We found no overall differences in scheduled and unscheduled bleeding/spotting or bleeding-related TEAEs

across 12 cycles of estetrol/drospirenone use in participants 40-50 years compared to 16-39 years. These results demonstrate positive bleeding outcomes with estetrol/drospirenone use in older combined oral contraceptive users.

Sources of Funding: Estetra SRL, an affiliate company of Mithra Pharmaceuticals.

Bleeding outcomes

Cycle	Scheduled bleeding			Unscheduled bleeding			Unscheduled spotting only			No bleeding/spotting		
	40-50 years n=221	16-39 years n=3188	p-value*	40-50 years n=221	16-39 years n=3188	p-value*	40-50 years n=221	16-39 years n=3188	p-value*	40-50 years n=221	16-39 years n=3188	p-value*
1	96.2%	94.3%	0.28	5.2%	8.6%	0.09	23.0%	27.1%	0.20	7.0%	5.9%	0.46
2	95.1%	93.4%	0.38	3.9%	8.1%	0.03	14.6%	20.6%	0.05	8.3%	7.7%	0.79
3	89.5%	91.8%	0.24	3.5%	8.5%	0.01	17.5%	20.4%	0.36	11.0%	7.7%	0.10
4	92.2%	91.7%	0.89	4.7%	8.1%	0.10	15.0%	19.3%	0.15	6.7%	7.1%	1.00
5	91.4%	92.6%	0.56	6.5%	7.4%	0.77	15.1%	17.7%	0.42	8.3%	6.3%	0.29
6	87.0%	92.1%	0.02	5.4%	7.5%	0.38	17.9%	16.7%	0.68	10.9%	7.9%	0.16
7	87.1%	92.6%	0.01	4.5%	7.3%	0.28	14.6%	15.5%	0.83	9.6%	6.9%	0.18
8	92.5%	90.8%	0.58	4.6%	6.8%	0.34	12.1%	15.4%	0.27	8.7%	7.4%	0.55
9	90.0%	91.5%	0.40	3.4%	7.5%	0.05	14.4%	15.8%	0.46	9.8%	7.3%	0.23
10	91.1%	92.7%	0.44	3.0%	6.6%	0.07	13.6%	15.0%	0.74	7.7%	6.4%	0.51
11	90.4%	92.7%	0.28	3.0%	5.4%	0.21	9.6%	14.2%	0.10	9.0%	6.1%	0.14
12	87.3%	93.0%	0.01	3.6%	6.2%	0.23	11.5%	15.1%	0.25	10.9%	6.6%	0.05

***Fisher exact testing.**

P-69.

Effects of the Vaginal Suppository Revaree® Plus on Women Who Experience Moderate-to-Severe Vaginal Dryness

Susan Kellogg-Spadt, PhD[1,2], Tatiana Silva[3], Michael Krychman, MD[4,5], Suzanne Weber, MD[6], Alyssa Dweck, MD[3], Trisha A. VanDusseldorp, PhD[3], James Komorowski[3]. [1]Center for Pelvic Medicine, Bryn Mawr, PA; [2]Drexel University College of Medicine, Philadelphia, PA; [3]Bonafide Health, Harrison, NY; [4]Southern California Center for Sexual Health and Survivorship Medicine, Laguna Beach, CA; [5]Clinical Health Professor, University of California Irvine, Irvine, CA; [6]AdventHealth Medical Group OB/Gyn at Littleton, Littleton, CO

Objective: The primary objective was to evaluate the effects of the nonhormonal moisturizing agent Revaree Plus, containing hyaluronic acid (HA) and sweet almond oil, on vaginal symptoms in women who experience moderate-to-severe vaginal dryness. **Design:** In an open-label study, women aged 41-79 with self-reported moderate-to-severe vaginal dryness inserted a Revaree Plus vaginal suppository, which contains 10 mg of HA and sweet almond oil, twice a week for four weeks. This new formulation, which contains double the amount of HA as in Revaree 5 mg, was evaluated for its impact on vaginal symptoms including dryness (internal and vulvar), itching, burning or stinging, irritation, and painful sex. Primary outcome: change in vaginal dryness via weekly diaries. Secondary outcomes: validated monthly questionnaires (Vaginal Symptom Questionnaire [VSQ] and Day-to-Day Impact of Vaginal Aging [DIVA]) at Baseline and Week 4. Data was analyzed using Group x Time Repeated Measures ANOVA (alpha < 0.05). **Results:** Seventy women (57.3 ± 7.5 years) completed four weeks of treatment. Sixty-three women were postmenopausal, five were perimenopausal, and two were premenopausal. After one week, over half of the women showed an improvement in vaginal dryness (n=65), burning or stinging (n=28), and irritation (n=32) by at least one category (e.g., from severe to moderate or moderate to absent). Moreover, 43% of women experienced a decrease in painful sex after one week of usage (n=44). After four weeks, approximately 80% of women showed an improvement in vaginal dryness by at least one category (n=70). There were no serious adverse events reported. Consumer experience data provides support for Revaree Plus as a comfortable, easy to use, and efficacious treatment for vaginal dryness. 90% of women were satisfied with Revaree Plus (n=69). Over 90% of women agreed that the product reduced their vaginal dryness and improved their daily comfort (n=69). Additionally, 93% of women would recommend Revaree Plus (n=69), and 95% of women preferred it to other products on the market for vaginal dryness (n=56). The full results are detailed in Tables 1 and 2. **Conclusion:** The four-week usage of Revaree Plus, a nonhormonal moisturizing agent with HA and sweet almond oil, resulted in a significant improvement in vaginal dryness. Improvement was seen across other bothersome vaginal symptoms including vulvar dryness, itching, burning or stinging, and irritation. Additionally, Revaree Plus was shown to significantly alleviate vaginal pain and dryness during sexual intercourse. There was a positive effect of the vaginal suppository on quality-of-life metrics such as activities of daily living, emotional well-being, sexual functioning, and body image. Lastly, 90% of women were satisfied with Revaree Plus and would recommend the product to others. These findings provide support for the use of Revaree Plus to reduce vaginal dryness in women.

Sources of Funding: Bonafide Health, LLC

Vaginal Symptom Questionnaire (VSQ)	Symptoms (n=70)	Emotions (n=70)	Life-Impact (n=70)	Sexual Impact (n=44)
Baseline	2.3 ± 1.7	1.6 ± 1.3	2.1 ± 1.6	2.6 ± 1.1
Week 4	1.5 ± 1.3	0.8 ± 1.2	1.3 ± 1.5	1.6 ± 1.5
Percent Change	-34.8	-48.1	-38.1	-38.5
Significance from Baseline	p < 0.01	p < 0.001	p < 0.001	p < 0.001
Day-to-Day Impact of Vaginal Aging (DIVA)	Activities of Daily Living (n=70)	Emotional Well-Being (n=70)	Sexual Functioning (n=70)	Self-Concept and Body Image (n=70)
Baseline	2.5 ± 3.6	5.5 ± 3.6	17.0 ± 7.5	13.8 ± 5.2
Week 4	1.4 ± 1.8	3.6 ± 3.2	11.5 ± 7.5	10.8 ± 6.5
Percent Change	-42.6	-35.2	-32.3	-21.5
Significance from Baseline	p < 0.05	p < 0.001	p < 0.001	p < 0.001

Responder Analysis - Weekly Diary Data	Dryness (Internal) (n=70)	Dryness (Vulvar) (n=66)	Itching (n=32)	Burning or stinging (n=29)	Irritation (n=34)	Pain during sex (n=41)	Dryness during sex (n=42)
% Improved	79%	65%	75%	76%	76%	78%	86%
Significance from Baseline	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001	p < 0.001

P-70.

Association of hysterectomy with depression in US postmenopausal women: a national population-based study

Sunyoung Kim, MD[2], Ji Yeon Han, MD[1,2], Sung Woo Kim, MD[1,2], Seung-Yup Ku, MD, PhD[1,2], Hoon Kim, MD, PhD[1,2]. [1]Dept. of Obstetrics & Gynecology, Seoul Nat' Univ. College of Medicine, Seoul, Korea (the Republic of); [2]Dept. of Obstetrics & Gynecology, Seoul Nat'l Univ. Hospital, Seoul, Korea (the Republic of)

Objective: Hysterectomy is a widely performed gynecological practice in middle-aged women. Although hysterectomy can treat underlying gynecological diseases effectively, there has been a concern for depression in hysterectomized women. We aimed to evaluate the association between hysterectomy and depression. **Design:** This cross-sectional study is based on the National Health and Nutrition Examination Survey (NHANES) in the United States. We analyzed the national representative data in the United States aged 19-79 years from the NHANES from 2007 to 2018. The information about total hysterectomy (TH) or bilateral salpingo-oophorectomy (BSO) was retrieved using the NHANES Questionnaire. The Patient Health Questionnaire-9 (PHQ-9) is a nine-item questionnaire designed to screen for depression, which was defined using the standard cut-off score (10 or above). The association between hysterectomy and depression was analyzed, adjusting for potential confounders using a complex survey analysis. **Results:** A total of 7,258 women reported menopause naturally or surgically, representing an estimated population of 46,792,277 women, accounting for the complex sampling and weighting methods used. Compared to postmenopausal women who had not undergone TH or BSO, women who had undergone BSO and TH after menopause had 2.88 times higher odds for depression (95% confidence interval (CI) 1.81-4.59) after controlling for age, body mass index, ethnicity, education level, family income, marital status, parity, high-risk alcohol intake, smoking status, physical activity, and menopausal hormone therapy (MHT). Also, women who had undergone TH with BSO or BSO alone at menopause (known as surgical menopause) were more likely to have depression (Odds ratio (OR) 2.05, 95% CI 1.48-2.84). The results did not change significantly when the analysis was restricted to MHT-naïve women. **Conclusion:** Postmenopausal hysterectomized women were more likely to have depression, regardless of when they had their hysterectomy. Clinicians should be aware of the risk of depression in postmenopausal hysterectomized women.

Sources of Funding: This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korean government (MSIT) (No. 2023R1A2C1005003).

P-71.

Association of postmenopausal hormone therapy with geriatric nutritional risk index in US women: a national population-based study

Sunyoung Kim, MD[2], Ji Yeon Han, MD[1,2], Sung Woo Kim, MD[1,2], Seung-Yup Ku, MD, PhD[1,2], Hoon Kim, MD, PhD[1,2]. [1]Dept. of Obstetrics & Gynecology, Seoul Nat' Univ. College of Medicine, Seoul, Korea (the Republic of); [2]Dept. of Obstetrics & Gynecology, Seoul Nat'l Univ. Hospital, Seoul, Korea (the Republic of)

Objective: The geriatric nutritional risk index (GNRI) is often used as a nutritional surrogate. However, few studies have directly investigated GNRI by postmenopausal hormone therapy (MHT). We aimed to explore the association of GNRI with MHT. **Design:** This cross-sectional study is based on the National Health and Nutrition Examination Survey (NHANES) in the United States. We analyzed the national representative data on women with natural menopause in the United States aged 19-79 years from the NHANES from 2007 to 2018. The information about postmenopausal hormone therapy was retrieved using the NHANES Questionnaire on the use of prescription medications during a one-month period prior to the participant's interview date. GNRI was defined as follows: GNRI=14.89 × serum albumin (g/dL) + 41.7 × (actual body weight/ideal body weight), and ideal body weight was calculated as follows: ideal body weight (kg)=(height (m))^2 × 22 (kg/m^2). The GNRI by MHT use was analyzed, adjusting for potential confounders using a complex survey analysis. **Results:** A total of 1,499 women reported natural menopause, representing an estimated population of 10,024,634 postmenopausal women accounting for the complex sampling and weighting methods used. Current MHT users were more likely to be younger, non-Hispanic white, more educated, and married than ever users or never users. Current MHT users tended to have lower GNRI compared to never-MHT users (117.4 vs. 119.0, P=0.37); however, the difference did not reach statistical significance. This association did not change after controlling for age, ethnicity, education level, family income, high-risk alcohol intake, smoking status, physical activity, hypertension, and diabetes mellitus. **Conclusion:** There was no significant difference in GNRI by MHT in this nationally representative study of postmenopausal women. The association was not different after adjustment for potential confounders.

Sources of Funding: This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korean government (MSIT) (No. 2023R1A2C1005003).

P-72.

Equol prevents the development of bladder dysfunction in ovariectomized rats

Ryo KITAOKA[1], Nozomu Miyazaki[2], Chiaki Ozaki[2], SHIGETO UCHIYAMA, Fellow[1], Tomoko Higuchi[1], Nami Ito[1], Tatsuo Suzutani[2]. [1]Saga Nutraceuticals Research Institute, Otsuka Pharmacheutical Co., Ltd., Kanzaki-gun, Japan; [2]Department of Microbiology, Fukushima Medical University, Fukushima, Japan

Objective: The number of patients with overactive bladder (OAB) increases in postmenopausal women. Although it is known that menopause (estrogen deficiency) is associated with frequent urination, the mechanism of pathogenesis is not yet understood. Treatment includes anticholinergics, β3 adrenergic receptor agonists, and botox injections, but hormone replacement therapy is currently not recommended for active use in clinical practice due to the risk of side effects (cancer, stroke) in Japan. Equol (EQL), a metabolite of soy isoflavone, is produced by intestinal bacteria. Approximately 20-30% of Westerns and ~50% of Asians can produce EQL in their body. EQL has been reported to have physiological effects such as antioxidant and neuroprotective effects in addition to hormone-like effects such as estrogen-like, antiestrogenic and antiandrogenic effects. To date, clinical findings confirmed its efficacy in menopausal symptoms, bone metabolism, metabolic syndrome and skin aging in postmenopausal women consuming 10 mg EQL containing supplement. We focused on its the estrogen-like and neuroprotective effects. To determine whether EQL prevents the development of bladder dysfunction, animal study was conducted using ovariectomized (OVX) rats to mimic lower urinary tract symptoms related to urination and urine retention observed in perimenopausal women. **Design:** Sixteen-week-old female Sprague-Dawley rats were used, and bilateral ovaries were removed under isoflurane inhalation anesthesia and kept for 4 months. The sham-operated group, in which the ovaries were not removed, was designated the Sham group. The control diet was AIN-76, and EQL (0.25 g/kg, approximately 5 mg/day dose) was added to the control diet (EQL diet). The experimental groups were divided into three groups: the Sham group (control diet), the OVX group (control diet), and the OVX-EQL group (EQL diet), with 10 animals in each group. 4 months after OVX, the animals were tested by measuring bladder pressure under awake conditions, oxidative stress markers, and immuno-histochemical staining of the bladder with neural markers (Neurofilament-H: N, Peripherin: P). **Results:** EQL suppressed OVX-induced weight gain and reduced bladder weight loss. EQL concentrations of blood and urine were found only in the OVX-EQL group (serum: 2.67 μM, urine: 5.17 μmol/24h urine). Bladder pressure measurements showed significantly longer voiding intervals and increased voiding volume in the OVX-EQL (499 sec, 0.82 ml) compared to OVX (303 sec, 0.42 ml). Bladder compliance was significantly decreased in OVX (0.05 ml/cm H2O) compared to Sham (0.16 ml/cm H2O), and OVX-EQL (0.11 ml/cm H2O). The area of nerve fibers in the bladder was decreased in OVX (N: 0.31%, P: 0.36%) compared to Sham (N: 0.47%, P: 0.49%), and the decrease was reduced in OVX-EQL (N: 0.39%, P: 0.45%). Malondialdehyde, an oxidative stress marker, showed a significant increase in urinary concentration in OVX (0.75 μmol/mg creatinine) compared to Sham (0.41 μmol/mg creatinine) and a reduced increase in OVX-EQL (0.60 μmol/mg creatinine). **Conclusion:** These results suggest that EQL prevents the development of bladder dysfunction in OVX rats. The mechanism may involve the antioxidant and neuroprotective effects of EQL. This is the first report showing a potential of equol for attenuating OAB in postmenopausal women.

Sources of Funding: None

P-73.

Menopause Hormone Therapy (MHT) among Women Aged 40-65 years: Age-Based Perceptions

Benjamin Klein, Jingting Zhang, PhD, Michael Phelan, PhD, Jill Liss, MD, Russell A. Gould, PhD. Self Care, Johnson & Johnson Services Inc, New Brunswick, NJ

Objective: Previous research conducted by the Women's Health Initiative has demonstrated a connection between MHT and an increased risk of coronary heart disease and breast cancer. Consequently, MHT use and new prescriptions significantly decreased. Subsequently, ongoing analysis of WHI data and new studies support that benefits of MHT outweigh the risks for younger patients or those in early stages of the menopausal transition (Cagnacci and Venier, 2019). With the topic of MHT remaining controversial and polarizing among patients, the current study aims to provide more insights on women's perceptions and experiences with MHT, and to explore potential age-related variations. **Design:** The Attitudes and Usage (A&U) study was conducted among 4,578 female participants aged 40-65 years (Mean = 50.2, SD = 7.6) in the United States. Participants completed the online survey over a three-week period, with an average completion time of 25 minutes per participant. To ensure validity of responses, participants were excluded if anyone in their close network works in the healthcare ecosystem. In total, the A&U study enrolled Caucasian (n = 2,936), African American (n = 665), Asian (n = 147), Native American (n = 41), Hispanic (n = 665) women and other ethnicities (n = 124). The study included 118 questions on health attitudes, treatment history, knowledge of MHT, and proposed solutions. The current study evaluated differences in women's self reported knowledge and attitudes towards MHT by age group. To identify the role of MHT knowledge on women's attitudes toward MHT, we conducted Spearman correlations for paired symptoms at the individual level within each ethnic group. To examine the age variations, women were categorized into 4 age groups: 40-45 years, 45-50 years, 50-60 years, and 60-65 years. Kruskal-Wallis tests were utilized to compare differences in attitudes towards MHT across age groups. We then conducted post hoc Dunn's tests (FDR corrected) for pairwise comparisons to examine specific age group distinctions in each attitude towards MHT. **Results:** Correlation results showed a significant association between greater knowledge of MHT and emotional responses towards MHT ($ps < 0.001$). Higher levels of MHT knowledge were related to more positive feelings and fewer negative feelings. Better MHT knowledge being significantly associated with more positive attitudes towards MHT was reflected by survey responses including feelings of optimism regarding the helpfulness of MHT and relief at starting MHT ($rs = 0.2 \sim 0.25$, $ps < 0.001$). Simultaneously, increased knowledge of MHT was significantly correlated with reduced negative attitudes, as evidenced by survey responses reflecting feelings of inadequacy in managing menopause independently, uncertainty regarding MHT, and reluctance to discuss MHT with family and friends ($rs = -0.2 \sim -0.24$, $ps < 0.001$). Regarding the age-related variations, the Kruskal-Wallis test results showed significant differences among groups in certain attitudes, with older adults 55 to 65 having stronger positive attitudes towards MHT compared to younger adults 40 to 50 ($Hs = 15.7 \sim 256.0$, $ps < 0.01 \sim 0.001$). Among the top three survey attitude responses exhibiting substantial age-related variances, post hoc Dunn's pairwise analyses identified significant age differences across all four age groups, with the exception of the following two pairs: 40-45 years vs. 45-50 years, and 55-60 years vs. 60-65 years. These attitudes included feelings of inadequacy in managing menopause independently, reluctance to discuss MHT with family and friends, and uncertainty regarding MHT. Older women are also more willing to consider MHT and feel a sense of responsibility to share about MHT with more women. **Conclusion:** The current study indicates that older women 55 to 65 have a greater understanding of MHT, exhibit more positive attitudes towards MHT, and are more receptive to utilizing MHT compared to younger women 40 to 50. These findings underscore a key opportunity to educate the next generation of women who are undergoing the menopause transition. Our findings offer valuable insights for clinicians, enabling them to better comprehend the potential perceptions of MHT among patients across various age groups, and facilitating proactive discussions about MHT.

Sources of Funding: Kenvue

P-74.

Understanding Variations in Menopause Symptom Co-occurrences Across Ethnicity and Income Levels

Benjamin Klein, Jingting Zhang, PhD, Michael Phelan, PhD, Russell A. Gould, PhD, Jill Liss, MD. Self Care, Kenvue, Fort Washington, PA

Objective: Previous research has reported that women experiencing menopause-related symptoms such as hot flashes tend to experience additional symptoms such as depression (Thurston et al., 2006). However, little is known about demographic variations in menopausal symptom co-occurrences. Here we studied how menopause symptoms vary across demographic groups, particularly ethnicity and income levels, focusing on a range of symptoms including vasomotor, sleep, and cognitive symptoms along with mental and sexual health. **Design:** The Attitudes and Usage (A&U) study was conducted among 4,578 female participants aged 40-65 years (Mean = 50.2, SD = 7.6) in the United States. Participants completed the online survey over a three-week period, with a mean completion time of 25 minutes per person. To ensure validity of responses, participants were excluded if anyone in their close network works in the healthcare ecosystem. In total, the A&U study enrolled Caucasian (n = 2,936), African American (n = 665), Asian (n = 147), Native American (n = 41), Hispanic (n = 665) women and other ethnicities (n = 124). The study included 118 questions on health attitudes, treatment history, knowledge of HRT, and proposed solutions. Here we focus on women's symptom experiences. To identify symptom co-occurrences, we conducted Phi correlations for paired symptoms at the individual level for each ethnic group. One-way ANOVA was used to evaluate the ethnic group variations in the number of co-occurring symptoms with group means adjusted by sample sizes. The role of income in symptom co-occurrences was assessed by recording significant pairs for each income group and conducting chi-square tests across income levels. **Results:** Correlations across the symptom occurrences showed that women experience multiple symptoms simultaneously: $rs = 0.3 \sim 0.6$, $ps < 0.05 \sim 0.005$. One-way ANOVA revealed a significant effect of ethnicity on the number of significant co-occurring symptoms ($F = 13.0$, $p < 0.001$). Pairwise comparisons showed that the Native American group reported significantly more co-occurring symptoms than all other ethnic groups: $ps < 0.05$. Different ethnic groups of women experience common and unique menopausal symptoms. For instance, hot flashes were accompanied by night sweats and mood swings across all ethnicities. In addition, African American women experienced insomnia, Caucasians had irritability, loss of libido, insomnia, and cognitive issues, Asian women showed vaginal dryness, Hispanics noted changes in body odor, and Native Americans had up to 25 symptoms including headaches. The chi-square test revealed a significant effect of income in the number of co-occurring symptoms: $X2(3,4) = 59.2$, $p < 0.001$. Tukey's HSD pairwise analyses showed a significant sequential decrease in co-occurring symptoms with increasing income levels: under $35k, $35k - $75k, $75k - $150k, and above $150k ($ps < 0.05 \sim 0.001$). **Conclusion:** Our findings align with the SWAN study findings that women experience various symptoms related to menopause (Khoudary et al., 2019). We have also found that ethnicity significantly influences symptom experiences, informing clinical practices. Our findings can aid in menopause diagnosis through symptom screening and guide healthcare providers in tailored questioning. Additionally, our research suggests the importance of utilizing genetic testing to better understand ethnic patterns and genetic variability, as well as facilitating targeted treatments for diverse groups of women.

Sources of Funding: Kenvue

Table 1. Number of Co-occurring symptoms by Ethnicity.

Symptom	African American	Asian	Caucasian	Hispanic	Native American
Hot flashes	3	4	9	3	25
Night sweats	6	1	7	6	18
Changes in body odor	5	1	2	6	30
Headaches	3	11	16	13	17
Migraine	2	12	5	1	37
Loss of Libido	8	7	12	5	28
Loss of Mental Sharpness	21	12	22	25	35
Memory issues	16	14	24	20	22
Irregular Heartbeat	1	8	0	1	20
Weight gain	2	11	9	9	21
Fatigue	18	19	22	28	31
Insomnia	17	20	14	13	35
Depression	16	14	22	13	25
Anxiety	12	19	20	15	30

P-75.

Associations of Social Determinants of Health on Likelihood of Systemic Hormone Therapy Use in Midlife Women

Juliana M. Kling, MD, MPH, NCMP, FACP[1], Ekta Kapoor[2], Kristin Cole[2], Mariam Saadedine[3], Chrisandra Shufelt[3], Stacy Winham[2], Stephanie Faubion[3]. [1]Womens Health Internal Medicine, Mayo Clinic, Scottsdale, AZ; [2]Mayo Clinic, Rochester, MN; [3]Mayo Clinic, Jacksonville, FL

Objective: Social determinants of health (SDOH) can have a significant impact on women's health and quality of life. Little is known about the impact of SDOH during menopause, and whether certain SDOH's impact likelihood of being on systemic hormone therapy (HT). Our objective was to evaluate the impact of various SDOH on the likelihood of being on HT in midlife women. **Design:** A cross sectional survey as part of the Mayo Clinic Registry of Midlife Women (Hormones and ExpeRiences of Aging, HERA) was completed between March and June of 2021. The questionnaire included information on medications used to treat menopause symptoms. From the electronic medical record we pulled demographic information (age, BMI, race, education) and self-reported answers to questions about amount of exercise/physical activity, if they feel stress, social interactions (attendance to clubs or organizations, talk on the telephone with friends/relatives), abuse in the last year, ability to pay for basics, diet (fruits and vegetables per day), alcohol intake, smoking status, and attendance to a dentist. SDOHs were compared between those with/without HT using a t-test for continuous data, Wilcoxon rank sum test for variables on a Likert scale, and Chi-square tests for categorical data. **Results:** One thousand nine hundred and eighty-eight women aged 45 – 60 years who received primary care at Mayo Clinic (Rochester, MN; Scottsdale, AZ; Jacksonville, FL; and Mayo Clinic Health System, NW WI) completed the HERA survey and filled out SDOH within 2 years of taking the survey. Women were 54.4 of age on average (SD 4.2), with a mean BMI of 30.2 (SD 7.5), and a majority white (97.1%). In univariate analysis, women with HT had a lower BMI (Mean BMI: HT 28.8 vs no HT 30.4, p=0.002), more likely to be partnered (HT 87.9% vs no HT 82.9%, p=0.04), had higher education (HT 32.9% vs no HT 25.7% post grad studies, p=0.03), less food insecurity (HT 2.0% vs no HT 4.8%, p=0.045), used extra virgin olive oil as main fat in diet more often (HT 70.2% vs no HT 61.7%, p=0.009), and were more likely to have never smoked (HT 74% vs no HT 64.9%, p=0.006). No other SDOHs were associated with HT. **Conclusion:** In this large study of predominantly White women with access to care, various SDOHs were associated with HT for menopause treatment. To assure equitable menopause treatment for all women, clinicians should evaluate and address SDOHs with their midlife women. Follow up studies in diverse populations can provide further insight into these relationships.

Sources of Funding: Dr Kapoor receives funding from the NIH/National Institute on Aging Grant U54 AG044170.

P-76.

Pituitary Ovarian Hormones before years after different menopausal hormone therapy formulations in the KEEPS continuation study

Juliana M. Kling, MD, MPH, NCMP, FACP[3], Nirubol Tosakulwong[2], Timothy Lesnick[2], Angela Fought[2], Firat Kara[2], Carey Gleason[1], Kejal Kantarci[2]. [1]University of Wisconsin Madison, Madison, WI; [2]Mayo Clinic, Rochester, MN; [3]Mayo Clinic, Scottsdale, AZ

Objective: Pituitary-ovarian hormones change across the menopausal transition and may have various physiological consequences. However, little is known about how the major types of post-menopausal hormone therapy (HT) affect pituitary-ovarian hormonal relationships during and years after use. The objective of this study was to evaluate pituitary- ovarian hormones changes in midlife women approximately 8 years post treatment with common HT formulations vs placebo. **Design:** Kronos Early Estrogen Prevention Study (KEEPS) continuation is a randomized, placebo-controlled, double-blind multicenter clinical trial that evaluated cardiovascular and cognitive effects of o-CEE, transdermal 17β-estradiol, and placebo in healthy women who experienced natural menopause between 42 and 58 years of age. Initial enrollment occurred at 9 US sites between August 2005 and July 2008, with final visits completed in 2012. Participants were randomized to receive 4 years of double-blind treatment with 50 μg/d t-E2 twice weekly, 0.45 mg/d o-CEE daily both with oral 200 mg/d micronized progesterone for the first 12 d/mo for endometrial protection, or placebo pills and patches. The continuation study recontacted patients between 2017 and 2022 and enrolled 299 of the 727 KEEPs participants approximately 8 years post treatment. Hormone levels including androstenedione (ng/dL), testosterone (ng/dL), estradiol (E2 pg/mL), estrone (E1 pg/mL), FSH (IU/L), and LH (IU/L), were measured at the clinical core laboratory at Mayo Clinic, Rochester, MN. **Results:** One hundred and ninety six women had hormone levels at baseline at KEEPS continuation. Twenty-three were removed at continuation as they were on systemic HT. Women were average age of 67 (SD=2) at KEEPS continuation with a BMI of 27.5 kg/m^2 (SD=5.3). Hormone values based on treatment arm are displayed in Figure 1. Mean levels of FSH, LH, E1 and E2 were lower at KEEPS continuation than at KEEPS baseline, which did not differ by treatment groups. **Conclusion:** Pituitary ovarian hormone levels were not impacted by common HT formulations years after discontinuation of those treatments. The sex steroid hormone levels were similar regardless of if women had taken HT.

Sources of Funding: NIH RF1 AG057542 and Intramural support from the Mayo Clinic Women's Health Center was used to support this project.

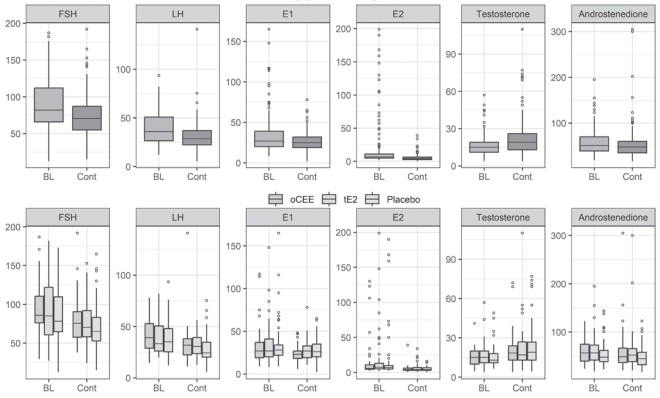


Figure 1. Boxplots of hormone values at baseline, and continuation

P-77.

Application of a Deep Neural Network-Based Algorithm to Provide Additional Information in the Assessment of Adnexal Masses Classified as Indeterminate by Imaging

Christina M. Kronfel, Manjusha R. Choudhury, Leo B. Twiggs, Victoria Haverbusch, Silvana Franco, Allison Jarosz, Todd C. Pappas. Aspira Women's Health, Austin, TX

Objective: Evaluate the application of a validated deep neural network-based algorithm (MIA3G) in pre and postmenopausal women to assess ovarian cancer risk of adnexal masses classified as indeterminate based on imaging. **Design:** Data were collected from 2 IRB approved clinical studies (NCT04668521 and NCT04487405) spanning 12 sites. Patients were enrolled with a previously identified adnexal mass or one discovered on exam prior to enrollment. Physicians used standard practice to evaluate the mass and, where imaging was used, were asked to provide an assessment of that mass based on imaging as benign, malignant, or indeterminate. Complete medical history and post-surgery pathology reports were collected. Serum protein biomarkers were run in a CLIA-CAP certified lab and processed through a validated deep neural network-based algorithm (MIA3G) to assess ovarian cancer risk. Physicians did not have access to the MIA3G score. **Results:** Physicians provided clinical assessment of adnexal masses in 637 cases, with 38.5% (245/637) assessed as "imaging indeterminate," 58.9% (375/637) as "imaging benign" and 2.7% (17/637) as "imaging malignant." Of the patients with imaging assessment, 183 went to surgery and have pathology results. The remaining 454 were classified as "clinically benign" based on the duration they were monitored without surgery (Suh-Burgmann & Kinney, 2016, doi:10.3389/fonc.2016.00025). MIA3G was run for patients with physician assessment of the mass and returned a "MIA3G-low malignant potential" (LP) score for 89.3% (569/637) of all patients and an "MIA3G-indeterminate" (IND) for 10.7% (68/637). In patients with masses classified by physician as "imaging indeterminate," 87.3% (214/245) had a MIA3G-LP score, which could have provided additional information in the final patient care outcome. Of the 65 patients who went to surgery, 50 had an LP score from MIA3G. Use of MIA3G could have reduced surgical referral by 76.9% if malignancy risk and MIA3G were considered in this cohort. When stratified by menopausal status, 34.6% (35/101) of postmenopausal patients with masses classified by a physician as "imaging indeterminate" went to surgery. This would have been 9.9% (10/101) if MIA3G-IND was considered, or a 71.4% reduction in surgery referral. For premenopausal patients, 20.8% (30/144) classified by physician as "imaging indeterminate" physician and went to surgery, but if MIA3G-IND was considered, it would have been 3.5% (5/144), or an 83.3% reduction. **Conclusion:** Our data indicate that MIA3G could result in the reduction of ovarian surgical referrals, with a potential consequential reduction in ovary removal, where malignancy risk may be a critical consideration for surgery. MIA3G would have resulted in a larger reduction of surgical referral in premenopausal women which is consistent with a higher malignancy risk following menopause.

Sources of Funding: Aspira Women's Health

P-78.

Sensate Lubricant Ingredient Provider Perception & Education RegistrY (SLIPPERY) Survey: The Menopause Health Care Professionals Experience

Michael Krychman. So Cal Center for Sexual Health, Newport Beach, CA

Objective: Health care professionals (HCPs) primarily recommend the use of personal lubricants as the mainstay, non-hormonal treatment of Genitourinary Syndrome of Menopause (GSM) and symptomatic vaginal dryness, and for painful sexual intercourse also known as dyspareunia. In addition, it is estimated that up to 50% of men and women may add a lubricant into their sexual repertoire to enhance intimate pleasure and improve sexual satisfaction (1). Sensate lubricants can be used for effective management of vaginal dryness. They also contain additional ingredients that may evoke tingling, warming, or cooling sensations, which can impact arousal and orgasmic responsivity. There is limited information in the scientific literature regarding HCP awareness of sensate lubricant ingredients, and their clinical recommendation pattern. We conducted an ad-hoc survey of HCPs specializing in menopause, to better understand their perceptions concerning lubricant ingredients, their clinical recommendation patterns, and barriers to recommendation or use of sensate lubricants in clinical practice. **Design:** A random convenience sample of participants who attended the 2023 Menopause Society Annual Conference in Philadelphia, Pennsylvania were asked to complete an anonymous online survey at a lubricant manufacturer's exhibit booth which simultaneously collected all responses. The survey consisted of 12 questions, designed to assess perception of ingredients, frequency and barriers to sensate lubricant recommendations and HCP demographics. Participation was voluntary and those who completed the survey were not compensated. **Results:** A total of 88 participants completed the survey. The majority (77%) were self-defined as female. Fifty-six (56%) were Obstetrician Gynecologists whereas, 20% were nurse practitioners or physician assistants. Forty-five (45%) of participants were between 45-64 years of age. The sample was geographically diverse (50% Northeast, 20% Midwest, 21% South, 9% West). Clinical practices included 17% in private practice, 41% in a single specialty group, and 20% in multi-specialty groups. The most common ingredients that participants were aware of included: synthetic fragrances/flavors (82%), glycerin (80%), natural fragrances/flavors (71%), alcohols including propylene glycol and propanediol (70%), parabens (69%) and carbomer (27%). The most important ingredients detrimental to the recommendation of sensate lubricants included alcohols (92%), synthetic flavors and fragrances (82%) and parabens (67%). Fifty-nine percent (59%) of those surveyed never or rarely recommend sensate lubricants. The biggest barriers to utilization included concerns about adverse events (62%), efficacy (20%) and lack of clinical data (20%). Cost of the product was not a significant deterrent or concern (6%). Fifty-eight percent (58%) of those who completed the survey would be likely, or extremely likely, to recommend over-the-counter sensate lubricants if there were clinical data available demonstrating positive outcomes in a large study population. Most survey respondents (75%) recommend vaginal moisturizers for DAILY vaginal dryness, whereas 58% suggest silicone or water-based lubricants. Interestingly, there remains an educational gap of awareness that vaginal moisturizers maintain hydration and improve epithelial elasticity and pliability, when used on a regular basis; whereas lubricants improve lubricity and decrease friction during coitus. This gap can be best served by improved educational interventions. **Conclusion:** Most HCPs specializing in menopause currently shy away from suggesting sensate lubricants for their menopausal patients, due to ingredient concerns and lack of large population clinical data. Most would alter their current treatment paradigm and suggest sensate lubricants if there were positive clinical data demonstrating additional safety and performance. There remains a paucity of clinical research, and a gap in published literature that pertains to sensate lubricants. These products have the potential to improve sexual arousal and pleasure. Manufacturers should undertake rigorous research in large populations, to demonstrate clinical efficacy, a favorable safety profile, and a high level of patient tolerability of sensate lubricants.

Sources of Funding: This study was preformed and funded by *Reckitt Benckiser Ltd.*

P-79.

WOWSS: The Women's Opinions Water-Sexuality Study: Preliminary Results

Michael Krychman, MDCM. So Cal Center for Sexual Health, Newport Beach, CA

Objective: Many individuals may experience sexual boredom from sex primarily in the bedroom and many may choose alternative locations to have explore their sexual activity. Sex in water is often popularized in the media, yet poorly studied in a clinical research setting. We report here on a small sample of cis women who are sexual health care professionals to glean insight on aquatic sexual behavior. **Design:** A random sample of self-identified sexual health professional cis women, who attended a sexual medicine conference were surveyed and asked about sexual behavior in an aquatic setting. All responses were confidential and anonymous. The participants were uncompensated. **Results:** A total of 33 self-identified cis women, who are sexual health professionals, completed the confidential survey and were uncompensated. The Mean age of participants was 45 (mean age 25-64); 24 % were single, 76% were married, and 12% were divorced. 91% considered self-identified as exclusively heterosexual whereas 9% percent were self-identified lesbian or bisexual. This convenience sample engaged in sexual activity a mean time of 1.9 times per week (range 1-4) and 97% had a 1 only one experience per week (range 1-4). The mean duration of their intimate sexual relationship was 14 years (range 0.5-40). 67% of participants described their relationship as better over time whereas 42% used a negative descriptor to describe their sexual relationship over time (worse/dull/boring/a chore/predictable/frustrating. All participants (100%) were sexually active, and 97% used silicone-based lube (Uberlube ®) for aquatic sex. 64% had solo sex with silicone in an aquatic situation. Incidence of Sexual Aquatic locations were as follows: shower (67%); swimming pools (45%); Hot tub (39%), Bath tub (30%), Ocean (9%), Lake (6%). All (100%) of participants feel silicone-based lubricant is safe and effective to use. 64% of participants prefer silicone-based lube irrespective of sexual location (aquatic or not). Only 36% prefer aquatic sexual activity over other places or locations. No participants (0%) reported side effects from water play sexual activity. Overall sexual activity in aquatic situations was highly rated with respect to sexual pleasure: 6.03/10 (sexual pleasure); 6.03/10 (sexual arousal) and 5.67/10 (overall sexual satisfaction). Confidential exit interviews conducted by the sexual medicine specialist indicated common themes of sexual exploration, elimination of sexual hum drum/boring routine sexual activity, plus enjoyment in aquatic environments as key drivers for engaging in aquatic sexual play. **Conclusion:** Sex in aquatic situations appears to be popular amongst cis female individuals. There is an underlying awareness that water-based lubricants may not be helpful in these situations, and all were familiar with silicone-based products. Solo sex as well as partnered play in a variety of aquatic environments are popular with shower play being the most popular. Aquatic sexual activities rate highly with sexual pleasure, arousal and overall sexual satisfaction. Sexual activity in aquatic situations is a popular and under studied. Sexual health care professionals a can be considered aquatic sex play as a recommendation to those suffering from sexual boredom. Further study is warranted with larger populations to further discern the unique characteristics and motivational factors for choosing aqua sex.

Sources of Funding: None

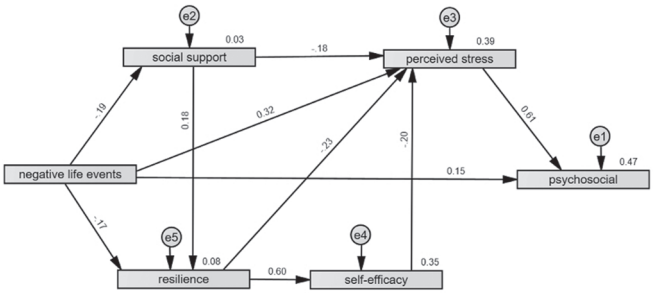
P-80.

Relationship between perceived stress, negative life events, resilience, social support and psychosocial quality of life in menopause: a cross-sectional path analysis model.

Ming Jun (MJ) Kuck, Nicola Paine, Eef Hogervorst. School of Sports, Exercise, and Health Sciences, Loughborough University, London, United Kingdom

Objective: This study aims to explore the relationships between perceived stress, resilience, self-efficacy, social support, negative life events, and psychosocial quality of life in menopausal women using a path analysis approach. Specifically, the study seeks to understand how these factors interact and influence each other and to identify potential intervention targets that could enhance the quality of life of menopausal women. **Design:** This study aimed to validate a theoretical path model built based on the Transactional theory of Stress and Coping (Lazarus & Folkman, 1984) through a secondary analysis using data from a previously published study (Kuck & Hogervorst., 2024). The model assesses the impact of negative life events on the psychosocial quality of life of menopausal women, as well as the mediating role of internal factors (self-efficacy, resilience, perceived stress) and external factors (social support) in the relationship between negative life events and psychosocial quality of life, using path analysis. Path analysis is an extension of multiple regression that helps us better understand complex relationships in intricate models (Streiner, 2005). **Results:** The final model demonstrated a good fit: P=.198, χ^2/df = 1.464, CFI: .995, TLI: .984, SRMR: .027, and RMSEA: .042. Negative life events, the main independent variable, had a significant negative effect on social support (β = -0.186) and resilience (β = -0.174) and a significant positive effect on stress (β = 0.323) and psychosocial quality of life (β = 0.149). Perceived stress significantly positively affected psychosocial quality of life (β = 0.605). This positive effect was also seen between resilience and self-efficacy (β = 0.595) and social support on resilience (β = 0.185). Social support (β = -0.184), resilience (β = -0.235), and self-efficacy (β = -0.200), the mediators, had a significant negative effect on perceived stress. Despite a significant path model, social support, resilience, and self-efficacy did not significantly affect psychosocial quality of life. Thus, these direct paths were removed from the final path model. The total indirect effect of all variables on psychosocial quality of life was β = 0.261. Perceived stress is the strongest significant mediator in the relationship between negative life events and reported psychosocial quality of life (β = 0.195). Serial mediation analysis was applied to test whether social support, resilience, self-efficacy, and perceived stress level mediated the association between negative life events and psychosocial quality of life. All five pathways were significant. Collectively, the final path model explained 47% of the variance in psychosocial quality of life and 39% of the variance in perceived stress. **Conclusion:** Our findings underscore the significance of addressing perceived stress and enhancing protective factors such as social support, resilience, and self-efficacy to improve psychosocial quality of life in menopausal women. Understanding the direct and indirect effects of these factors can guide interventions and treatment strategies aimed at stress reduction, quality of life and mental health of women going through menopause.

Sources of Funding: None



P-81.

A Randomized, Double-Blind, Placebo-Controlled Study to Evaluate the Effects of a Nonhormonal Neurokinin B Inhibiting Supplement on Vasomotor Symptoms in Menopausal Women

Samuel Lederman, MD[1], Mary Jane Minkin, MD[2], Sajitha Sritharan[3], Lila Nachtigall[4], Jevaneeh Rubio[5], Stephanie Recker[5], Lois Lin[5]. [1]Altus Research, Lake Worth, FL; [2]Obstetrics, Gynecology and Reproductive Sciences, Yale Medical School, New Haven, CT; [3]Iglaed, Detroit, MI; [4]Obstetrics and Gynecology, NYU, New York, NY; [5]Nutrasource Pharmaceutical and Nutraceutical Services, Guelph, ON, Canada

Objective: This clinical trial was conducted to evaluate Thermella™, a patented botanical blend of neurokinin B receptor antagonists. The efficacy objectives were to assess the effects of this nonhormonal supplement on vasomotor symptoms (VMS), menopause-related symptoms, and quality of life. The safety profile of Thermella™ was also evaluated. **Design:** In this 12-week, randomized, double-blind, placebo-controlled multicenter study, healthy menopausal women with at least 5 moderate or severe hot flashes per day were randomized to receive either Thermella™ or placebo. Six study visits were included: screening, baseline, three interim visits (Weeks 2, 4, and 8), and end of study (Week 12). Efficacy outcomes included daily diary entries for vasomotor symptoms (VMS) and Hot Flash Related Daily Interference Scale (HFRDIS) scores. In addition, participants had the option to provide blood samples to assess estradiol and metabolic health biomarkers (including liver function) as exploratory efficacy endpoints. Safety was evaluated by adverse event reporting. Results were analyzed via a mixed-design ANOVA with repeated measures model, based on a per protocol analysis with a minimum of 80% compliance (alpha≤0.05). The study was registered on clinicaltrials.gov with ID: NCT05813067. **Results:** Of the 74 participants enrolled, 68 participants completed the trial and 65 were used in the per protocol analyses (Thermella™: 32, Placebo: 33). Significantly reduced occurrences of self-reported total VMS (all severities of hot flashes plus night sweats) at weeks 2, 4, 8, and 12 were reported for Thermella™, which were also significantly less compared to placebo ($p<0.05$) (Thermella™: Baseline: 10.1 ± 2.8; Week 2: 7.2 ± 2.6; Week 4: 5.8 ± 2.6; Week 8: 5.1 ± 2.4; Week 12: 4.0 ± 2.7; Placebo: Baseline: 10.6 ± 5.7; Week 2: 8.9 ± 4.1; Week 4: 9.6 ± 4.8; Week 8: 8.7 ± 5.0; Week 12: 8.0 ± 5.6). Significantly reduced moderate to severe hot flashes at weeks 2, 4, 8, and 12 for Thermella™ were also noted, which were also significantly less compared to placebo ($p<0.05$) (Thermella™: Baseline: 6.3 ± 2.3; Week 2: 4.4 ± 1.8; Week 4: 3.5 ± 2.2; Week 8: 2.7 ± 2.0; Week 12: 1.8 ± 1.9; Placebo: Baseline: 6.6 ± 2.5; Week 2: 5.8 ± 2.7; Week 4: 5.9 ± 3.3; Week 8: 5.0 ± 3.2; Week 12: 4.9 ± 4.0). Significant improvements in the HFRDIS total scores (demonstrated by the percent change from baseline) were found with Thermella™ at weeks 4, 8 and 12, which were also significantly different ($p\leq0.05$) from the inconsistent fluctuations with placebo. No significant difference in liver function tests (Thermella™ n = 12; Placebo n = 11) or estradiol (Thermella™ n = 8; Placebo n = 6) were noted following 12 weeks of supplementation ($p>0.05$). There were no serious adverse events or death in the study, and no adverse events were deemed related to Thermella™. **Conclusion:** This study showed that the botanical blend of neurokinin B receptor antagonists, Thermella™, significantly reduced the frequency and severity of vasomotor symptoms, particularly moderate to severe hot flashes, in menopausal women, with notable improvements observed as early as two weeks. The treatment group demonstrated substantial reductions in the daily life interference caused by hot flashes as evidenced by significant reductions in HFRDIS total scores at Weeks 4, 8, and 12 compared to the placebo group. These results emphasize the rapid efficacy of Thermella™ in mitigating menopausal vasomotor symptoms and improving quality of life. Additionally, Thermella™ exhibited a favorable safety profile. These findings support the use of Thermella™ as a viable and safe intervention for managing vasomotor symptoms in menopausal women.

Sources of Funding: Bonafide Health, LLC

P-82.

Early menopause is not associated with greater blood pressure and sympathetic reactivity to a cold pressor test

Emma J. Lee, PhD[1], Chowdhury Tasnova Tahsin[1], Miguel F. Anselmo[1], William H. Stokes[1], Marnie Vanden Noven, PhD[2], Jason R. Carter, PhD[3], Manda L. Keller-Ross, PhD[1]. [1]Department of Family Medicine and Community Health, University of Minnesota, Saint Paul, MN; [2]Department of Sport Science, Belmont University, Nashville, TN; [3]Robbins College of Health and Human Sciences, Baylor University, Waco, TX

Objective: The risks of hypertension (HTN) and cardiovascular disease (CVD) increase in females after the typical age of menopause (TAM; ~ 51 yrs.). Early menopause (EM; < age 46 yrs.) is associated with even greater augmentation of these risks, but the physiology underlying this discrepancy is not fully characterized. Moreover, postmenopausal females may demonstrate autonomic dysregulation, such as elevated sympathetic (re)activity to stressors compared to premenopausal females or age-matched males, and such dysfunction is also a key contributing factor to CVD. Blood pressure (BP) responses to the cold pressor test (CPT) have been used to predict the development of future HTN. Nevertheless, the applicability of this procedure to older females remains unclear, as does its potential ability to elucidate mechanisms underlying CVD risk linked to EM. The purpose of this study was to test the hypothesis that EM participants would have greater BP and sympathetic reactivity to a stressor (CPT) compared to TAM participants. **Design:** Participants completed two visits. Visit 1: medical and menopause-history questionnaires. Visit 2: instrumentation to measure BP continuously via a noninvasive BP system, heart rate (HR) with a three-lead electrocardiogram, and sympathetic function (muscle sympathetic nerve activity [MSNA]) using the gold-standard technique of microneurography of the fibular nerve; three-min baseline rest followed by 60-s CPT of the left hand. Sympathetic activity was quantified as MSNA burst frequency (BF; bursts/min) and burst incidence (BI; bursts/100 heartbeats). Participants in the EM and TAM groups were matched by age and body mass index (BMI). Results are presented as mean±SD. **Results:** Thirty-four participants (17 TAM, 17 EM) completed all study procedures, and MSNA data was obtained from a subset of participants (12 TAM, 10 EM). Groups were similar in age (TAM: 62±3; EM: 62±4 yrs.), BMI (TAM: 25.5±4.2; EM: 26.1±4.3 kg m^{-2}), and baseline systolic BP (SBP) (TAM: 133±15; EM: 130±22mmHg), diastolic BP (DBP) (TAM: 83±11; EM: 80±12mmHg), HR (TAM: 61±7; EM: 65±9 bpm), and MSNA BF (TAM: 32±10; EM: 28±7 bursts/min) and BI (TAM: 55±14; EM: 46±12 bursts/100 heartbeats) ($p>0.05$ for all comparisons). By design, the EM group had a lower age at menopause than TAM participants (44±2 vs. 51±3, $p<0.001$). During the CPT, SBP, DBP, HR, MSNA BF, and MSNA BI changed similarly from baseline to 60 s in both groups (time effect, $p\leq0.001$ for all). Further, neither age, age at menopause completion, nor time from menopause completion were significantly correlated with changes in SBP, DBP, HR, MSNA BF, or MSNA BI from baseline to 60 s ($p>0.05$ for all tests). **Conclusion:** Among postmenopausal females, EM was not associated with elevated hemodynamic or sympathetic reactivity to a CPT compared with completing menopause at a typical age. However, BP and MSNA responses to other stressors may better illuminate mechanistic factors contributing to the greater CVD risk linked to EM.

Sources of Funding: EJL: NIH F32HL160012; MLKR: K01 AG064038. This work was also supported by the NIH Clinical and Translational Science Award program (UL1TR002494).

P-83.

How to Develop a Culturally Tailored Sleep Intervention for African American Women During Midlife

Sueyeon Lee, PhD. Marcella Niehoff School of Nursing, Loyola University Chicago, Chicago, IL

Objective: Sleep health is vital for physical and psychological well-being, but African American women (AAW) report sleep disturbances such as shorter sleep duration and lower sleep efficiency. Particularly during midlife, coinciding with the menopause transition, women commonly experience sleep disturbances. Moreover, compared to White women, AAW experience their midlife differently, showing higher rates of early menopause, greater vasomotor symptoms, and more depressive symptoms as well as shorter sleep duration, more frequent awakenings, and longer sleep latency. Given the importance of addressing the unique sleep health needs of AAW at midlife along with their perceptions, values, and cultural identity, this study explores strategies for developing culturally tailored sleep interventions for this population. **Design:** For this exploratory study, we searched CINAHL, PubMed, PsychINFO, and Google Scholar to collect information on (1) sleep in AAW during midlife, (2) factors uniquely associated with sleep disturbances in AAW during this period, (3) previous culturally tailored sleep interventions, and (4) means of developing a culturally tailored sleep intervention for this population. **Results:** AAW have been shown to experience significantly shorter sleep duration, longer wake after sleep onset, poorer sleep efficiency, and worse sleep quality than other racial/ethnic groups. Previous studies have reported unique factors contributing to sleep disturbances in this population that include racism-related events, severe vasomotor symptoms, limited access to healthcare, unsafe childhood and current neighborhood environments, suppressed emotions, less interest in sleep improvement, and superwoman obligation. A few studies have applied culturally tailored sleep interventions for AAW at midlife, including tailored behavioral interventions, sleep health education, and cognitive behavioral therapy for insomnia. They have variously employed culturally and linguistically tailored health messages, videos, and other visual content and have addressed unique barriers faced by this population. Furthermore, some have employed a trained health educator familiar with the community's social values, rituals, and rules of conduct. Based on our findings, to develop a culturally tailored sleep intervention for AAW during midlife, researchers and healthcare providers should consider applying several strategies: (1) use linguistically and culturally tailored materials for recruitment and content, (2) incorporate cultural concepts and values such as religious beliefs and spirituality, (3) address population-specific sleep barriers such as stress, particularly racism- and discrimination-related stress, (4) involve family members, as AAW often both rely on family and assume family responsibilities, (5) recruit facilitators from the community, and (6) implement the intervention in culturally familiar settings such as churches. **Conclusion:** The sleep challenges faced by AAW at midlife warrant focused attention and tailored interventions. Culturally tailored interventions hold promise for improving sleep outcomes in this population. By incorporating strategies tailored to AAW during this period, researchers and clinicians can develop interventions that enhance their sleep and overall well-being. In conclusion, there is an immediate need

to develop and implement culturally tailored sleep interventions that involve family and community members in addressing the psychosocial stress and other barriers that detract from sleep health in these women. Moving forward, future research should continue to refine effective approaches, ensuring that they are grounded in the lived experiences and cultural context of AAW, in order to improve their sleep and overall health.
Sources of Funding: None

P-84.

17β-estradiol modulation of hippocampal adiponectin and spatial memory in a rat model of menopause

Lisa Lemajeur, Expected Graduation for D.O.: 2026[1], Yara Zaioor[2], Nupur Patel[2], Stacy Kujawa[2], Alesia V. Prakapenka[2]. [1]Chicago College of Osteopathic Medicine, Midwestern University, Downers Grove, IL; [2]Biomedical Sciences, College of Graduate Studies, Midwestern University, Downers Grove, IL

Objective: Menopause status alters the metabolic and cognitive profiles in women. For example, post-menopausal women typically experience an increase in adipose tissue, which can increase adipokine (e.g., adiponectin) production and release. Interestingly, circulating adiponectin and 17β-estradiol (E2) levels are inversely related such that as E2 levels decline, adiponectin levels rise. Alternatively, studies suggest that E2 increases adiponectin receptor levels in peripheral tissues (e.g., muscle). In the hippocampus, adiponectin receptors AdiopR1 and AdipoR2 have been shown to increase neurogenesis and synaptic plasticity, respectively. E2 has also been linked to increased hippocampal synaptic plasticity, an effect that corresponds to improved spatial memory with E2 treatment. In the present study, we utilized a rat model of menopause to elucidate the relationship between E2 dose, spatial memory, and hippocampal adiponectin and its receptors. We hypothesized that E2 improves spatial memory in a dose-dependent manner, an effect that corresponds to adiponectin and its receptor expression in the hippocampus. Design: Seventy-six 3–4-month-old female Sprague-Dawley rats were ovariectomized to model the decline in circulating ovarian hormone levels associated with menopause. Three weeks after ovariectomy, 24 rats were tested on spatial memory using the spontaneous alternation (SA) task, 24 rats were tested on spatial memory using the delayed spontaneous alternation (dSA) task, and 28 rats were kept behaviorally naïve for hippocampal tissue analyses of adiponectin, AdipoR1, and AdipoR2 relative gene expression using quantitative real-time polymerase chain reaction (qPCR). All rats were randomly assigned to either vehicle (sesame oil), low E2 dose (0.01 µg/day), medium E2 dose (3 µg/day), or high E2 dose (10 µg/day) treatment group. Treatments were administered by subcutaneous injection 48- and 24-hours prior to behavior or tissue collection. Results: When evaluated on the SA task, rats that received high E2 treatment exhibited decreased SA behaviors in relation to vehicle ($p < 0.05$), low E2 ($p < 0.05$), and medium E2 ($p < 0.01$]) treatments, suggesting impaired spatial memory with the high dose of E2. However, when assessed on the dSA task, there were no effects of treatment on SA behaviors. Treatment did not impact adiponectin and AdipoR1 gene expressions in the hippocampus but high E2 treatment decreased AdipoR2 gene expression in the hippocampus compared to the vehicle ($p < 0.05$). There was a trend for decreased hippocampal AdipoR2 gene expression with low E2 relative to vehicle treatment ($p < 0.1$). Conclusion: Our findings suggest that there is an inverse relationship between E2 treatment and hippocampal AdipoR2 gene expression, such that treatment with a high dose of E2 decreased AdipoR2 gene expression in relation to the vehicle. Additionally, high E2 treatment impaired spatial memory compared to the vehicle. It is possible that E2 improvements on spatial memory were not detected in the present study as originally hypothesized due to task parameters implemented in our experimental design, such as the addition of a delay component in the dSA task, type of spatial cues used, and the age of rats. Altogether, the decrease in hippocampal AdipoR2 gene expression and in spatial memory performance with high E2 treatment suggests that E2 and AdipoR2 interact to modulate hippocampal-sensitive memory. This observed interplay between hippocampal AdipoR2 gene expression, E2 dose, and spatial memory in a rat model of menopause posits a possible link between cognitive and metabolic profiles of post-menopausal women.

Sources of Funding: LL was supported by the Chicago College of Osteopathic Medicine Kenneth A. Suarez Research Fellowship. Research was supported by Biomedical Graduate Student Research funds awarded to YZ and NP by Midwestern University.

P-85.

The Midlife Midwife: A Midwife's Impact on Midlife and Menopause Care

Alyson Lippman, DNP[1], Stephanie Patek[2], Jennifer Doering, PhD, RN[1]. [1]School of Nursing, University of Wisconsin, Milwaukee, Shorewood, WI; [2]Physical Therapy, Marquette University, Milwakee, WI

Objective: The gap in menopause care has been identified by research and has made it into popular media and conversation in the United States (US). Symptoms go untreated, leaving millions of women with vasomotor symptoms, mood changes, sleep disturbances and poorer quality of life; and complications like cardiovascular disease, brain health and bone health are not adequately prevented and addressed. The gap is wider for non-white Americans, highlighting racial, ethnic, and educational disparities in healthcare. There are many reasons for the gap, starting with an aging population and challenges to the research itself. Other barriers include insufficient menopause provider education, provider and patient discomfort with menopause conversations, a flood of internet and social media information of varying quality, and a lack of specialized menopause providers. One strategy to address this gap is an Advanced Practice Nurse (APRN), specifically a Certified Nurse Midwife (CNMs), providing specialized menopause care in an outpatient setting. In order to address this need in Milwaukee, WI, a unique, independently-owned menopause midwifery practice was opened in May 2024. **Design:** The CNM engaged in policy advocacy at a state legislative committee, providing testimony for full practice authority in Wisconsin. Despite restricted practice, sufficient collaboration was documented, and the practice was initiated. Participating in the National Science Foundation's Innovation-Corps program, the CNM engaged in customer discovery, with interviews of nearly 50 stakeholders. These include women between the ages of 40-65, independent practitioners, and gynecologists who provide menopause care for their patients. Practice planning included business development using lean principles, and collaboration with providers of pelvic health, acupuncture, cognitive behavioral therapy, physical therapy, and community partners. **Results:** Process outcomes include updates on Wisconsin's APRN Modernization Act, as well as planning and practice implementation and financial review. Patient outcomes include patient satisfaction, improvement of symptoms and complications, and quality of life using the MenQOL Scale. Finally, business outcomes include a practice plan, marketing strategy, budget, and business projections. **Conclusion:** While this practice addresses gaps in menopause on a small scale, engagement with the community, stakeholders and influence on policy make a larger impact.

Sources of Funding: University of Wisconsin Milwaukee Research Foundation

P-86.

Estetrol/drospirenone oral contraceptive impact on lipid parameters in 40-50 year olds

David F. Archer, MD[6], Andrew M. Kaunitz, MD[4], Nina Flerin[2], Ricardo Maamari, MD[3], Jean-Michel Foidart, MD, PhD[5,2], Mitchell D. Creinin, MD[1]. [1]Obstetrics and Gynecology, University of California, Davis, Sacramento, CA; [2]Mithra Pharmaceuticals, Liege, Belgium; [3]Mayne Pharma, Raleigh, NC; [4]Obstetrics and Gynecology, University of Florida, Jacksonville, Jacksonville, FL; [5]University of Liege, Liege, Belgium; [6]Obstetrics and Gynecology, Eastern Virginia Medical School, Norfolk, VA

Objective: The estetrol 15 mg/drospirenone 3 mg combined oral contraceptive is the first clinical product containing estetrol. Estetrol is a native estrogen with receptor and hepatic effects different than other estrogens; the primary selective effects are related to lack of cytochrome P450 metabolism resulting in minimal hepatic impact and antagonism at the estrogen receptor-alpha membrane receptor. Although contraindications to combined oral contraceptives may be more prevalent with increasing age, combined oral contraceptives are commonly used by healthy, older reproductive age patients. To provide more detailed lipid outcome data for individuals in this age group, we compared lipid parameter changes in participants 40-50 years and 16-39 years from the phase 3 estetrol/drospirenone trials. **Design:** We evaluated pooled safety data from two parallel international phase 3 trials that assessed the contraceptive efficacy and safety of estetrol/drospirenone in a 24/4-day regimen for up to 13 cycles. The trials were conducted in Europe and Russia and the United States and Canada. Participants were healthy 16–50-year-old women with regular menstrual cycles, baseline blood pressure <140/90, and body mass index of 18-35 kg/m^2. No individuals were excluded based on baseline lipid parameters although those using lipid-lowering agents were excluded. We compared baseline and end of treatment total cholesterol, low-density lipoprotein (LDL), high-density lipoprotein (HDL), and triglyceride levels among participants 40-50 years old and 16-39 years old. We performed t-tests and considered a difference or change of 10% or more to be clinically significant. **Results:** Of 3417 participants, 223 (6.5%) were 40 to 50 years old and 3194 were 16 to 39 years old. Approximately 205 (91.9%) 40-50 year olds and 2717 (85.1%) 16-39 year olds had both baseline and end of treatment lipid parameter assessents. Lipid paramenters and changes are presented in the table. Cholesterol, LDL, HDL and triglyceride levels were all statistically significantly higher at baseline in older than younger participants; however, all of the differences between age groups and from baseline to end of treatment were less than 10%. Individual change in each lipid parameter did not differ statistically or clinically from baseline within each age group or between age groups. **Conclusion:** Changes in total cholesterol, LDL, HDL and triglyceride levels from baseline to end of treatment in a phase 3 contraceptive trial of estetrol/drospirenone were minimal and did not differ between participants 40-50 years and 16-39 years. These results support that estetrol/drospirenone has a negligible impact on lipid parameters in primarily healthy older users.

Sources of Funding: Estetra SRL, an affiliate company of Mithra Pharmaceuticals

Lipid parameter changes

	Number*	Baseline	End of Treatment	Individual Change from Baseline
Cholesterol (mg/dL)				
40-50 year olds	204	189.9 ± 29.4	185.2 ± 29.4	-4.64 ± 27.5
16-39 year olds	2716	178.3 ± 30.1	173.2 ± 29.0	-5.03 ± 25.5
p-value†		<0.0001	<0.0001	0.80
LDL (mg/dL)				
40-50 year olds	204	109.8 ± 26.7	105.6 ± 27.4	-4.3 ± 24.8
16-39 year olds	2715	101.3 ± 26.7	97.5 ± 26.3	-3.9 ± 21.3
p-value†		<0.0001	<0.0001	0.81
HDL (mg/dL)				
40-50 year olds	205	71.5 ± 17.0	70.4 ± 15.4	-1.2 ± 11.6
16-39 year olds	2715	69.2 ± 16.2	67.7 ± 15.9	-1.5 ± 12.0
p-value†		0.04	0.02	0.75
Triglycerides (mg/dL)				
40-50 year olds	203	107.2 ± 51.4	112.5 ± 52.3	5.3 ± 49.6
16-39 year olds	2717	96.6 ± 48.7	102.8 ± 50.5	6.2 ± 48.7
p-value†		0.002	0.006	0.86

LDL: low-density lipoprotein; HDL: high-density lipoprotein.
***Number with baseline and end of treatment outcomes.**
†comparing 40-50 year old and 16-39 year old groups, t-test.
Data presented as mean ± standard deviation.

P-87.

Filling in the Gaps: Educational Intervention to Improve Menopause Knowledge of Internal Medicine Residents

Mahima Mangla, DO, MPH, MS[1,3], Katherine Killian, MD, MPH[1,3], Sneha Shrivastava, MD[2,3], Rosemarie Lombardi Conigliaro, MD[2,3]. [1]Department of Internal Medicine, Lenox Hill Hospital, New York, NY; [2]Department of General Internal Medicine, North Shore University Hospital, Manhasset, NY; [3]Donald and Barbara Zucker School of Medicine at Hofstra/Northwell Health, Hempstead, NY

Objective: There has been a recent call to action to improve the quality of menopause care in the United States. While primary care doctors play a critical role in providing women's healthcare, they are often unprepared to treat menopause. This deficit in recognizing menopause symptoms and offering appropriate treatments begins early. Current literature highlights that internal medicine (IM) residents lack confidence in managing menopause symptoms, underscoring the need for more education on this topic. The goal of this pilot study is to assess IM residents' menopause knowledge. We evaluated the impact of delivering an overview lecture on key menopause topics with surveys before and after to measure knowledge levels. This pilot study will inform the design of our larger, multi-institutional women's health curriculum. **Design:** This project was conducted at a single academic training program with 44 IM residents ranging from post-graduate year one to three. The lecture was designed by medical educators and physicians who have obtained the Menopause Society Certified Practioner distinction. During resident dedicated didactic sessions, an introductory lecture on menopause was provided. This lecture addressed topics including menopause diagnosis, risk stratification (i.e., cardiovascular, history of cancer, thrombosis, osteoporosis), genitourinary and vasomotor symptoms, and hormonal vs. non-hormonal therapy. A 5-question knowledge survey scored 0-100% was administered both before and after the lectures. The pre-survey was taken right before the lecture and the post-survey after completion of the didactic session. Pre- and post-lecture aggregate knowledge scores were calculated. **Results:** The response rate for the pre-lecture surveys was 87.8% (38/44) and post-lecture survey response rate was 84.7% (37/44). The overall pre-lecture knowledge scores were 44.7% compared with the post-lecture survey score of 89.7%. Notably, residents did not recognize menopause as a clinical diagnosis prior to lectures with only 23.7% correctly answering that diagnostic testing is not required. Importantly, 94.6% of residents understood this point after the lecture. Knowledge of vasomotor symptom treatment improved after the lecture as well (pre: 34.2% vs. post: 89.2%). **Conclusion:** IM resident knowledge about diagnosis and management of menopause is lacking. The lecture was effective at improving baseline short-term knowledge and emphasizes the need for a formal menopause curriculum. As the aging female population is growing, internists will be largely responsible for managing these patients' menopause symptoms. This intervention is an important first step in training our residents on how to obtain a thorough women's health history and treat menopause. Our future work will expand these efforts as we build a robust, multi-centered women's health curriculum for IM residents.

Sources of Funding: Donald and Barbara Zucker School of Medicine at Hofstra/Northwell The Academy of Medical Educators; The Lawrence G. Smith Fund for Innovation in Medical Education

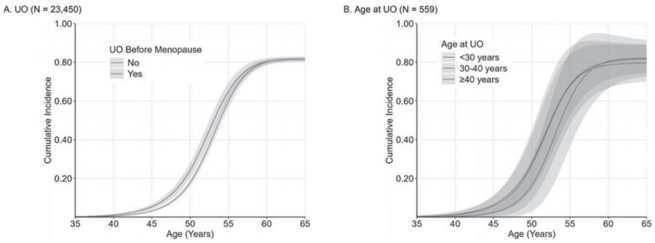
P-88.

Association of unilateral oophorectomy with timing of menopause: a longitudinal cohort study

Erin A. Brennand, MD, MSc[1,3], Natalie V. Scime, PhD[2], Beili Huang, MSc[1], Rebecca Manion[1]. [1]Obstetrics and Gynecology, University of Calgary, Calgary, AB, Canada; [2]Department of Health and Society, University of Toronto, Toronto, ON, Canada; [3]University of Calgary, Department of Community Health Sciences, Calgary, AB, Canada

Objective: This study explored the association of unilateral oophorectomy (UO) on the timing of menopause. It is historically assumed that UO negligibly affects ovarian function, yet primordial follicle number is reduced by half, which may accelerate menopause onset. Two cohort studies have shown women with UO experience menopause earlier than those without UO, and cross-sectional studies identify UO as a risk factor for early menopause. However, these studies are limited by linear or logistic regression which may mask an age threshold where UO is less impactful on menopause timing. As such, a knowledge gap exists on how the timing of UO impacts menopause timing and its downstream health consequences, over the period of midlife aging. **Design:** We conducted a secondary analysis of the Alberta's Tomorrow Project (ATP). The exposure was age at UO performed before menopause. The primary outcome was age at menopause. Secondary outcomes were early menopause (<45 years old) and primary ovarian insufficiency (POI:<40 years old). Selected covariates were: birth year, smoking, age of menarche, parity, infertility, and duration of hormonal contraceptive use. Associations between UO and menopause timing were modeled using flexible parametric survival analysis with non-proportional hazards. Adjusted hazard ratios (AHRs) were reported, and logistic regression used to estimate the relationship between UO and early menopause or POI. The predicted median age at menopause for UO and the reference group was modeled, and AHRs of menopause based upon age at UO were determined, with 95% confidence intervals reported. **Results:** We analyzed 23,450 females, of whom 559 underwent UO prior to experiencing menopause. Our modeling showed earlier timing of natural menopause among women with UO compared to those without UO (Figure 1). AHRs indicated this association was significant before age 53 years and time-dependent, weakening with increasing age at UO. There was a non-linear relationship between age at UO and risk of earlier menopause (Figure 1). The association was largest when UO occurred before 40 years; and attenuated as age at UO approached the typical age of menopause. Predicted age at natural menopause was 52 for those with UO between ages 20-40 and 54 for those with UO between ages 45-50. **Conclusion:** There is an association between age at UO and age at menopause that is strongest when UO is performed prior to age 40 and attenuated thereafter. This study indicates that UO has implications for womens health beyond reproduction and fertility, and urges gynecologic providers to consider ovarian-sparing surgeries for all premenopausal women where appropriate. Further studies are needed to determine if ovarian-sparing surgery can attenuate this risk.

Sources of Funding: Alberta's Tomorrow Project is funded by Alberta Health, Alberta Cancer Foundation, Canadian Partnership Against Cancer and Health Canada, and Alberta Health Services. This secondary analysis is funded by Project Grant Priority Funding in Women's Health Research from the Canadian Institutes of Health Research (Grant no. 491439). N.V.S. is supported by a Banting Postdoctoral Fellowship from the Canadian Institutes of Health Research. E.A.B. is supported by an Early Career Investigator Award from the Canadian Institutes of Health Research.



Cumulative incidence of menopause by UO and age at UO

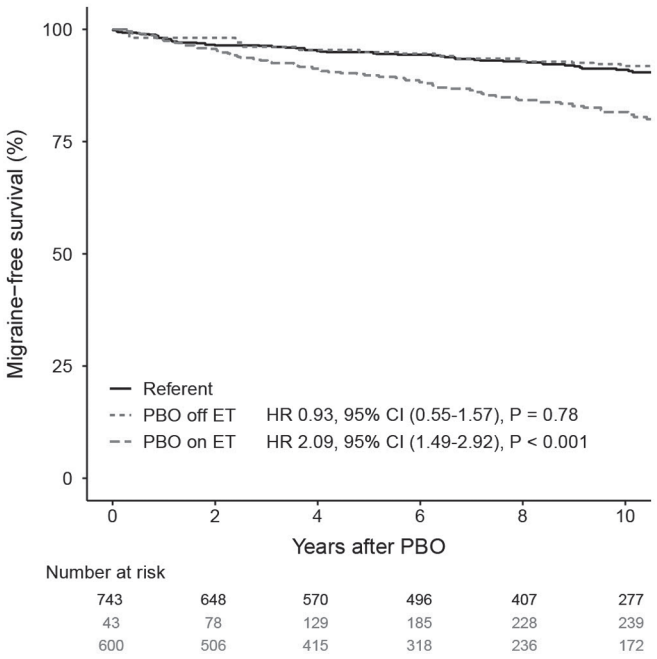
P-89.

Incidence of *de novo* migraine after premenopausal bilateral oophorectomy

Samantha Mannion, MD[1], Carin Smith, BS[2], Walter Rocca, MD, MPH[2,3], Ekta Kapoor, MBBS[1]. [1]Center for Women's Health, Mayo Clinic, Rochester, MN; [2]Quantitative Health Sciences, Mayo Clinic, Rochester, MN; [3]Neurology, Mayo Clinic, Rochester, MN

Objective: Women undergoing premenopausal bilateral oophorectomy (PBO) experience an abrupt decline in estrogen levels. Despite the recognized relationship between estrogen and migraine, little is known about the effects of PBO and estrogen therapy (ET) on migraine. This study examines the effects of PBO on the incidence of *de novo* migraine in a longitudinal cohort. **Design:** The Rochester Epidemiology Project, a medical records linkage system, was used to identify women who underwent PBO at age 49 or younger between 1988-2007 for a non-cancer indication and a group of age-matched referent women. *De novo* migraine diagnoses were confirmed by medical record review. Cumulative risk at 20 years was calculated using the Kaplan-Meier method, and Cox proportional hazards models were adjusted for several potential confounding variables. A censored analysis of women <45 at surgery was also conducted to assess the effects of ET as a time-dependent variable. **Results:** Women who underwent PBO (n=1,243) were at increased risk of migraine compared to referent women (n=1,415); hazard ratio (HR) 1.53 (1.23–1.91; p <0.001). Women <40 years old at surgery were at highest risk; HR 2.29 (1.47–3.57; p <0.001). In the censored analysis, the risk of migraine for women not on ET following PBO was similar to that of premenopausal referent women (HR 0.93; 0.55-1.57; p=0.78), whereas women on ET after PBO were at increased risk (HR 2.09; 1.49-2.92; p<0.001; Figure). **Conclusion:** The risk of *de novo* migraine was increased for women who underwent PBO, particularly for those <40 years old at the time of surgery. This increased risk, however, was confined to the women who received ET following surgery; women who did not receive ET had a risk similar to the referent group. We hypothesize that the new diagnosis of migraine in women after PBO is related to ET use, with the risk being determined by the ET formulation and regimen.

Sources of Funding: Grants U54 AG44170, RF1 AG55151, and R01 AG 058738 from the National Institute on Aging/National Institutes of Health; funds from the Mayo Clinic Research Committee; annual fees paid by REP users.



P-90.

Efficacy of a Nonhormonal Neurokinin 3 Antagonist Botanical Supplement for Reducing Vasomotor Symptoms in Women Who Previously Failed to Respond to Other Non-Drug Treatments

Laura Mason[1], Michaela Alesi[1], Mary Jane Minkin, MD[2], Lila Nachtigall[3], Alyssa Dweck[1], Trisha A. VanDusseldorp[1], James Komorowski[1]. [1]R&D, Bonafide Health, Harrison, NY; [2]Department of Obstetrics, Yale Medical School, New Haven, CT; [3]Obstetrics and Gynecology, New York University School of Medicine, New York, NY

Objective: The primary objective was to evaluate the effects of a nonhormonal, neurokinin 3 antagonist, botanical blend (Thermella™) on hot flashes and night sweats in women who experience menopausal vasomotor symptoms (VMS) who were non-responders to or unsatisfied with other non-drug hot flash products. **Design:** In an open-label study, 44 peri- and postmenopausal women aged 40-65, with a daily average of ≥ 5 VMS and dissatisfaction with previous non-drug interventions, consumed 2 capsules daily of a proprietary blend of curcumin, decaffeinated green tea extract, and spirulina extract. This blend, known for its neurokinin 3 receptor (NK3R) antagonist effects and reduction of neurokinin B (NKB) levels, was assessed for its impact on VMS. Primary outcome: change in total VMS via daily diaries. Secondary outcomes: validated monthly questionnaires (MENQOL, HFRDIS, GCS, PROMIS, MRS) at Baseline and Weeks 4, 8, and 12. Data analyzed using Group x Time Repeated Measures ANOVA (alpha < 0.05). **Results:** Forty-three women (53.7 ± 4.4 yrs) completed 12 weeks of supplementation. Within 2 weeks, 86% showed improvement total VMS by at least one event. By Week 12, the response rate rose to 93%. See Tables 1 & 2 for results. **Conclusion:** The 12-week supplementation with Thermella™, a nonhormonal botanical blend acting as an NK3R antagonist, resulted in significant reductions in VMS. These improvements were evident within 2 weeks of starting the supplementation and continued throughout the study duration. Additionally, there was a consistent decrease in the frequency and severity of these symptoms over time. The supplementation also showed positive effects on menopause-related quality of life and sleep disturbances. These findings demonstrate the promising clinical effectiveness of Thermella™ in managing VMS during the menopausal transition.

Sources of Funding: Bonafide Health, LLC

Table 1

	Average	Standard Deviation	Percent Change	Significance from Baseline
		Total VMS		
Baseline	10.1	4.2	-	-
Week 2	7.4	3.7	-27.1	p < 0.001
Week 4	6.3	4.1	-37.7	p < 0.001
Week 8	5.1	4.3	-49.2	p < 0.001
Week 12	5.0	4.0	-50.5	p < 0.001
		Total Hot Flash		
Baseline	5.9	2.8	-	-
Week 2	4.3	2.3	-26.6	p = 0.003
Week 4	3.7	2.5	-37.0	p < 0.001
Week 8	3.0	2.5	-49.5	p < 0.001
Week 12	2.8	2.6	-51.3	p < 0.001
		Total Night Sweats		
Baseline	4.3	1.9	-	-
Week 2	3.0	1.8	-29.5	p = 0.002
Week 4	2.6	1.8	-39.9	p < 0.001
Week 8	2.2	2.0	-49.1	p < 0.001
Week 12	2.0	1.9	-52.7	p < 0.001

Table 2

	Average	Standard Deviation	Percent Change	Significance from Baseline
		MENQOL		
Baseline	3.7	1.1	-	-
Week 4	2.9	1.0	-21.4	p < 0.001
Week 8	2.7	0.9	-25.4	p < 0.001
Week 12	2.7	0.9	-26.3	p < 0.001
		HFRDIS		
Baseline	36.9	17.1	-	-
Week 4	24.2	18.9	-34.5	p < 0.001
Week 8	15.0	14.7	-59.5	p < 0.001
Week 12	15.1	13.9	-59.1	p < 0.001
		GCS		
Baseline	19.3	7.5	-	-
Week 4	13.8	8.4	-28.5	p < 0.001
Week 8	10.3	6.8	-46.6	p < 0.001
Week 12	8.6	5.3	-55.5	p < 0.001
		PROMIS		
Baseline	31.3	4.5	-	-
Week 4	26.3	6.2	-16.0	p < 0.001
Week 8	23.9	7.2	-23.6	p < 0.001
Week 12	24.0	7.4	-23.3	p < 0.001
		MRS		
Baseline	15.2	5.0	-	-
Week 4	10.5	5.2	-30.9	p < 0.001
Week 8	8.9	5.1	-41.5	p < 0.001
Week 12	8.5	4.7	-44.4	p < 0.001

P-91.

Six Month Efficacy of a Nondrug, Nonhormonal NK3R Antagonist Botanical Supplement for Reducing Vasomotor Symptoms in Menopausal Women Who Were Unresponsive or Dissatisfied with Prior Non-Drug Treatments

Laura Mason[1], Michaela Alesi[1], Mary Jane Minkin, MD[2], Lila Nachtigall[3], Alyssa Dweck[1], Trisha A. VanDusseldorp[1], James Komorowski[1]. [1]R&D, Bonafide Health, Harrison, NY; [2]Obstetrics, Yale Medical School, New Haven, CT; [3]Obstetrics and Gynecology, NYU, New York, NY

Objective: To assess the 6-month efficacy of Thermella™, a nonhormonal NK3R antagonist botanical blend, on vasomotor symptoms (VMS) and quality of life in women who completed an initial 3-month trial and extended for another 3 months, especially those unresponsive/dissatisfied with other non-drug treatments. **Design:** In an open-label study, 44 peri- and postmenopausal women (40-65 y/o) with ≥5 daily VMS took 2 capsules of Thermella™ daily. After 3 months, 33 extended for another 3 months. Primary outcome: VMS reductions via daily diaries. Secondary outcomes: MENQOL, HFRDIS, PROMIS, GCS, and MRS (baseline, months 1-6). Data analyzed using Group x Time Repeated Measures ANOVAs ($\alpha < 0.05$). **Results:** Thirty-three women (53.2 ± 3.8 y/o) completed 6 months of supplementation. After 2 weeks, 82% experienced a reduction of >1 VMS event, with 52% achieving over a 25% reduction and 15% reporting a 50% reduction. These improvements increased to 94%, 88%, and 55% at 3 months, and 97%, 85%, and 52% at 6 months, respectively. See Tables 1 and 2 for data on VMS, hot flashes, night sweats, and questionnaire results. **Conclusion:** Six months of Thermella™ supplementation, a nonhormonal NK3R antagonist, significantly reduced VMS frequency and severity in menopausal women. Improvements were noted within 2 weeks and sustained throughout the study. Thermella™ also enhanced menopause-related quality of life and alleviated sleep disturbances, demonstrating its potential as an effective non-drug alternative for managing VMS.

Sources of Funding: Bonafide Health, LLC

T1

Total VMS	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	10.3	4.4	-	-
Week 2	7.7	3.8	-25.0	p = 0.006
Month 1	6.6	4.2	-36.3	p < 0.001
Month 2	5.2	4.4	-49.9	p < 0.001
Month 3	4.7	3.9	-54.4	p < 0.001
Month 4	5.0	2.3	-51.8	p < 0.001
Month 5	5.1	3.9	-50.4	p < 0.001
Month 6	4.8	3.7	-53.1	p < 0.001
Total Hot Flashes	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	5.9	2.8	-	-
Week 2	4.4	2.3	-25.2	p = 0.16
Month 1	3.8	2.5	-35.6	p < 0.001
Month 2	2.9	2.6	-50.6	p < 0.001
Month 3	2.5	2.5	-57.3	p < 0.001
Month 4	2.7	1.8	-54.2	p < 0.001
Month 5	2.8	2.3	-52.6	p < 0.001
Month 6	2.6	2.1	-55.6	p < 0.001
Total Night Sweats	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	4.4	2.1	-	-
Week 2	3.2	1.8	-26.1	p = 0.42
Month 1	2.7	1.9	-38.3	p < 0.001
Month 2	2.3	2.1	-49.1	p < 0.001
Month 3	2.0	1.5	-53.7	p < 0.001
Month 4	2.4	2.0	-45.7	p = 0.001
Month 5	2.2	1.8	-49.3	p < 0.001
Month 6	2.2	1.9	-49.4	p < 0.001

T2

MENQOL	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	3.7	1.1	-	-
Month 1	2.9	1.0	-21.7	p < 0.001
Month 3	2.6	0.9	-29.7	p < 0.001
Month 6	2.6	0.9	-31.3	p < 0.001
HFRDIS	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	40.3	17.0	-	-
Month 1	25.7	20.1	-36.2	p = 0.002
Month 3	14.6	14.2	-63.9	p < 0.001
Month 6	13.7	15.1	-66.0	p < 0.001
PROMIS	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	32.3	4.0	-	-
Month 1	26.6	6.9	-17.6	p < 0.001
Month 3	23.6	7.4	-26.9	p < 0.001
Month 6	24.0	7.4	-25.7	p < 0.001
GCS	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	19.9	7.4	-	-
Month 1	13.8	9.1	-30.5	p < 0.001
Month 3	8.1	5.3	-59.4	p < 0.001
Month 6	7.5	6.1	-62.1	p < 0.001
MRS	Average	Standard Deviation	Percent Change	Significance from Baseline
Baseline	15.9	4.7	-	-
Month 1	11.0	5.5	-30.6	p < 0.001
Month 3	7.8	4.3	-50.7	p < 0.001
Month 6	8.4	5.3	-47.1	p < 0.001

P-92.

"How am I supposed to be professional with this brain fog?": Understanding Experiences and Perspectives of Menopausal Brain Fog Among Reddit Users

Jade McGrath, BS[2], Eion R. Plenn[1], Omar Duenas Garcia[2]. [1]Penn State College of Medicine, Hershey, PA; [2]West Virginia University School of Medicine, Morgantown, WV

Objective: Memory lapses, concentration issues, and mental fatigue ("brain fog") are common symptoms during the menopausal transition and contribute to significantly decreased quality of life. More so, the subjective nature of these cognitive symptoms poses challenges for diagnosis and management by healthcare providers. By examining narratives shared in online communities such as the r/menopause subreddit, this study aimed to understand how menopausal individuals perceive and experience brain fog and the coping strategies employed by individuals navigating these symptoms. **Design:** This qualitative research employed a thematic analysis approach to explore perspectives on brain fog among menopausal individuals, utilizing data sourced from the online community of r/menopause subreddit. With its 75,000 subscribers, this subreddit is a valuable platform for individuals to exchange experiences, advice, and support regarding menopause-related issues. Data collection involved extracting posts containing the keyword "brain fog" from the subreddit and utilizing APIFY to scrape titles and body text. Following refinement of the dataset to eliminate irrelevant posts, 186 posts spanning 2019-2024 were included in our analysis. Collaboratively, two researchers engaged in inductive coding, identifying emerging themes through an initial review of the data. Subsequently, the coded data were summarized, and final themes were reported. **Results:** Five themes emerged from the data (table 1): symptom dynamics (e.g., variation in symptoms, symptom intensity), impact on quality of life (e.g., professional life, mental health), symptom management (e.g., medications, supplements), frustrations with healthcare (e.g., lack of knowledge, provider bias), and seeking support and community (e.g, sharing advice, encouragement). **Conclusion:** Individuals reported varying experiences with brain fog due to menopause. Experiences reflected a negative impact on daily functioning and quality of life. Individuals also discussed symptom management through medication and lifestyle changes. This study underscores the need for greater awareness among healthcare providers and the importance of tailored interventions to address the unique challenges posed by menopause-related cognitive symptoms.

Sources of Funding: None

Table 1: Qualitative Themes and Quotes

Theme	Description	Quote
Symptom Dynamics	Individuals reported their experiences with brain fog, including specific cognitive impairments such as difficulty finding words, spelling, maintaining focus, and remembering tasks or appointments.	"My ability to spell is worsening by the day and I am finding it more and more difficult to read and comprehend."
Impact on Quality of Life	Individuals mentioned how brain fog significantly impacts both professional (e.g, job performance and education) and personal (e.g, managing responsibilities and relationships) aspects of life.	"I am a professional in finance and both the brain fog and fatigue can be disabling- I do my best to cover it up. I work with all men so I really do not feel comfortable confiding in anyone."
Symptom Management	Individuals described medications, supplements, and lifestyle changes used to alleviate brain fog.	"The brain fog and cognition have gotten so much better since getting on HRT." "Which supplements have helped the most for brain fog?" "I went back to a more simple self-styled bullet journal planning technique and after a month I wanted to share that it really is helping my menopause brain."
Frustrations with Healthcare	Individuals expressed frustrations with healthcare providers due to lack of knowledge, uncertainty about appropriate treatment approaches, and dismissal of hormonal factors contributing to brain fog.	"I made appointments with my OB/GYN and my primary care doctor…I'm worried they're going to say [brain fog] is just my bipolar disorder and that I need new meds or my dose adjusted. Any advice on how to approach my appointments?"
Seeking Support and Community	Individuals found comfort in connecting with others who understood their struggles with brain fog and shared insights, coping mechanisms, and encouragement.	"Would really appreciate hearing from others post-[hysterectomy] and any difficulties you've experienced with memory and concentration. I am really struggling and feel very depressed about this. If you read all the way to here, thank you."

P-93.

The impact of acupuncture treatment on perimenopausal vasomotor symptoms

Stephanie T. McNally, MD[1,3], Jack Miller[2], Debroah McElligott[3], Renee Pekmezaris[2]. [1]OB/GYN, Northwell Health, Garden City, NY; [2]Feinstein, Northwell Health, Manhasset, NY; [3]Katz Institute for Women's Health, Northwell Health, New Hyde Park, NY

Objective: The goal of this study is to examine participants' reduction of vasomotor symptoms and quality of life scores after receiving acupuncture treatment during the late perimenopausal transition at weekly and monthly intervals. **Design:** Fifteen women in the late perimenopausal transition period were recruited at a large health systems's Center for Wellness and Inegrative Medicine. Women who reported >5 vasomotor symptoms per day were self referred based on marketing flyers. Informed consent was obtained by the research team. And women were enrolled if they were not on any medications, herbal treatments, or hormones that could affect their vasomotor symptoms. They received baseline electronic questionnaires about their daily vasomotor symptoms as well as other features of daily life including mood, urinary symptoms, and sexual satisfaction. The questionnaires were sent, stored, and analyzed via REDCAP. Patients received 3 months of treatments with a total of 8 50 minute sessions. Each treatment was the same for each participant at each of the 8 sessions. Repeated measures ANOVAs were conducted to examine various aspects of women's feelings towards their menopause symptoms and quality of life across eleven time points throughout treatment and posttreatment. This study was IRB approved. **Results:** Ten of the 15 patients completed all 8 treatments. 2 particiapants completed 5 sessions while 1 patient only completed 3 sessions and withdrew from the study for pain at the sites of needle placement. Two paricipants did not follow through after the initial recruitment. When analyzed, the results supported that participants did experience a significant decrease in their perception of life dissatisfaction over time after receiving the intervention, $F_{(10,40)} = 2.24$, $p<.05$. Post hoc tests were all nonsignificant. All other factors including feelings towards hot flashes, quality of life, depression, anxiety, sex drive, night sweats, poor memory, frequent urination, muscle aches, were all nonsignificant. Table 1 and 2 **Conclusion:** This small pilot study suggests acupuncture treatment can have a positive impact on a women's life satisfaction, particularly during the late perimenopausal transition period. Though there was not a direct correlation with the acupuncture treatment and a reduction of vasomotor symptoms, improved in satisfaction scores suggest other factors can positively affect women during this time. Future studies, with a larger cohort, may help identify complementary and integrative treatments that may help women.

Sources of Funding: Katz Institute for Women's Health - Northwell Health

P-94.

Menopause Management: Exploring menopause education, attitudes, knowledge and psychological aspects among health professionals and patients

Stephanie T. McNally, MD[1], Vidhi Patel[2], Jack Miller[2], Renee Pekmezaris[2]. [1]OB/GYN, Northwell Health, Garden City, NY; [2]Northwell Health, Manhasset, NY

Objective: The primary goal of our study was to explore the current state of menopause symptoms, education, attitudes, and knowledge among both health professionals and patients, while also delving into psychological aspects related to menopause management. By analyzing these key aspects this study endeavors to shed light on potential areas for improvement in menopause care and psychological support required during this crucial phase. **Design:** A survey methodology was used to conduct this study. XX participants were asked to fill out a questionnaire about their menopause journey, which include topics relating to menopause symptoms, medications, symptom relief, use of social media, and their attitudes regarding use of alternative therapies. Upliv database was use to capture

participant responses at a large tertiary care hospital in New York. IRB approval was obtained prior to study activities **Results:** Participants responded that 37.7% were post menopause i.e. not had a period in over one year, 23.1% perimenopause, 20.4% were not in menopause and 9.6% indicated being in menopause. Additionally, participants indicated that 28.8% had no periods with menopause symptoms, 4.8% had no periods without menopause symptoms, 1.6% had regular periods with menopause symptoms, 12% had regular periods without menopause symptoms, 2% had skipped periods with menopause symptoms and 3.8% had skipped periods without menopause symptoms. Furthermore, a small number of participants 8.6% indicated that that their menopause was caused by other conditions (cancer or gynecological conditions require surgery) and majority 54.4% indicated that their menopause occurred naturally. For overall impact of menopause on quality of life, 29.6% responded with impact on sleep, 20.7% impact on energy level, 12.6% impact on self-confidence, 17.1% impact on physical appearance, 25.4% impact on weight, 11.2% indicated having impact on relationships with their partner family friends or coworkers, 18.8% indicated having impact on sexual drive and or activity, 12.2% participants reported that menopause symptoms had no impact on quality of life, had minimal symptoms and don't need treatments, 8.8% impact on ability to manage stress 4.4% impact on work performance, and 10.1% impact on exercise tolerance. and only 2% indicated no impact on quality-of-life symptoms with well managed with treatments. About half of the participants 50.8% responded that their doctor or healthcare provider did not prescribe any menopause medications or treatments for symptoms and if any were prescribed. Also, approximately 28.1% said yes treatment were helpful, 22.3% participants reported that only "sometimes" menopause treatments were helping or relieving their symptoms and 6% indicated not being helpful. **Conclusion:** Over the years medical advancements and increased awareness have brought significant improvements in managing menopause and alleviating associated symptoms. Successful management of menopause remains a multifaceted challenge due to several factors including limited menopause education among healthcare professionals and patients, varying attitudes towards menopause and gaps in knowledge regarding effective menopause management strategies. Our study aims to contribute valuable insights into these areas which can help shape better approaches to manage menopause care and improve overall well-being and quality of life for women experiences experiencing this transformative like face life phase.

Sources of Funding: None

P-95.

Mens sana in corpore sano: The impact of resilience on climacteric symptoms

Andrea Morales Leal, Clinical Psychologist, Felipe Arturo Morales Martínez, PhD, Otto Hugo Valdés Martínez, PhD, Selene Marysol García Luna, PhD, Luis Humberto Sordia Hernández, PhD, Dra. María Ofelia Sordia Piñeyro, MD. CEUMER, Universidad Autónoma de Nuevo León, Monterrey, Mexico

Objective: To identify the association between psychological resilience and climacteric symptoms **Design:** This was a cross-sectional study performed in the menopause consultation of the Centro Universitario de Medicina Reproductiva (CEUMER) in Monterrey, México, in November 2023. Menopausal women were assessed for levels of resilience, their menopause symptoms, age, BMI, menopause time, medical history, menopause time, and smoking status. Sixty-two participants were considered in this study. After evaluating the distribution of the data, the age, menopause time, BMI, and the Greene Climacteric Scale were compared with the Resilience Scale (ER-14) with a one-way ANOVA with Tukey's multiple comparison or Kruskal-Wallis with Dunn's multiple comparison, depending on the patient's level of resilience. A p-value <0.05 was considered statistically significant. **Results:** No differences were observed in terms of age, BMI, and time of menopause with respect to the level of resilience. In order to know if the resilience of the patients is influenced by the severity of the symptoms of menopause, the Greene Climacteric Scale scores were compared with respect to the level of resilience. Findings showed that patients with very low resilience presented more severe symptoms in the Greene Climacteric Scale score (31.67 ± 11.83) in contrast to those with very high resilience with lower scores (14.79 ± 9.60) ($p=0.011$). When comparing them, a statistically significant difference was found specifically in the depression category scores in patients with very low or very high resilience ($p=0.008$). The anxiety category gave a statistical difference of ($p=0.09$), which, due to the small sample, may not have been sufficiently powered to detect a difference. **Conclusion:** In this study, the perception of climateric symptoms had a negative correlation with resilience. Assessing resilience levels would be of great interest in elucidating the implicated pathways leading to higher scores in climacteric symptoms, particularly in psychological symptoms. Our results shed light on the low levels of resilience with more prevalent climacteric symptoms. Awareness and recognition of psychological symptoms in menopausal woman are crucial for their well-being. Psychological support aiming to promote resilience might help to develop more functional strategies and contribute to better mental health during this life stage.

Sources of Funding: None

P-96.

Development and evaluation of an artificial intelligence chatbot for menopause information using trusted, peer-reviewed, position statements from The Menopause Society

Alex Handy[1,2], Abraham (Nick) Morse[1,3], Ria Gotbi[1], Rebecca Love[1]. [1]Vira Health, London, United Kingdom; [2]University College London, London, United Kingdom; [3]Tufts University School of Medicine, Boston, MA

Objective: Large language models (like ChatGPT) can improve how clinicians and patients access information about menopause care but are vulnerable to generating incorrect information from unknown sources. An Artificial Intelligence (AI) chatbot that generates responses from trusted, peer-reviewed documents like position statements from The Menopause Society (TMS) could be used by both clinicians and patients to access reliable menopause information in a digital, conversational format. This study, therefore, aims to build and evaluate a chatbot for menopause information that is grounded on information from published TMS position statements. **Design:** A chatbot designed to deliver menopause information was created using a technique called 'retrieval augmented generation' (RAG). RAG improves response accuracy and relevance by incorporating relevant content from trusted sources alongside the user's question. Specifically, RAG uses vector embeddings to find similar content from those sources, which are then included in the prompt given to the large language model along with the original question as additional context. The four published TMS position statements (2023 NonHormone Therapy, 2022 Hormone Therapy, 2021 Management of osteoporosis in postmenopausal women, 2020 Genitourinary syndrome of menopause) were used as the trusted input sources and OpenAI's gpt-4-0125-preview was used as the language model. Our evaluation study aimed to address two key questions; will chatbot responses faithfully use content taken only from the trusted TMS position statements and do those responses meet clinical standards for safe and effective use? 40 open-ended menopause questions were developed for evaluation with responses evaluated on a Likert scale (1-lowest, 5-highest) across 4 criteria; faithfulness of responses to the selected content from TMS position statements, relevance to the question asked, potential harmfulness (scale inverted so 5=not harmful) and clinical correctness. Faithfulness was further evaluated using a % score (0-100) calculated by identifying claims made in the response and determining how many of those claims could be directly inferred from the selected TMS position statement content. Responses were evaluated automatically (by prompting a separate large language model, claude 2.1 from Anthropic) and manually by two experienced clinicians. Automatic evaluations were run 3 times to account for potential variations in responses, with an overall average (and individual averages) reported across clinicians and the automatic evaluator for each criteria. **Results:** The chatbot demonstrated that it faithfully used content only from TMS position statements with an average score of 4.43 (auto=3.67, clinician1=4.95, clinician2=4.68). This was further supported with a 95% faithfulness score in the automated claims analysis. The chatbot responses also scored highly on relevance to the question 4.59 (auto=4.31, clinician1=4.88, clinician2=4.58) and clinical correctness 4.44 (auto=4.05, clinician1=4.88, clinician2=4.40). For both answer relevance (4.73) and clinical correctness (4.64) the average manual clinical review score was even higher. Potential harmfulness was almost exclusively assessed as "not harmful" across all responses with an average score of 4.93 (auto=5.00, clinician1=4.98, clinician2=4.80) and only 1 question assessed as potentially "Moderately harmful" by 1 clinician. **Conclusion:** In this study an AI chatbot was successfully constructed to provide menopause information grounded on information from published TMS position statements. Evaluation of the chatbot's responses demonstrate the potential for clinical use given the high levels of clinical correctness and low risk of potential harm. Further research is required to build additional guardrails prior to clinical use and to support the integration of other types of trusted, peer-reviewed documents.

Sources of Funding: Vira Health

P-97.

Abnormal PAP smears are one of the earliest signs of Genitourinary Syndrome of Menopause

Sarah Mourtada[1], Yanicka Shepherd[1], Monica Pevida, medical student[1], Alberto Dominguez-Bali[2]. [1]OBGYN, American University of Antigua College of Medicine, Miami, FL; [2]Miami Center of Obsterics and Gynecology, Miami, FL

Objective: Background/Objective: Since 2010, our observation in two Miami, Florida centers has revealed a significant trend among perimenopausal women referred by Primary Care Physicians, showing various degrees of cervical dysplasia on PAP smears (ASCUS, LGSIL, HGSIL with or without HPV). Many of these women had previously normal PAP results, with over 60% having a normal PAP smear just a year prior, now diagnosed with LGSIL or HGSIL. This prompted investigation into the role of vaginal atrophy in mimicking dysplastic cells and the efficacy of local vaginal estrogen therapy in resolving these abnormalities. **Design: Methods:** Since 2012, we initiated a protocol involving local vaginal estrogen therapy for women exhibiting atypical PAP smear results attributed to vaginal atrophy. Properly administered estrogen therapy for at least four months resulted in complete resolution of "dysplasia" in over 96% of cases. Follow-up over four years on hormone therapy showed no recurrence of abnormal PAP results. **Results: Results:** Our intervention with local vaginal estrogen therapy has demonstrated remarkable efficacy, with over 96% of cases experiencing complete resolution of abnormal PAP results following treatment. Notably, this intervention has the potential to reduce unnecessary procedures such as colposcopies, biopsies, and excisions, leading to significant cost savings and improved patient outcomes. **Conclusion: Conclusion:** Our findings underscore the significance of recognizing vaginal atrophy as a potential cause of abnormal PAP smears in perimenopausal women. Local vaginal estrogen therapy represents an effective and safe intervention for resolving these abnormalities, reducing the need for invasive procedures and improving patient care and outcomes.

Sources of Funding: None

P-98.

Clinical Hypnosis and Cognitive Behavioral Therapy for Hot Flashes: A Scoping Review

Vanessa Muniz, Victor Julian Padilla, Cameron Alldredge, Gary Elkins, Ph.D.. Psychology & Neuroscience, Baylor University, Waco, TX

Objective: Hot flashes are common among postmenopausal women, yet conventional treatments like hormone therapy can have adverse side effects. The North American Menopause Society's (NAMS) 2023 nonhormone therapy position statement reported level 1 evidence for CBT and clinical hypnosis based on their good and consistent scientific evidence, however a thorough comparison of their effectiveness is needed. This scoping review expands upon the nonhormone therapy position statement (NAMS, 2023) by further addressing the efficacy and clinical significance of cognitive behavioral therapy (CBT) and clinical hypnosis in the reduction and management of hot flashes among menopausal women and breast cancer survivors. **Design:** A comprehensive search in accordance with the updated PRISMA extension guidelines for reporting scoping reviews (Tricco et al., 2018) was conducted from December 2023 to January 2024 using PubMed, Web of Science, and PsycINFO databases. Eligible studies published in English, peer-reviewed journals were included if they investigated CBT or hypnosis-based interventions for hot flashes in women aged 18 years or older. Studies were excluded if they lacked a control or comparison group, or were classified as reviews, meta-analyses, commentaries, and research protocols. This scoping review synthesized findings from 23 studies, spanning from 1996 to 2022, and examined various geographical distributions and methodologies. Essential data such as authors, publication year, country of study, title, study design, participant demographics, intervention type, control group presence, primary and secondary outcomes, as well as key findings, were systematically extracted for subsequent analysis and discussion. **Results:** Eight studies administered clinical hypnosis, and 15 studies administered CBT for the treatment of hot flashes. Clinical hypnosis interventions consistently demonstrated clinically significant efficacy in reducing hot flash frequency and severity, as well as improving quality of life, sleep quality, and mood. In contrast, CBT interventions showed mixed findings, with small or null effects on hot flash frequency reduction and focus primarily on reducing stress associated with hot flashes through cognitive restructuring. Only four studies assessed hot flashes using skin conductance monitors. These studies found that CBT did not reduce physiologically measured hot flashes, whereas clinical hypnosis had a significant reduction of over 60%. **Conclusion:** While both CBT and clinical hypnosis are endorsed by the NAMS 2023 nonhormone therapy position statement as level 1 treatments for hot flashes, this scoping review uncovered significant disparities between the outcomes of the interventions. Both CBT and Clinical hypnosis demonstrated ancillary benefits such as the psychological well-being in individuals experiencing hot flashes; however, the review suggests that only clinical hypnosis was effective intervention for directly reducing hot flashes in addition to improving associated symptoms and quality of life. Additionally, clinical hypnosis is the first behavioral intervention to achieve significant reductions of physiologically recorded hot flashes. Mediators and moderators of intervention effect are also discussed, and hypnosis may act through mechanisms beyond response expectancy or placebo effects, potentially altering activity in the medial preoptic area of the hypothalamus. Future research should explore neurophysiological mechanisms of hypnosis, innovative delivery methods such as smartphone apps, and tailor interventions to individual characteristics for optimized outcomes in managing hot flashes.

Sources of Funding: None

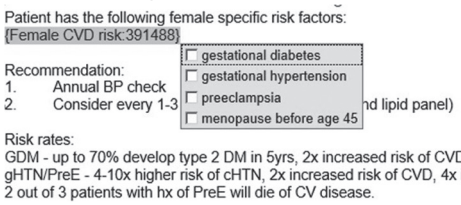
P-99.

At Risk for Cardiovascular Disease due to Reproductive Risk Factors: A New Workflow to Recognize, Record and Recommend

Sara Murphy, MD. OB/GYN, Kaiser Permanente, Los Gatos, CA

Objective: It is recognized that certain gynecologic or obstetric diagnoses, to include gestational diabetes, gestational hypertension, preeclampsia or menopause before age 45 increase a patient's risk for heart disease later in life. As cardiac disease is the number one cause of death in women, recognition of individuals with these diagnoses and recording these risk factors in the medical record provides acknowledgment on the part of both providers and patients of this risk, allowing for closer monitoring and intervention. **Design:** At Kaiser Permanente Northern California, we created a workflow in 2023 to identify individuals with a reproductive risk factor placing the patient at increased risk for CVD, and provide written patient education on managing health. Providers in both the OB/GYN and Primary Care Departments have been educated on this workflow, which fits seamlessly into the EPIC electronic medical record system. At a patient's routine or postpartum visit (whichever is applicable), patients with a recognized reproductive risk diagnosis placing the patient at an increased risk of cardiovascular disease has the diagnosis "At Risk for Cardiovascular Disease" placed in the problem list. A subtext with a drop down menu listing the recognized diagnoses from which a provider selects the appropriate diagnosis/es is placed by the provider by simply adding a key phrase to the "At Risk for Cardiovascular Disease" diagnosis (see image below). Risk rates are included to support provider counseling. Leveraging our integrated care system, women with a history of gestational diabetes, will have an order for a yearly HgbA1C automatically entered. For patients with a hypertensive disorder of pregnancy, a banner is added to the medical record clearly indicating the need for yearly blood pressure monitoring. Extensive patient messaging has been created that will be shared with patients on recognition of their increased risk via a short simple phrase placed into the after visit summary by the provider. In addition to reminding patients of their increased risk, this messaging provides actionable protocols (with links to Health Education resources) that patients can take to minimize their risk. Polls have shown that most of our patients are not aware that CVD is the number one cause of death in women. However, when pulic health campaigns have made women more aware of their risks, rates of CVD were significantly reduced. Yearly appointments with a provider along with periodic laboratory evaluation is encouraged. **Results:** ongoing **Conclusion:** We plan a retrospective chart review to compare the percentage of women who had a diagnosis in the problem list acknowledging their increased risk for heart disease in the two years prior compared to the two years after instituting this workflow. We anticipate that the rate of documentation of risk factors for cardiovascular disease in women will be markedly increased, in addition to a significant rise in patient education regarding these risk factors and potential lifestyle changes. Several years will be required to evaluate the long-term health benefits of this program. The goals of this program are to RECOGNIZE those women with an obstetric or gynecologic diagnosis that places them at an increased risk for cardiovascular disease, RECORD this in the problem list and RECOMMEND actionable protocols for patients and providers. Lifestyle modifications by the patient are recognized to be the most impactful intervention on cardiovascular disease reduction. A long-term decrease in the rate of cardiovascular deaths is anticipated.

Sources of Funding: None



P-100.

Unveiling the Top Symptoms of Women in Menopause: Beyond Hot Flashes

Anastasiia Neelagaru, MD, Natalie Givargidze, AGNP-C, Stacy Ammerman, DO, Ann Boss, CNM, Heather Hirsch, MD. Heather Hirsch, MD collaborative, Yaphank, NY

Objective: The narrative in recent years surrounding menopause has primarily been shaped by media representations and societal conversations, which often highlight symptoms such as hot flashes as central to the menopausal experience. Recent policy initiatives signed by the White House in early-mid November underscore a growing need to address gaps in midlife care for women. In this evolving landscape, it becomes crucial to directly engage with women to understand their concerns and needs during menopause. This study aims to elucidate the priorities and challenges women face in midlife. Primarily in the context of menopause, Hormone Replacement Therapy (HRT), insurance coverage, sexual health, and other related areas. A social media-based survey was employed to capture women's voices on these issues. **Design:** A comprehensive poll was disseminated via social media to gather insights from women navigating midlife and menopause. The survey was designed to identify the aspects of midlife care that women find most pressing including nut not limited to menopause symptoms, HRT, insurance coverage, and sexual health. **Results:** The survey garnered 366 responses, revealing insightful trends that diverge significantly from the commonly portrayed menopausal narrative. Contrary to the prevalent emphasis on hot flashes, which ranked sixth at 48%, the findings spotlight brain fog and sleep disturbances as the most pressing concerns, with 73% of respondents identifying brain fog as their top issue. Additionally, sleep-related challenges were prominently highlighted. Of note, 49% of respondents are employed full-time and a total of 71% are employed in some capacity. This demographic shift highlights the necessity of addressing menopausal symptoms within the context of women's broader life roles. The survey indicates a substantial reliance on social media for information as 71% of participants seek answers online. 79% of women currently consult their primary care providers or gynecologists for menopausal care. **Conclusion:** While the study's online, self-directed poll methodology may introduce limitations, the findings align with subjective clinical experiences reported in other studies suggesting a noteworthy gap between media representations and women's lived experiences of menopause. This discrepancy highlights the importance of re-evaluating the focus of menopausal care and information dissemination. The significant reliance on social media for information, coupled with a preference for consulting healthcare professionals, indicates a potential area for enhanced educational efforts and support. This study contributes to a deeper understanding of the real concerns and needs of women during menopause.

Sources of Funding: none

Choices	Response %	Response count
Brain fog	72.31%	269
Low libido	68.55%	255
Joint aches and pains	67.74%	252
Vaginal dryness	57.26%	213
Night sweats	49.19%	183
Hot flashes	48.66%	181
Other	33.87%	126
Irregular or bothersome bleeding	24.73%	92
None, but still interested in how hormones affect women's health	2.96%	11
None - yet	0.27%	1

P-101.

Periodontitis at Midlife: Secondary Analysis of National Health and Nutritional Examination Survey data 2011-2014

Marie - Claire O'Dwyer, MB BCh BAO MPH[1], Nicoll Capizzano[1], Wendy Furst[3], Manasi Ramakrishnan, MD[4], Ananda Sen, PhD[1,2], Michael Klinkman, MD[1], Allison Furgal, PhD[2]. [1]Family Medicine, University of Michigan, Ann arbor, MI; [2]Biostatistics, University of Michigan, Ann Arbor, MI; [3]Internal Medicine, University of Michigan, Ann Arbor, MI; [4]Family Medicine, Mayo Clinic, Scottsdale, AZ

Objective: Periodontitis is a chronic inflammatory condition affecting the support structures of the tooth. Clinical presentations span a broad spectrum: asymptomatic; painless bleeding gums, dental pain and tooth loss. Often misperceived as solely a dental disease, it is one of the more common chronic systemic inflammatory conditions impacting >30% of US adults. Treating periodontitis can have beneficial impacts on systemic health – for example treating periodontitis in patients with diabetes can improve glycemic control. Ageing is a key risk factor for development of periodontitis, but little is known about the impact of the menopause transition on the prevalence of periodontal disease. Our objective was to determine the association between menopause and periodontitis. **Design:** The National Health and Nutrition Examination Surveys from 2011-2014 included full mouth periodontal examinations performed by dentists. A secondary analysis of these data was performed among 3285 women who had undergone a complete periodontal examination. The prevalence of periodontitis among postmenopausal and premenopausal people were compared. Multiple imputation was performed to deal with missing data. A weighted logistic regression model was used to investigate the association between post-menopause and periodontitis, adjusting for the following covariates: age, race/ethnicity, education, income, insurance status, smoking and alcohol consumption. **Results:** The prevalence of periodontitis was 40% among postmenopausal participants in the NHANES 2011-2014, compared with 25% among premenopausal participants. However, in the adjusted analysis the odds of periodontitis were similar between pre- and post-menopausal participants OR 0.97 (0.82-1.16), suggesting that the hormonal changes of the menopause transition itself do not confer an increased risk of developing periodontitis. **Conclusion:** Periodontitis is an often overlooked chronic inflammatory condition highly prevalent in postmenopausal patients. In our study the increased rates of periodontitis among menopausal women appeared to be explained by ageing and presence of other risk factors for periodontitis. While dentists manage periodontitis, promoting optimal oral health is an important facet of holistic primary care of women at midlife and beyond.

Sources of Funding: None

P-102.

Gonadotropin trajectories in postmenopausal women

Heather M. Ochs-Balcom, PhD[1], Yihua Yue[1], Jennifer Bea[2], Kathleen Hovey[1], Jean Wactawski-Wende[1], JoAnn Manson[3], Denise Roe[2], Janet Funk[2], Andrew Odegaard[4], Shelby Ziller[2], Matthew Allison[5], Robert Wallace[6], Su Yon Jung[7], Jane Cauley[8]. [1]Epidemiology and Environmental Health, University at Buffalo, Buffalo, NY; [2]University of Arizona, Tucson, AZ; [3]Harvard University, Boston, MA; [4]University of California Irvine, Irvine, CA; [5]University of California San Diego, San Diego, CA; [6]University of Iowa, Iowa City, IA; [7]University of California Los Angeles, Los Angeles, CA; [8]University of Pittsburgh, Pittsburgh, PA

Objective: While growing evidence suggests that gonadotropins may play an important role in aging-related changes in body habitus and adverse health outcomes, follicle stimulating hormone (FSH) and luteinizing hormone (LH) changes after menopause have not been well described. We sought to characterize patterns of FSH and LH change after menopause. **Design:** In a sample of postmenopausal women from the Women's Health Initiative OsteoPerio study who were not using hormone therapy (N=291, mean age at baseline of 62.6 (SD=6.8) years), we estimated FSH and LH trajectories at four visits over a 20-year period using group-based trajectory models, an application of finite mixture model, for clustering of longitudinal measurements. Descriptive statistics were used to identify differences according to hormone trajectory group. **Results:** We estimated three FSH trajectories, which represent three patterns where women are members of one trajectory over the 20 years of follow-up. Trajectory 1, the lowest, had stable FSH levels over time (N=105); trajectory 2 had a stable FSH that started to increase 30 years after menopause (N=154); and group 3, the highest FSH trajectory (N=32), experienced a relatively steep initial FSH decline followed by a slight increase roughly 20 years after menopause. The two highest FSH trajectory groups had higher LH concentrations, did not differ according to surgical menopause status, were more likely to be never smokers, and had lower measures of adiposity (derived from dual-energy x-ray absorptiometry) at baseline. Similarly, we estimated three LH trajectories. In trajectory 1, the lowest, LH steadily declined over time (N=86); trajectory 2 had moderate LH decline followed by an increase 30 years after menopause (N=163), and trajectory 3, with the highest LH, showed a LH decline followed by an increase starting 30 years after menopause (N=42). The two higher LH trajectory groups had higher FSH concentrations, did not differ according to surgical menopause status, and had lower measures of adiposity at baseline. **Conclusion:** In women not using hormone therapy, there is variability in gonadotropin levels in the postmenopausal period. More research is needed to study whether gonadotropin variability after menopause is related to aging-related outcomes.

Sources of Funding: This study is supported by National Institutes of Health (5R01CA258436-03 to Bea and Ochs-Balcom), Breast Cancer Research and Education Fund through New York State Department of Health (Contract No. C34926GG to Ochs-Balcom). The WHI OsteoPerio study was supported by NHLBI-CSB-WH-2016-01-CM, DOD No. OS950077, NIH R01 DE13505, and R01DE024523. The WHI is funded by the National Heart, Lung, and Blood Institute (contract Nos. HHSN268201600018C, HHSN268201600001C, HHSN268201600002C, HHSN268201600003C, HHSN268201600004C; and contract Nos. 75N92021D00001, 75N92021D00002, 75N92021D00003, 75N92021D00004, and 75N92021D00005.

P-103.

Associations between sleep, memory, and sleep vasomotor symptoms among postmenopausal women.

Alexandra Paget-Blanc, BS[1], Rebecca Thurston[3,4], Yuefang Chang, PhD[5], Pauline Maki, PhD[1,2]. [1]Department of Psychiatry, University of Illinois at Chicago, Urbana, IL; [2]Department of Psychology, University of Illinois at Chicago, Chicago, IL; [3]Department of Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA; [4]Department of Epidemiology, University of Pittsburgh, Pittsburgh, PA; [5]Department of Neurosurgery, University of Pittsburgh, Pittsburgh, PA

Objective: Although brain fog is a common menopause symptom, the factors that contribute to cognitive difficulties at menopause are not fully characterized. Verbal memory, but not other cognitive abilities, reliably declines with advancing menopause stage. Similarly, objectively assessed VMS reliably associate with declines in verbal memory. Sleep disturbance also associates with cognitive difficulties, but the pattern of findings differs across studies. Actigraphy-assessed sleep, particularly wake after sleep onset (WASO), has been variably associated with poorer verbal learning and memory, and executive function. No study to date has examined the extent to which sleep VMS might account for associations between sleep disturbance and cognitive performance or the extent to which sleep may affect other cognitive domains such as visuospatial ability. The goal of the present study was to test whether greater actigraphy-assessed sleep disturbance was associated with poorer performance on a comprehensive cognitive test battery in postmenopausal women and whether any associations were explained by the frequency of sleep VMS. **Design:** The sample included 217 cognitively unimpaired postmenopausal women (mean age=59 years) from the MsBrain study. Exclusion criteria included: stroke/cerebrovascular accident, brain injury, brain tumor, dementia, Parkinson's disease, use of hormone therapy or SSRI/SNRI antidepressants in past 3 months. Participants completed: 1) 72-hour of sleep actigraphy, yielding wake after sleep onset (WASO), a measure of sleep disturbance; 2) 24-h of ambulatory VMS monitoring yielding objective measure of VMS; and 3) a neuropsychological test battery including measure of verbal memory (California Verbal Learning Test; CVLT) processing speed (Symbol Digit Modalities Test; SDMT), visuospatial ability (Card Rotation Test; CRT), working memory (Letter Number Sequencing; LNS) and verbal and semantic fluency. Associations between sleep disturbance and cognitive performance was examined using stepwise multiple linear regression. Model 1 was adjusted for age, race, education, mood and BMI. Model 2 was further adjusted for sleep VMS. **Results:** Higher WASO was associated with poorer short-delay verbal memory [B=-.70, p<.05], long-delay verbal memory [B=-.81, p<.05], and semantic clustering [B=-.29, p<.05] on the CVLT as well as poorer processing speed [b=-.34, p<.001], visuospatial function [b=-8.95, p<.05] and working memory [b=-.81, p<.05]. Those associations remained statistically significant after adjusting for sleep VMS. **Conclusion:** Independent of sleep VMS, WASO may contribute affect a broad range of cognitive functions in late midlife women, including visuospatial difficulties. Broadly this work advances understanding of the factors contributing to brain fog. Specifically, menopause stage, VMS and WASO appear to contribute to declines in verbal memory, while sleep disturbance, specifically WASO, may uniquely contribute to difficulties in processing speed, mental rotation and working memory. Women experiencing sleep difficulties may experience broad cognitive benefits from sleep interventions.

Sources of Funding: Funded by NIH Grants RFA1AG053504 (Thurston & Maki)

P-104.

Hormone replacement therapy after bilateral oophorectomy for the treatment of ovarian cancer in premenopausal women

Jinsol Park[1], Soo Jin Park[1], Ji Yeon Han, MD[1,2], Sung Woo Kim, MD[2,3], Hoon Kim, MD, PhD[2,3], Seung-Yup Ku, MD, PhD[2,3]. [1]Obstetrics and Gynecology, Seoul national university hospital, Soeul, Korea (the Republic of); [2]Obstetrics and Gynecology, Seoul National University College of Medicine, Seoul, Korea (the Republic of); [3]Institute of Reproductive Medicine and Population, Medical Research Center, Seoul, Korea (the Republic of)

Objective: This study aimed to investigate factors influencing the prescription of hormone replacement therapy (HRT) in patients with ovarian cancer after bilateral oophorectomy(BO). **Design:** This retrospective study included ovarian cancer and borderline ovarian tumor patients who underwent BO at a single center from June 2003 to December 2023. Factors analyzed included age at BO, time to recurrence, cancer type, stage, histology, NAC and AC administration, recurrence, and HRT regimen within 5 years post-BO. **Results:** Among the 184 patients, 46.7%(86/184) were in the HRT group and 53.3%(98/184) in the non-HRT group, and 75.6%(65/86) were treated with estrogen-only therapy. The mean age at BO was similar between groups(39.66±4.96 vs 38.88±5.82 years, p=0.181). Patients in stages III and IV had a lower rate of HRT use (44.9% vs 25.6%, 24.5% vs 12.8%, p<0.001). The NAC (11.2% vs 3.5%, p=0.036) and AC (92.9% vs 82.6%, p=0.019) was more frequent in the non-HRT group. There was no statistically significant difference in histologic type between the non-HRT group and the HRT group. The time to recurrence was not statistically significant, but it was longer in the HRT group (36.53 vs 24.79 months, p=0.083). Logistic regression showed age at BO and stage significantly influenced HRT use after adjusting for recurrence, NAC, and AC. Patients older than 41 at BO were less likely to receive HRT(OR 0.406 [0.180, 0.917], p=0.030). Patients with stages III(OR 0.286 [0.140, 0.587], p=0.001) and IV(OR 0.227 [0.092, 0.560], p=0.001) were less likely to be prescribed HRT compared to stage I. **Conclusion:** Patients aged 41 or older with BO and advanced ovarian cancer (≥ stage 3) showed reduced HRT use. Histologic type, NAC, AC, and recurrence didn't significantly affect HRT prescription.

Sources of Funding: None

Comparison of clinical characteristics according to HRT utilization

	All (n=184)	Control(n=98)	HRT(n=86)	p
Age at bilateral oophprectomy (years)	39.30±5.381	39.66±4.96	38.88±5.82	0.348
Time to recurrence (months)	29.70 (IQR 9.00, 38.00)	24.79 (IQR 9.00, 35.00)	36.53 (IQR 11.75, 43.00)	0.083
Cancer type (%)				0.354
Epithelial ovarian cancer	79.9(147/184)	79.6(78/98)	80.2(69/86)	
Non-epithelial ovarian cancer	6.5(12/184)	5.1(5/98)	8.1(7/86)	
Double primary cancer (Ovarian cancer + Uterine cancer)	2.7(5/184)	3.1(3/98)	2.3(2/86)	
Other primary cancer (Metastatic ovarian cancer)	5.4(10/184)	8.2 (8/98)	2.3 (2/86)	
Borderline tumor	5.4 (10/184)	4.1 (4/98)	7.0 (6/86)	
Stage (%)				<0.001
I	38.6(71/184)	27.6(27/98)	51.2(44/86)	
II	6.5(12/184)	3.1(3/98)	10.5(9/86)	
III	35.9(66/184)	44.9(44/98)	25.6(22/86)	
IV	19.0(35/184)	24.5(24/98)	12.8(11/86)	
Histology (%)				0.304
High grade serous carcinoma	32.1(59/184)	37.8(37/98)	25.6(22/86)	
Low grade serous carcinoma	9.8(18/184)	9.2(9/98)	10.5(9/86)	
Mucinous carcinoma	9.2(17/184)	9.2(9/98)	9.3(8/86)	
Clear cell carcinoma	14.1(26/184)	14.3(14/98)	14.0(12/86)	
Endometrioid carcinoma	15.8(29/184)	12.2(12/98)	19.8(17/86)	
Germ cell tumor	2.7(5/184)	2.0(2/98)	3.5(3/86)	
Sex-cord stromal tumor	1.1(2/184)	1.0(1/98)	1.2(1/86)	
Mixed	3.3(6/184)	4.1(4/98)	2.3(2/86)	
Other	7.6(14/184)	9.2(9/98)	5.8(5/86)	
NAC (%)	7.6(14/184)	11.2(11/98)	3.5(3/86)	0.036
AC (%)	88.0(162/184)	92.9(91/98)	82.6(71/86)	0.019
Recurrence (%)	36.4(67/184)	42.9(42/98)	29.1(25/86)	0.053

*** data were presented as mean±SD or median(interquartile range)**
*** HRT; hormone replacement therapy, NAC; neoadjuvant chemotherapy, AC; adjuvant chemotherapy**

Logistic regression analysis of HRT utilization

	Adjusted OR (95% CI)	P
NAC	0.506(0.124, 2.066)	0.343
AC	0.572(0.196, 1.668)	0.306
Recurrence	1.039(0.497, 2.172)	0.918
Age at bilateral oophorectomy		0.083
≤ 35	1.0	
36-40	0.418(0.158, 1.104)	0.079
≥ 41	0.406(0.180, 0.917)	0.030
Stage		0.001
I	1.0	
II	1.736(0.423, 7.132)	0.444
III	0.286(0.140, 0.587)	0.001
IV	0.227(0.092, 0.560)	0.001

*** HRT; hormone replacement therapy, NAC; neoadjuvant chemotherapy, AC; adjuvant chemotherapy**

P-105.

Implementation of an innovative decision support tool to deliver comprehensive individualized menopause care

Rajita Patil, MD, Erica Oberman, MD, Brittany Davis, MD. OBGYN, UCLA, Encino, CA

Objective: Menopause is a highly individualized experience, influenced by a unique combination of genetic factors, lifestyle choices, health status, symptoms, and personal values, all of which affect short-term quality of life and long-term chronic disease risk. Providing high-quality menopause care necessitates a personalized approach that considers these diverse patient factors and the extensive organ systems impacted by menopause's biological changes. Addressing this complexity within the constraints of a brief medical visit is challenging. With half of the population experiencing menopause and an increasing public demand for quality care, there is a pressing need for efficient delivery of such services. Currently, there is no technology-enhanced clinical decision support tool available to assist healthcare providers in offering comprehensive, individualized menopause care through a scalable, standardized approach. **Design:** Certified menopause providers at the UCLA Comprehensive Menopause Program, in collaboration with specialists, have developed specialty-specific menopause care algorithms. These algorithms are based on evidence-based guidelines, validated surveys, and clinical expertise, and have been programmed to produce ten distinct reports covering areas such as cognition, bone health, sleep, mental health, breast health, cardiovascular health, vasomotor symptoms, genitourinary health, and integrative health. These reports provide a detailed overview of a patient's condition before their visit, highlighting individual factors to consider when formulating a personalized care plan. The reports are color-coded—red, yellow, or green—to indicate risk levels and symptom severity, aiding providers in making informed recommendations and engaging in shared decision-making within the time constraints of the visit. Red reports are further evaluated to determine if referrals to collaborating specialists are necessary. This tool was launched with the inception of the program on August 2024, and its outcomes were evaluated after the first six months of use, focusing on its feasibility, the care experience, the categorization of the color-coded reports, and the number of specialist referrals generated. **Results:** 290 patients were seen in the comprehensive menopause program in 6 months. All 5 certified core menopause providers adopted the decision-support tool for their initial 30-minute patient consultations. The tool's implementation was deemed feasible and was reported to enhance the provider-patient experience. Providers agreed that the care delivered was more comprehensive and safer, attributing this to a more holistic understanding of the patient's health and risk factors prior to the consultation. This insight enabled them to tailor treatment recommendations more effectively and devote significant time to shared decision-making. The providers appreciated the streamlined access to program specialists and the collaborative nature of patient care. They identified the need for more dedicated clinical and software support to address technical issues and improve efficiency before and after visits as an area for improvement with the first-generation product. In total, 725 red reports (averaging 2.5 per patient), 551 yellow reports (averaging 1.9 per patient), and 411 green reports (averaging 1.42 per patient) were generated before the patients' visits. Additionally, 466 referrals (averaging 1.6 per patient) were made to collaborating specialists within the program, across various disciplines including sleep, neurology, neuropsychology, mental health, pelvic floor physical therapy, bone health, cancer genetics, women's cardiology, urogynecology, breast health, and integrative health. **Conclusion:** The technology-based decision support tool has proven to be a practical and positively received innovation for delivering comprehensive, individualized menopause care within the time constraints of a medical visit at an academic center. The reports generated facilitate collaboration with specialists, enhancing the quality of care for high-risk patients. This method represents a scalable innovative solution to meet the increasing demand for exceptional menopause care. The standardized process and technological integration offer a robust framework for conducting clinical research, both within the institution and in collaboration with other institutions.

Sources of Funding: None

P-106.

The relationship between serum levels of 25-hydroxyvitamin D levels and T-score values in bone mineral densitometry in postmenopausal patients of a private hospital in Mexico.

Maria F. Perez - Torres, Jessica A. Mariñelarena - Batista, Antonio Davila - Rivas, Grecia A. Villa - Cruz, Daniel H. Mendez - Lozano. Tec de Monterrey, San Pedro Garza García, Mexico

Objective: To analyze the correlation of vitamin D levels as well as the T-score value in patients with menopause to investigate whether there is a longitudinal relationship between these two values. **Design:** Cross-sectional, retrospective and observational study. Postmenopausal female patients who attended medical consultation during the period from March 2020 to December 2022 at the Zambrano Hellion Medical Center and who had measurement of serum levels of 25 hydroxy-vitamin D as well as bone densitometry as part of their medical evaluation were included in annual screening. Demographic characteristics such as age and pathological history were obtained, as well as serum vitamin D values and results of contemporary bone densitometry. Chi-square and Fisher's exact tests were used to compare categorical variables. Spearman correlation and Pearson analysis were performed to measure the strengths of association between two or more variables. A T score cut-off of -1 to -2.4 was used for the diagnosis of osteopenia and -2.5 or lower for the diagnosis of osteoporosis. **Results:** Information was collected from 272 patients, of which 137 met the selection criteria for the present study. These were women with a median (IQR) age of 54 (7) years. They were divided into 3 groups according to their lumbar and hip T-score results, 60 (43.8%) patients without alterations in the study, 67 (48.9%) patients with osteopenia and 10 (7.3%) patients with

osteoporosis were presented. None of them had previous treatment. To determine the existence of a difference between the levels of 25(OH)D for the 3 groups, the Kruskal-Wallis test was performed. A significant difference was found for the three groups, the group without alterations had a median (IQR) of 35.05 (25.77), for osteopenia of 28.12 (22.6) and for osteoporosis of 25.1 (10.83), p=0.028. Spearman correlation was performed to determine the relationship between the lumbar and hip T-score values, with age, years of postmenopause and vitamin D levels. A mean significant negative correlation was found between the lumbar and hip T-score for age (ρ=-0.338, $p<0.01$ and ρ=-0.209, $p<0.05$). **Conclusion:** It was found that there is a significant difference between vitamin D values for the T-score groups of healthy patients compared to the groups with osteopenia and osteoporosis. The existence of a correlation between the 25(OH)D values and the T-score could not be determined, but a significant moderate negative correlation was found for age and years of postmenopause. The null correlation between vitamin D levels and the T-score suggests that vitamin D levels are not directly related to bone mineral density in the population studied since other factors may be influencing this population.

Sources of Funding: None.

Difference in vitamin D levels

Variable	Normal densitometry n= 60 (Median [Interquartile range])	Osteopenia n= 67 (Median [Interquartile range])	Osteoporosis n= 10 (Median [Interquartile range])	p-value
Vitamin D levels (nmol/L)	35.05 (25.77)	28.12 (22.6)	25.1 (10.83)	0.028

Spearman correlation between the T-score values

Variables	Lumbar T-score	Hip T-score	Years of posmenopause	Vitamin D levels
Hip T-score	.560**	1	-.288**	0.089
Years of posmenopause	-.357**	-.288**	1	0.033
Vitamin D levels	0.043	0.089	0.033	1
Age	-.338**	-.209*	.717**	.195*

****The correlation is significant at the 0.01 level.**
***The correlation is significant at the 0.05 level.**

P-107.
Dyspaurenia as a symptom of UTI

Monica Pevida, medical student, Alberto Dominguez-Bali, Yanicka Shepherd, Sarah Mourtada. Miami Center for Obstetrics and Gynecology, Miami, FL

Objective: The abstract aims to highlight: The prevalence of dyspareunia as a symptom of UTI, especially among premenopausal and perimenopausal women, and its significance. The lack of prior literature discussing this association, attributing it to societal discomfort and inadequate medical education on sexual health. The urgent need for medical education reform to include comprehensive training on sexual health to improve patient care and outcomes. The successful response of premenopausal women to antibiotics to treat dyspaurenia and postmenopausal women to antiobiotics and/or topical vaginal estrogens. The abstract ultimately aims to draw attention to an overlooked yet clinically significant aspect of women's health and advocate for changes in medical education and clinical practice to address these issues effectively. **Design:** Prospective follow up of our patients with diagnosis of dyspaurenia or UTI since 2010 and their response to antiobitoics and/or local estrogens **Results:** Among a total of 19,661 patients observed over a 15-year period: **Premenopausal Patients:** UTI was diagnosed in 4962 patients (68.7% of premenopausal patients). Dyspareunia was reported as a symptom in 2261 cases (31.3% of premenopausal patients with UTI). Dyspaurenia was present as a symptom of UTI in 81.3% of premenopausal patients. Antibiotic treatment was prescribed to 72% of patients (4228 cases), with 7.3% (429 cases) receiving two antibiotics and 10.7% (628 cases) receiving a combination of two antibiotics and local estrogen. **Postmenopausal Patients:** UTI was diagnosed in 1118 patients (27% of postmenopausal patients). Dyspareunia was diagnosed in 3024 postmenopausal patients (73%) 33% of UTI patients had dyspaurenia as a symptom in postmenopausal patients. Antibiotic treatment was prescribed to 33.3% of patients (4142 cases), with 24% (1002 cases) receiving one antibiotic, 64% (2670 cases) receiving two antibiotics and local estrogen, and 11% (450 cases) receiving more than two antibiotics and local estrogen. **Postmenopausal Patients with Dyspareunia/GSM:** Out of 6493 postmenopausal patients experiencing dyspareunia and/or genitourinary symptoms of menopause (GSM), 94% (6103 patients) responded positively to treatment with estrogen and vaginal cream. 52.2% of postmenopausal women with dyspasurenia was secondary to genitourinary syndrome of menopause **Conclusion:** These findings underscore the significant prevalence of dyspareunia as a symptom of UTI, particularly in premenopausal women, and highlight the effectiveness of tailored treatment approaches involving antibiotics and hormonal therapies in managing these conditions among some premenopausal and most postmenopausal patients.

Sources of Funding: None

Premenopausal patients

Parameter	Number of Patients	Percentage (%)
Total premenopausal patients	7223	
Diagnosed with UTI	4962	68.7
Dyspaurenia as UTI symptom	2261	31.3

Postmenopausal patients

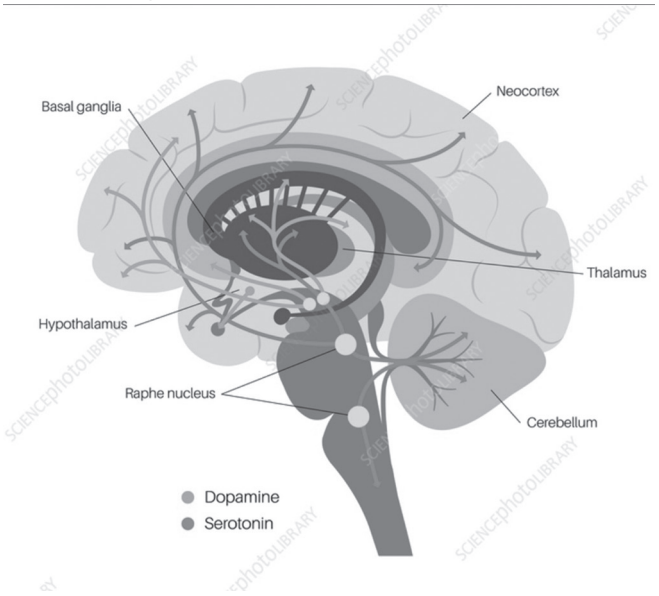
Parameter	Number of patients	Percentage (%)
Total menopausal patients	12438	
Diagnosed with UTI	1118	27
Dyspaurenia	3024	73

P-108.
Hypersexuality and SSRI use: Presentation of 2 cases

Monica Pevida, medical student, Alberto Dominguez-Bali, Sarah Mourtada, Yanicka Shepherd. Miami Center for Obstetrics and Gynecology, Miami, FL

Objective: Selective serotonin reuptake inhibitors (SSRIs), including fluoxetine, sertraline, and paroxetine, are commonly prescribed antidepressants known to cause sexual dysfunction in 30-80% of patients. However, hypersexuality as a potential side effect of SSRIs has been rarely reported. We are presenting two cases of hypersexuality in perimenopausal women associated with the use of SSRIs, specifically sertraline or fluoxetine combined with bupropion for psychiatric conditions. **Design:** Two perimenopausal women presenting with hypersexuality were evaluated and treated at our center. Treatment involved discontinuation of the offending SSRI and initiation of bupropion therapy. Both patients underwent couple and sex therapy interventions to address relationship dynamics and depressive symptoms. **Results:** In both cases, discontinuation of the SSRI in combination with bupropion therapy resulted in effective management of hypersexuality. Patient 1 experienced a reduction in hypersexuality within 2 to 4 weeks, with complete resolution achieved after 10 weeks of multidisciplinary therapy. Patient 2 responded more rapidly, with normalization of sexual activity within 4 weeks of treatment initiation. Couple and sex therapy significantly improved relationship dynamics and depressive symptoms in both cases. **Conclusion:** The emergence of hypersexuality with SSRI use, particularly when combined with bupropion, represents a clinically significant but underreported phenomenon. The underlying mechanisms of SSRI-induced sexual dysfunction involve serotonin and dopamine neurotransmitter pathways, potentially exacerbated by the addition of bupropion. Further research is needed to elucidate the synergistic effects of these medications and optimize therapeutic strategies for managing SSRI-related sexual side effects.

Sources of Funding: None



P-109.
Reproductive Aging: Discovery of Dynamic Transcriptional Profiles in Human Ovaries

Madison Ferris, Biomedical Engineering[2], Emma Lee[2], Almudena Veiga-Lopez[1], Beatriz Peñalver Bernabé[2,3]. [1]Department of Pathology, College of Medicine, University of Illinois Chicago, Chicago, IL; [2]Department of Biomedical Engineering, Colleges of Engineering and Medicine, University of Illinois Chicago, Chicago, IL; [3]Center for Bioinformatics and Quantitative Biology, University of Illinois Chicago, Chicago, IL

Objective: Menopause is associated higher risk of hypertension, cognition depletion, osteoporosis, and cardiovascular diseases. Current markers of menopause, such as the Anti-Müllerian Hormone (AMH), are indirect measurements of the total ovarian reserve. While AMH can accurately confirm when the final menstruation period has occurred, it cannot reliably predict the onset and/or duration of the menopause transition. This study aims to identify novel markers of ovarian aging by discovering ovarian biological processes that change throughout the reproductive life span. **Design:** We utilized publicly available bulk RNA-seq data from The Genotype-Tissue Expression database (v8), encompassing 179 ovarian samples from seven age ranges (20-29, 30-39, 40-49, 50-59, 60-69, and 70-79 years). We employed EdgeR for differential expression analysis to identify genes that significantly change with age and Gene Set Analysis (GSEA) to establish the sets of differentially expressed genes (DEGs) associated with molecular functions and biological processes. We then classified samples into three reproductive periods Pre-menopause transition (Pre-MT < 40), Menopause transition (MT, 41-59), and Post-menopause transition (Post-MT, 59-79) and used a machine learning approach, Random Forest, to determine the predictive capability of the ovarian dynamic transcriptional profiles of the reproductive period. **Results:** Our analysis identified 5,173 significant DEGs (p-value < 0.05 after false discovery rate correction)

across all age group comparisons. Notably, the enzyme carbonic anhydrase 4 (CA4), located within the endoplasmic reticulum where hormones are synthesized, exhibited a significant decrease across aging. We also observed an upregulation of apoptotic processes and protein misfolding when comparing menopausal individuals (60-69, 70-79) to those in the peak of fertility (20-29, 30-39). Additionally, menopausal individuals also displayed a reduction in transcripts associated with the MAPK pathway, crucial for ovulation, and lipid response pathways, including responses to estradiol, bile acids, and retinoic acid. Our random forest models could predict ovarian reproductive age with 85% accuracy. **Conclusion:** Our analyses provide valuable insights into potential mechanisms underlying ovarian aging and the dynamic transcriptional and enzymatic profiles associated with it. These findings are the first step towards our understanding of the complex mechanisms driving the menopausal phase, emphasizing the necessity for further research to accurately classify and delineate this critical transitional stage.
Sources of Funding: None

P-110.
Integrating a Menopause Clinic into a Primary Care Office Setting

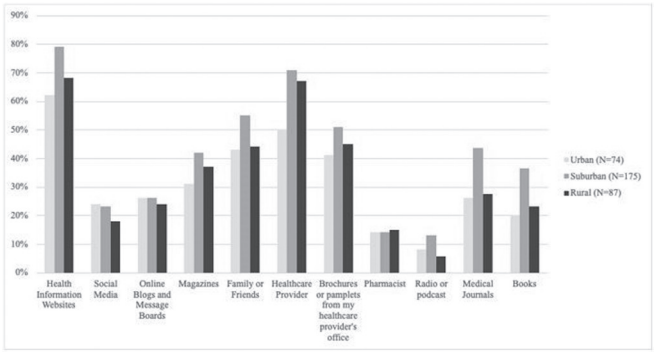
Jaclyn Piasta, MSN, WHNP-BC. Monarch Health, LLC, Marietta, GA

Objective: 1. Describe the necessity of integrating a menopause clinic into primary care settings. 2. Detail the structure and function of the integrated menopause clinic within a primary care office, including staffing, resources, and patient flow. 3. Present findings on the effectiveness of the integrated model in improving patient outcomes, such as symptom management, quality of life, and patient satisfaction. 4. Discuss provider satisfaction with the integrated model, including factors such as workload, training needs, and perceived benefits to patient care. 5. Analyze the cost-effectiveness of integrating a menopause clinic into primary care compared to traditional referral-based care models, considering both direct medical costs and indirect costs such as productivity loss. 6. Explore strategies for ensuring equitable access to menopause care within the integrated model, particularly for underserved populations or those with limited healthcare resources. 7. Identify potential enhancements to the integrated model to further improve patient outcomes and address evolving needs in menopause care within primary care settings. **Design:** This is a DNP project proposal that looked at the feasibility of incorporating a menopause clinic into a pre-existing primary care model. A systemic review and proposal **Results:** Findings suggest net losses within the first three years with net neutral by year four and net profits anticipated by year 5. **Conclusion:** The integration of a menopause clinic within a pre-existing primary care office underscores the significance of menopause in women's lives, detailing its physiological impact and the subsequent healthcare gaps it generates. With a vast number of women experiencing menopause-related symptoms, the inadequacies in care delivery become evident, with a significant portion left untreated. Additionally, the scarcity of healthcare professionals trained in menopause management exacerbates the problem. Financially, menopause-related healthcare costs for the individual have been shown to be substantial. The proposed clinic will improve patient care, reduce costs, and enhance overall clinic efficiency, utilizing metrics to measure effectiveness, including patient satisfaction, demographic data, and financial viability. Financial projections indicate steady revenue growth over two years, with eventual net profits anticipated by year five as the clinic achieves increased efficiency and patient volume.
Sources of Funding: None

P-111.
Menopause symptom burden and management across rural, suburban, and urban settings in a US Population

Erin R. Dwyer[1], Pauline Maki[2], Ronit Katz[1], Monica Mallampalli[3], Susan Reed[1]. [1]University of Washington, Seattle, WA; [2]University of Illinois at Chicago, Chicago, IL; [3]HealthyWomen, Middletown, NJ

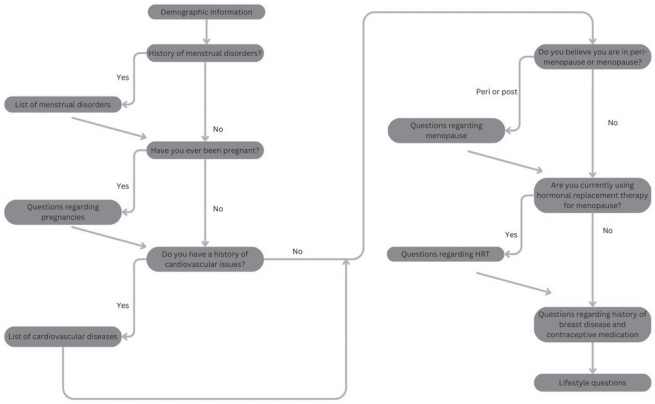
Objective: Compare menopause experience in rural, suburban, and urban-residing women **Design:** A 2019 online survey of U.S. females queried respondents on menopause symptoms, resources, and treatments. Those ≥ 45 years of age and in menopause transition or postmenopause were included in the analysis. Menopause transition and postmenopause subgroups were stratified by rural, suburban, and urban residence and age-weighted proportions for menopause symptoms and treatments were calculated and compared using chi square tests. **Results:** 1,181 respondents, 29% (N=336) menopause transition and 72% (N=845) postmenopause, were included. More prevalent symptoms in menopause transition rural residents were: brain fog (urban: 51%, suburban: 59%, rural: 70%, P-value=0.04), fatigue (urban: 51%, suburban: 65%, rural: 70%, P-value=0.04), muscle aches and pains (urban: 51%, suburban: 50%, rural: 74%, P-value<0.01), and panic attacks (urban: 15%, suburban: 22%, rural: 32%, P-value=0.03). More prevalent symptoms in postmenopause rural residents were: mood swings (urban: 18%, suburban: 14%, rural: 23%, P-value=0.02), urinary incontinence (urban: 19%, suburban: 14%, rural: 23%, P-value=0.02) and vaginal dryness (urban: 22%, suburban: 29%, rural: 37%, P-value=0.004). Vasomotor symptom prevalence was high (80% menopause transition, 20% PMP) but current menopause hormone therapy use was low (16% menopause transition, 11% postmenopause) and did not differ by residence, despite differences in menopausal resources used (Figure 1, Resources used for information on healthy aging by residential status in menopause transition). Among those in the menopausal transition, suburban and rural respondents were more likely to report use of health information websites compared to urban respondents (urban: 62%, suburban: 79%, rural: 68%, P-value=0.015), as wells as healthcare providers (urban: 50%, suburban: 71%, rural: 68%, P-value < 0.01). Additionally, suburban respondents were more likely to report use of medical journals (urban: 26%, suburban: 43%, rural: 28%, P-value < 0.01) and books (urban: 20%, suburban: 37%, rural: 23%, P-value=0.01). Among those in postmenopause, there was no statistical difference between groups. **Conclusion:** Rural women may experience greater burden of psychological and somatic menopause symptoms but not vasomotor symptoms. Overall low rates of menopause hormone therapy use suggest a need for education regarding hormone therapy, tailored to residential groups who rely on different resources on healthy aging.
Sources of Funding: Data collection was funded by educational grants from Amgen, Astellas, Pfizer, TherapeuticsMD and GCI Health. Data analysis was funded by the Department of Obstetrics and Gynecology, University of Washington.



P-112.
Understanding Common Pathways of Menopause Symptoms

Sasha Rieders, MS Machine Learning Engineering, Michael N. Liebman, PhD Chemistry. IPQ Analytics, Philadelphia, PA

Objective: Approximately 50% of all US women are age 40 or older, likely to be in perimenopause with menopause occuring at 51 years of age on average. Although these affect approximately half of a woman's life, this normal transition is poorly understood by clinicians and women, and individuals likely experience different journeys. This project provides the basis for identifying, quantifying, and enabling a better understanding of how menopause progresses using evidence-based methods. Understanding what may be common transition trajectories vs non-typical presentations should benefit both the individual and their clinician to provide better support and guidance. **Design:** We are using two complementary approaches with women both in the US and in Canada and with the inclusion of underserved populations. The study involves a voluntary, anonymous internet-based survey involving women in Delaware, in collaboration with Pretty Moody Foundation, and is intended to expand to a broader public health study. The survey will collect data on severity, timing, and treatment of symptoms; menstrual and reproductive history; and history of chronic disease, starting with menarche and extending through pregnancy(ies) to peri-menopause. To not restrict the data to the set of common symptoms, a parallel, mini-study will collect narratives from individuals, with minimum prompting, and apply natural language processing to identify both novel symptoms as well as perceptions of the individual, which may never be reported to the physician. In addition, collaboration with the American Heart Association will evaluate risk for post-menopausal cardiovascular disease, and in separate analyses, breast cancer. The results of these studies will be used to model how women progress from menarche through peri-menopause and menopause to identify potential common paths of symptoms and will both be published and serve as the basis for development of a much larger, population-based study. Additionally, the results will be incorporated into the existing Digital Twin model created to represent menopause (Modeling and Simulation of Pathways in Menopause, Dimitra Tsavachidou, MD, Michael N. Liebman, PhD, Journal of the American Medical Informatics Association Volume 9 Number 5 Sep / Oct 2002). **Results:** The study is in progress and results will be presented at the conference. **Conclusion:** The study is in progress and results will be presented at the conference.
Sources of Funding: None



P-113.

Radiofrequency Ablation of the Vaginal Canal for Genitourinary Syndrome of Menopause

Rodger W. Rothenberger, Medical Doctorate[1], Elaine Kopinga, NP[2], Jeffrey Dell, MD[3], mickey karram, MD[4]. [1]Female Pelvic Medicine and Reconstructive Surgery, University of Louisville, Cincinnati, OH; [2]California Center for Female Pelvic Health and Sexual Wellness, Corona Del Mar, CA; [3]Institute for Female Pelvic Medicine, Knoxville, TN; [4]Division of Female Pelvic Medicine and Reconstructive Surgery, The Christ Hospital, Cincinnati, OH

Objective: To determine the safety and efficacy of radiofrequency ablation via microneedling of the vaginal canal in reducing the symptoms of Genitourinary syndrome of menopause (GSM) and bladder dysfunction. **Design:** We conducted a multicenter prospective case series of women with GSM as confirmed by vaginal health index score (VHIS). Subjects received 3 treatments of radiofrequency microneedling approximately 4 weeks apart with the InMode MorpheusV applicator. The applicator contained 24 needles that delivered radiofrequency energy to a depth of 3mm, 2mm, or 1mm. The entire vaginal canal was treated at all 3 depths at every treatment session. All subjects were then followed by 3, 6, and 12 months. The primary-endpoint was VHIS at 6-months post-treatment. Secondary-endpoints included Visual Analog scale (VAS) pain score with procedures; Provider ease of use with each procedure; VHIS at 3 and 12 months; UDI-6, FSFI, SF-12, and PGI at 3, 6, and 12 months; and VAS scores associated with overall genitourinary pain, vaginal burning, dysuria, dyspareunia, and pruritis at 3, 6, and 12 months. **Results:** From 2021-2024 25 patients were enrolled with 21 to 23 patients were included in the various analyses due to missing data. Treatments had a low VAS pain score with mean VAS pain of 1.90 at Tx, 1.88 at Tx2, and 1.60 at Tx3, indicating low pain. Pain did not differ from procedure to procedure ($p = 0.77$). Ease of use did not differ from procedure to procedure ($p = 0.36$). Mean values were qualitatively high at 3.96 at Tx1, 4.29 at Tx2, and 4.12 at Tx3 (5 point scale with higher numbers indicating easier use). Regarding the five VAS outcomes, three had ANOVA testing that was statistically significant ($p < 0.05$), with the exception of VAS pruritis and VAS pain. Pairwise comparisons to baseline demonstrated significant improvement at 3 months in VAS burning ($p = 0.02$); 3 months for dysuria ($p = 0.04$); and 3, 6, and 12 months for VAS dyspareunia (3 month $p = 0.01$, 6 month $p = 0.001$, 12 month $p = 0.01$). All other pairwise comparisons were not statistically significant. VHIS improved significantly from baseline to 3 months (11.7+/-1.7 vs 17.4+/-3.5, $p < 0.001$) with continued significant improvement with respect to baseline at 6 and 12 months (18.0+/-3.3 and 18.8+/-3.1) indicating sustained improvement in GSM symptoms over 12 months. All VHIS subscales also demonstrated similar significant improvements at 3, 6, and 12 months. An improvement in UDI-6 data was seen from baseline to 3 months (36.4+/-19.0 vs 22.8+/-17.2, $p = 0.001$); these improvements were also sustained at 6 months (23.5+/-16.8, $p = 0.01$) and 12 months (26.5+/-13.5, $p = 0.20$). At baseline mean UDI-6 was >33.33 with 3, 6, and 12 month data less than this threshold, indicating resolved distress. An improvement in FSFI was also seen from baseline to 3 months (18.1+/-9.0 vs 23.9+/-7.7, $p = 0.003$) and sustained at 6 months (22.9+/-8.35, $p = 0.01$) but with waning efficacy at 12 months (20.0+/-8.4, $p = 1.00$). ANOVA testing for the FSFI was statistically significant ($p = 0.001$). Pairwise comparisons demonstrated that at 3 and 6 months FSFI was significantly improved from baseline. However, by 12 months, FSFI was no longer significantly different from baseline. A survey measuring general physical and mental health (SF-12) was completed by patients. Neither the SF-12 physical or mental outcome results were statistically significant. Finally, Satisfaction was measured by a PGI at 3, 6, and 12 months. At each period, satisfaction was unchanged, ($p = 0.36$). Mean satisfaction was high at 3.91+/-0.9 for baseline, 3.86+/-0.8 for 3 months, and 3.64+/-1.0 for 12 months. No adverse events were encountered by any subject during this study. **Conclusion:** Radiofrequency microneedling as delivered by the MorpheusV applicator is safe. Data suggests that Radiofrequency ablation up to 3mm seems to be an effective therapy for GSM, showing to 12 months. An added advantage may be a significant improvement in bladder dysfunction as measured by UDI-6 and sexual dysfunction as measured by FSFI.

Sources of Funding: Foundation for Female Health Awareness

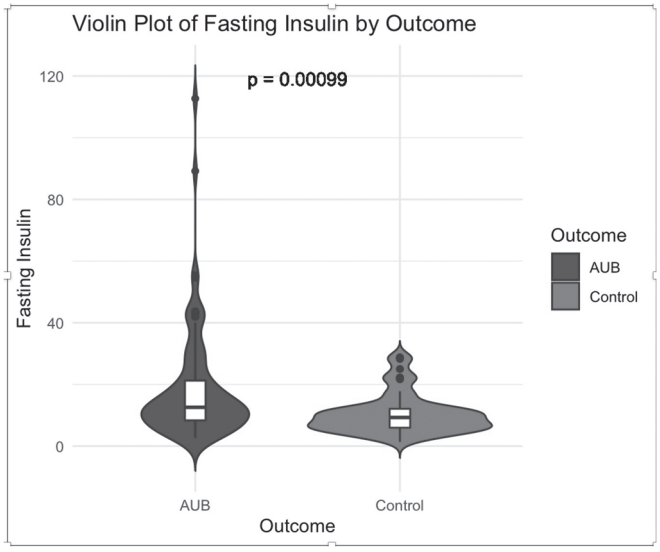
P-114.

The Uterus is an End Organ: insulin resistance and cardiovascular disease risk factors are associated with abnormal uterine bleeding.

Andrea C. Salcedo, DO, MPH. Department of Gynecology and Obstetrics, Loma Linda University School of Medicine, Loma Linda, CA

Objective: The uterus can be considered a recipient of cardiovascular disease inflammation, as other end organs. It is well documented insulin resistance and cardiovascular disease risk factors are associated with kidney disease, heart disease, and NAFLD. As such, the investigators evaluated the association of insulin resistance and metabolic syndrome risk factors, with the most common causes of abnormal uterine bleeding (AUB). Treatment of AUB is largely symptom-based and focused on medical and surgical management. It is well established PCOS is associated with insulin resistance, yet these associations between other causes of AUB, such as uterine fibroids and endometrial polyps, have not been investigated. The purpose of this study is to evaluate the presence of hyperinsulinemia and cardiovascular disease risk factors among women with abnormal uterine bleeding. **Design:** This prospective, single institution, outpatient case control study investigated the association of elevated fasting insulin level and cardiovascular disease risk factors with abnormal uterine bleeding. **Results:** Among the 116 cases and 86 controls, elevated fasting insulin level was significantly associated with abnormal uterine bleeding among reproductive aged women ($p<0.001$). Fasting insulin was also significantly elevated between controls and cases with uterine fibroids ($p<0.005$). Low HDL was also significantly associated with abnormal uterine bleeding ($p<0.01$). **Conclusion:** The findings of this study can help women understand the metabolic associations of common causes of abnormal uterine bleeding. It can potentially lead to the use of lifestyle approaches in the first line treatment and prevention of abnormal uterine bleeding.

Sources of Funding: none



P-115.

In Their Own Words: Women Need Access to Specialized Menopause Health Professionals

Jennifer Sauer, Master of Arts, Laura Mehegan, M.A. Research, AARP, Washington, DC

Objective: Gauge the impact of menopause symptoms in the workplace and treatments women use to manage symptoms across race and ethnicity. **Design:** Data are drawn from a 3-part study: 1) focus groups; 2) a nationally representative survey of 1,510 U.S. women ages 35 and older with racial/ethnic oversamples of Black/African American (B/AA), Hispanic/Latino (H/L), and Asian American, Native Hawaiian, Pacific Islander women (AANHPI); and 3) a nationally representative survey of 403 U.S employers. **Results:** Across the racial/ethnic groups, women experience an average of 5.1 out of 14 menopausal symptoms tested in the survey at any given time. Among the top four symptoms, Black/African American women experience **hot flashes** (B/AA: 71%; W: 63%; H/L: 60%; AANHPI: 61%) and **night sweats** (B/AA: 61%; W: 53%; H/L: 51%; AANHPI: 43%) more than other racial/ethnic groups. More Hispanic/Latino women than other racial/ethnic groups report **mood or emotional swings** (H/L: 55%; W: 49%; B/AA: 44%; AANHPI: 36%) like anxiety or depression, and **fatigue** (H/L: 52%; W: 47%; B/AA: 46%; AANHPI: 39%). In their words: "*heavy periods…created a problem…doing normal things…just way too much." And: "Intimacy…my drive…[because of menopause] I didn't have a drive anymore…destroying intimacy [affects]…relationships"*. For half (49%) of all women, menopause symptoms have a negative impact *day-to-day life* with significantly more Hispanic/Latino women feeling this way than White or Black/African American women (very/somewhat negative: 63%, 54%, 51%, respectively). Across race/ethnicity, four in ten (39%) female workers say menopause symptoms negatively impact *work life*. Sixty-two percent of women say mood/emotional symptoms interfere with their ability to do their job, and at least half say hot flashes or night sweats (56%), or headaches, joint or muscle pain (50%) interfere. Over a third (38%) say forgetfulness or staying focused interferes with work. In their words: "*the sleeplessness… affected ability to…focus…[like before] menopause"*; and "*was getting brain fog. I actually went part-time because…'I can't do this." Non*-medical approaches to symptom relief like nutritional or herbal supplements (45%), diet changes (29%), or new exercise routines (28%) are more commonly turned to than medical treatments like anti-depressants (25%), thyroid medication (15%), or hormone replacement therapy (HRT) (14%). On average, women try 2.1 nonmedical treatments and 2.5 medical treatments at any given time. Relief preferences differ by race/ethnicity. More White women than other racial/ethnic groups take **psychotropic medications** (W: 30%; B/AA: 24%; H/L: 21%; AANHPI: 14%) and Black/African American, Hispanic/Latino, and Asian American, Native Hawaiian, Pacific Islander women, more than White women, report taking **vitamins and supplements** (B/AA: 57%; H/L: 57%; AANHPI: 57%; W: 47%). Use of thyroid medication or HRT is consistent across racial/ethnic groups. And, 72 percent of all women would like HRT covered by insurance and 68 percent want alternative treatments covered. Across race and ethnicity, only 12 percent of women say their employer offers access to menopause health professionals, and 70 percent *want* their employer to offer this benefit. Many focus group participants express frustration with healthcare providers'

understanding or treatment of menopause. In their words: "*Not helpful...do your own research…[no] support…get it elsewhere.";* and "*My primary care, a man…wonderful doctor…doesn't get menopause."* Participants who *were* satisfied with their provider experience say it's because the doctor listened to them. Lastly, results show women think that U.S. policymakers (Agree: 64%) and that employers (Agree 54%) need to ensure access to quality, personalized menopause care and treatment, including hormone replacement therapy. **Conclusion:** Four key insights emerged: 1) menopause symptoms vary by race/ethnicity while the average number of symptoms experienced does not; 2) the negative impact of menopause symptoms on day-to-day life and work life varies by race/ethnicity; 3) relief preferences vary by race/ethnicity, but across the groups, women want access to menopause health professionals and insurance coverage for HRT and other treatments; and 4) U.S. policymakers need to do more to ensure all women can access personalized menopause care and treatment.
Sources of Funding: None

P-116.

Design of NIRVANA: a phase 2 pilot trial to assess the efficacy of elinzanetant for the treatment of sleep disturbances associated with menopause

Gary K. Zammit[1,2], Katrin Roth[3], Claudia Haberland[3], Cecilia Caetano, MD[4], Christian Seitz[3,5], Frank Kramer[6], Susanne Parke[3], Hoi-Shen Radcliffe[7], Lineke Zuurman[4]. [1]Clinilabs Drug Development Corporation, Eatontown, NJ; [2]Icahn School of Medicine at Mount Sinai, New York, NY; [3]Bayer AG, Berlin, Germany; [4]Bayer CC AG, Basel, Switzerland; [5]Charitié Universitätsmedizin, Berlin, Germany; [6]Bayer AG, Wuppertal, Germany; [7]Bayer PLC, Reading, United Kingdom

Objective: Sleep disturbances are one of the most common and bothersome symptoms that occur during menopause and can affect women's quality of life. Current treatment options are suboptimal due to efficacy, safety or tolerability concerns with long-term use. Elinzanetant is a dual neurokinin (NK-1 and NK-3) receptor antagonist which has shown efficacy in reducing the frequency and severity of vasomotor symptoms as well as improving patient-reported outcomes (PROs) of sleep disturbances and menopause-related quality of life in postmenopausal women. SWITCH-1, a Phase 2b study, showed statistically significant improvements with elinzanetant compared to placebo in global Pittsburgh Sleep Quality Index (PSQI) and Insomnia Severity Index (ISI) total score. Furthermore, two Phase 3 studies, OASIS 1 and OASIS 2, showed statistically significant improvements in sleep disturbances (measured using the Patient Reported Outcomes Measurement Information System Sleep Disturbance Short Form 8b [PROMIS SD SF 8b]) with elinzanetant compared to placebo. Notably, in both SWITCH and OASIS, women did not need to have sleep disturbances to enter the studies. The NIRVANA study will explore the efficacy of elinzanetant for the treatment of sleep disturbances associated with menopause, specifically in women with sleep disturbances at baseline assessed via polysomnography (PSG), the current gold standard for the objective measurement of sleep. Measurement of wakefulness after sleep onset (WASO) using PSG was selected to assess the primary endpoint. **Design:** NIRVANA is a Phase 2 multi-center, multi-country, double-blind, randomized, parallel-group, placebo-controlled, pilot intervention study in women with sleep disturbances associated with menopause. The study will include postmenopausal women between 40–65 years of age, who have a self-reported history of sleep disturbances associated with menopause characterized by waking up at night and/or poor quality of sleep and a WASO of 30 minutes or more as measured by PSG. The main aim of the study is to generate objective data regarding the efficacy of elinzanetant 120 mg for the treatment of sleep disturbances associated with the menopause as determined by PSG; subjective data will also be generated using PROs. In addition, sleep quality at home will be assessed throughout the course of the study with a home sleep monitor in an exploratory fashion. The total study duration is approximately 22 weeks (plus a potential washout period prior to screening) including a 4–6 week screening period, 12-week treatment period and, 4-week follow-up period. A total of five study visits are planned. Approximately 78 participants are planned to be randomized in a 1:1 ratio to receive either 120 mg of elinzanetant or matching placebo orally, once daily, for 12 weeks. **Results:** PSG assessments will be performed on 2 consecutive nights during screening, at Week 4, and at Week 12. The primary efficacy endpoint is the change from baseline in WASO at Week 4 as measured by PSG. The baseline and Week 4 WASO values will be the mean value of 2 consecutive nights at screening and Week 4, respectively. The secondary endpoints are change from baseline in WASO at Week 12 (derived as per the primary endpoint), change from baseline in sleep efficiency at Weeks 4 and 12 (measured by PSG), change from baseline in PROMIS SD SF 8b total T-score at Weeks 4 and 12, and change from baseline in the ISI total score at Weeks 4 and 12. Adverse events will be reported throughout the study to evaluate the safety of elinzanetant 120 mg. **Conclusion:** NIRVANA will further investigate the efficacy and safety of elinzanetant on sleep disturbances associated with the menopause using objective and patient-reported measures.
Sources of Funding: This study was sponsored by Bayer CC AG, Basel, Switzerland

P-117.

Clinically meaningful improvements in vasomotor symptoms, sleep and quality of life of postmenopausal women: thresholds derived from OASIS-2 data

Andrew Trigg[1], Christoph Gerlinger[2,3], Christian Seitz[4,5], Claudia Haberland[6]. [1]Medical Affairs Statistics, Bayer plc, Reading, United Kingdom; [2]Statistics and Data Insights, Bayer AG, Berlin, Germany; [3]Gynecology, Obstetrics and Reproductive Medicine, University Medical School of Saarland, Homburg/Saar, Germany; [4]Clinical Development and Operations, Bayer AG, Berlin, Germany; [5]Institute of Clinical Pharmacology and Toxicology, Charité, Berlin, Germany; [6]Global Market Access, Bayer AG, Berlin, Germany

Objective: Clinical studies for novel treatments of vasomotor symptoms (VMS) are reliant on patient-reported outcome measures. The resulting scores of such measures require thresholds for interpreting clinically meaningful improvements over time, to complement evidence of statistical significance. Elinzanetant is a novel non-hormonal treatment for VMS. In two recent pivotal studies (OASIS 1 [NCT05042362] and 2 [NCT05099159]) all primary and key secondary endpoints showed superiority vs. placebo: mean changes in frequency and severity of moderate-to-severe vasomotor symptoms from baseline to weeks 4 and 12 as assessed by the Hot Flash Daily Diary [HFDD]), mean change in Patient-Reported Outcomes Measurement Information System Sleep Disturbance Short Form (PROMIS SD SF) 8b total T-score and Menopause-specific Quality-Of-Life (MENQOL) Total Score from baseline to week 12. **Design:** Data from 400 participants in the OASIS-2 study randomised to elinzanetant or placebo in an initial 12-week period were pooled to estimate thresholds for a meaningful within-individual improvement in HFDD Frequency and Severity of moderate to severe VMS weekly average scores, PROMIS SD SF 8b total T-Score, and MENQOL Total Score. Anchor-based analyses for change from Baseline to Week 4 and 12, using Patient Global Impression of Severity (PGI-S) and Change (PGI-C) instruments were conducted to contextualise meaningful changes in health. Each PGI-S and PGI-C comprised three questions related to VMS frequency, VMS severity and sleep. Correlations were used to judge the appropriateness of the anchor measures ($r \geq 0.3$ deemed acceptable). Meaningful change thresholds were estimated using logistic regression and discriminant analysis, then triangulated using a correlation-weighted average. Both 'minimally important' and larger 'much improved' thresholds were estimated. In addition, the degree of measurement error around within-individual score changes was estimated by the minimally detectable change at 90% confidence (MDC90). Cumulative density functions provided further support for the threshold estimates. **Results:** The PGI-S and PGI-C questions were deemed suitable anchor measures, as evidenced by correlations with the target scores between 0.330 and 0.702. Triangulation for the HFDD frequency weekly average score yielded weighted averages of -5.42 (95% CI -5.61, -5.22) and -7.24 (95% CI -8.42, -6.05) representing 'minimally important' and 'much improved' thresholds, respectively. Further triangulated thresholds are provided in Table 1, which were comparable in magnitude at week 4 and 12. The MDC90 values were below the 'minimally important' thresholds for HFDD Frequency, HFDD Severity and PROMIS SD SF 8b T-Score, indicating that these scores possess high precision to detect within-individual improvements. **Conclusion:** Robust 'minimally important' and 'much improved' thresholds for a meaningful within-individual improvement have been estimated, enabling greater understanding of the clinical importance of results in VMS clinical studies. These thresholds build upon findings from literature and can be applied in responder analyses to supplement statistical hypothesis testing of primary and secondary endpoints.
Sources of Funding: This study was sponsored by Bayer.

Table 1: Triangulated anchor-based thresholds and MDC90 values

Score	Visit	Minimally important threshold (95% CIs)	Much improved threshold (95% CIs)	MDC90
HFDD Frequency	Week 4	-4.96 (-5.66; -4.26)	-7.51 (-8.35; -6.67)	4.41
	Week 12	-5.42 (-5.61; -5.22)	-7.24 (-8.42; -6.05)	
HFDD Severity	Week 4	-0.55 (-0.65; -0.44)	-0.80 (-0.83; -0.76)	0.18
	Week 12	-0.59 (-0.71; -0.48)	-0.92 (-0.97; -0.88)	
PROMIS SD SF 8b total T-Score	Week 4	-6.09 (-6.88; -5.30)	-10.12 (-10.73; -9.51)	5.07
	Week 12	-6.98 (-8.29; -5.66)	-9.82 (-10.64; -8.99)	
MENQOL Total Score	Week 4	-0.82 (-0.95; -0.69)	-1.27 (-1.35; -1.19)	1.09
	Week 12	-0.94 (-1.08; -0.79)	-1.23 (-1.33; -1.13)	

P-118.

Hot Flashes at Night and Night Sweat Duration in relation to Sleep Quality

Sofiya Shreyer, MA[1], Daniel E. Brown[2], Sarah Witkowski[3], Lynnette L. Sievert, PhD[1]. [1]Anthropology, University of Massachusetts Amherst, Belchertown, MA; [2]Anthropology, University of Hawaii, Hilo, HI; [3]Exercise & Sport Science, Smith College, Northampton, MA

Objective: Hot flashes (HF) and night sweats (NS) are common and bothersome symptoms during the menopausal transition. Sleep disruptions are also common during menopause, though studies examining the relationship between HF, NS, and sleep have produced mixed results. Additionally, HF and NS are typically assessed as one symptom, rather than two distinct phenomena. In this study, we explore if objectively measured HF and NS during sleep impact sleep duration, wake after sleep onset (WASO), and sleep

quality. We hypothesize that longer duration of NS, longer duration of HF at night, and HF count at night will all be associated with shorter sleep duration, more WASO, and lower sleep quality. **Design:** Our sample was drawn from a larger study of 274 women aged 45-55 living in western Massachusetts. Data were collected during the colder months (October-April). In this study, 270 women were instructed to wear Biolog UFI Monitors for vasomotor symptom assessment and ActiGraph wGT3X monitors for estimation of physical activity for 24 hours. Participants were interviewed to collect information on demographics, self-reported health, and menstrual history. Height and weight were measured to compute BMI (kg/m^2). A subset of participants (n=120) was asked to fill out the Pittsburgh Sleep Quality Index (PSQI). HF were scored with conventional criteria (a rise of at least 2 micromhos in 30 seconds). Such criteria for scoring NS do not exist, so NS start and end times were determined by observing a rise in sweating above baseline that was maintained for at least 15 minutes. The GGIR package in R was used to obtain sleep onset and waking times. Linear models were performed in R using the lm function with total sleep duration (in hours), WASO (in hours), and the PSQI global index as outcome variables. Predictor variables for each model included HF number (total # of HF during sleep time) and HF duration (total duration of sweating from HF during sleep time), NS duration (total duration of sweating from NS during sleep time), menopausal status, financial comfort, and BMI. **Results:** Sixty participants completed the PSQI survey, had a full night's monitoring with both the Biolog and Actigraph monitors, and were observed to have either HF at night, NS, or both. Among these participants, average sleep duration was 7 hours and 38 mins (± 114 mins). Participants had an average of 1.7 HF during the night (8.5 minutes per night ± 14.6). Total NS duration averaged 113 minutes per night (±110). The average global PSQI score was 7.5 (± 4.11), and average WASO was 1 hour and 18 minutes (± 52 minutes). Sleep duration and NS duration were positively associated (p=0.03) after adjusting for covariates (menopause status, financial comfort, and BMI). In linear models, HF at night and NS were not significantly related to WASO or PSQI global scores. **Conclusion:** Understanding how hot flashes (HF) and night sweats (NS) influence sleep is crucial for understanding their overall impact on health. Our study found that objectively measured HF and NS were not significantly disruptive to sleep quality and duration in our population, contrary to our expectations. This suggests that relying solely on objective measures may not fully capture the nighttime experience of HF and NS. Previous research has shown that monitor-recorded signal amplitudes may not consistently reflect the severity of vasomotor symptoms, meaning high levels of sweating detected may not always indicate a bothersome event. Without complete subjective data during the night (because of sleeping), it's challenging to pinpoint which HF and NS events impact sleep. We did observe that longer NS periods were linked to longer sleep durations, possibly due to increased observation time rather than a causal relationship. Incorporating electroencephalogram (EEG) measures in future studies can enhance sleep parameter accuracy. The absence of complete self-reported HF and NS assessment may limit our ability to capture symptoms that are sufficiently bothersome to cause awakenings.
Sources of Funding: NSF BCS-1848330

P-119.
Clinical evaluation of the efficacy and safety of Amberen® and Smart-B® Complex in perimenopause relief

Lee P. Shulman, MD, PhD, Professor[1], Lauren Green, BS[2], Vera Kachko, MD/PhD[2], Irina V. Kuznetsova, MD, PhD[3,4], Yulia B. Uspenskaya, MD/PhD[5], Denis I. Denis Burchakov, MD[6]. [1]Department of Obstetrics and Gynecology, Feinberg School of Medicine of Northwestern University, Chicago, IL; [2]Medical Affairs, Alliance Pharmaceuticals Ltd, Chippenham, United Kingdom; [3]International Association of Gynecologists, Endocrinologists and Therapists, Moscow, Russian Federation; [4]Vitbiomed medical center, Moscow, Russian Federation; [5]Medsanchast No 14 LLC, Moscow, Russian Federation; [6]NOCHU DPO "Higher School of Medicine", Moscow, Russian Federation

Objective: The aim of this study was to evaluate the efficacy and safety of Amberen® (a succinate-based non-hormonal supplement) combined with a Smart-B® Complex (vitamin B) on perimenopause symptom relief. **Design:** 105 women, ≤ 50 years old, with mild to moderate climacteric syndrome in perimenopause completed the randomized, double-blind, placebo-controlled, comparative, prospective study. Participants were divided into either the investigational (IG) (n=52) or placebo group (PG) (n=53) for 90-days, followed by a 90-day observational period. Assessment was done at the start of the trial and at days 30, 60, 90 and 180. **Results:** Primary and secondary outcomes were changes in the vasomotor, psycho-somatic and psychological dysfunction determined by the Greene Climacteric Scale (GCS), State-Trait Anxiety Inventory (STAI), Hospital Anxiety and Depression Scale (HADS) and Well-being, Activity, Mood questionnaire (WAM). Comparative analysis showed a statistically significant improvement between treatment groups for most GCS symptoms at day 180, such as sleep, fatigue, loss of interest in sex, hot flashes and night sweats (Table). There was a statistically significant improvement in STAI parameters from day 30 compared to the placebo group: situational (*p=0.042*), trait (*p=0.026*) and actual anxiety (*p=0.0242*). HADS parameters of anxiety and depression decreased by day 60 with a statistically significant difference between treatment groups (*p=0.000* for both). The IG had a statistically significant increase in WAM parameters with activity (*p=0.000*) and wellbeing (*p=0.000*) increasing from day 60 and mood (*p=0.042*) from day 90. The study also evaluated plasma leptin levels, body weight, BMI, hip and waist circumferences and hormonal changes. Subgroup analysis demonstrated a significant decrease in the mean leptin concentration at day 90 between the IG (17.7ng/ml) and PG (23.4ng/ml) *(p=0.011)*. At day 180, there were no significant differences between the mean body weight of the treatment groups *(p=0.572)*, BMI (*p=0.555)*, hip circumference (*p=0.290)* or waist circumference (*p=0.497)*, however, there was a decreasing trend in the IG. Statistically significant improvement demonstrated in the IG with an increase in mean estradiol levels from 88.3 pg/ml (day 0) to 126.2 pg/ml (day 180) compared to a decrease from 99.6 pg/ml to 35.7 pg/ml in the PG, *p=0.708* and *0.000*, respectively. Mean FSH levels decreased from 29.6 mIU/ml to 14.9 mIU/ml between day 0 and 180 compared to an increase in the PG, *p=0.741* and *0.000*. The same trend was observed for LH levels, mean LH levels decreased from 23.0 mIU/ml to 10.7 mIU/ml compared to an increase in the PG, *p=0.471* and *0.000*. Subgroup analysis showed that during the course of the trial a total of 37 subjects resumed their menstrual cycle on day 180. No serious or life-threatening adverse events or side effects were registered during the trial, vital signs were monitored and showed no differences between IG and PG. **Conclusion:** The results of the trial supports the safe use of the succinate-based non-hormonal supplement with a vitamin B complex to improve vasomotor, psycho-somatic and psychological symptoms of climacteric symptoms in perimenopausal women. ClinicalTrials.gov Identifier: NCT03897738.
Sources of Funding: Biogix Inc

Comparative analysis of GSC symptoms where symptom experience is ranked 'Not at all' between IG and PG on Day 180.

Symptom	IG %(n)	PG %(n)	ρ
Feeling tense or nervous	51.9 (27)	11.3 (6)	0.00
Difficulty Sleeping	69.2 (36)	7.6 (4)	0.00
Sadness or depression	73.1 (38)	22.6 (12)	0.00
Irritability	61.5 (32)	1.9 (1)	0.00
Dizziness or fainting	78.8 (41)	56.6 (30)	0.05
Headaches	65.4 (34)	13.2 (7)	0.00
Muscle and joint pain	50.0 (26)	35.8 (19)	0.01
Hot flashes	73.1 (38)	3.8 (2)	0.00
Night sweats	80.8 (42)	3.8 (2)	0.00
Lack of sex drive	65.4 (34)	0 (0)	0.00

P-120.
Hot flash frequency across different climates

Lynnette L. Sievert, PhD[1], Daniel E. Brown[2], Linda M. Gerber[3], Laura Huicochea-Gómez[4], Diana Cahuich-Campos[4], Carla Obermeyer[7], Sofiya Shreyer[1], Maruška Vidovič,[5], Gillian R. Bentley[6]. [1]University of Massachusetts Amherst, Amherst, MA; [2]UH Hilo, Hilo, HI; [3]Weill Cornell Medicine, New York City, NY; [4]El Colegio de la Frontera Sur Unidad Campeche, Campeche, Mexico; [5]Institute of Public Health, Ljubljana, Slovenia; [6]Durham University, Durham, United Kingdom; [7]American University of Beirut, Beirut, Lebanon

Objective: Our previous analysis of hot flash (HF) frequency in 2005, drawn from 54 published studies, showed that women in warmer climates reported fewer HFs and more HFs with increasing seasonality. We hypothesized that exposure to cold may set climate-specific parameters on the thermoneutral zone. In this earlier study, HFs were measured in various ways (including "ever" having had HFs). Climate variables were from 2005, regardless of when the HF study was carried out, and we could not control for menopausal status or body mass index (BMI). The purpose of the present study was to repeat the 2005 analyses using different, original data from 15 cross-sectional studies of menopause with more comparable HF measurements, with high and low temperatures from the hottest and coldest months during each year of HF data collection, and with adjustment for menopausal status and BMI. **Design:** Data were drawn from a merged dataset of 15 original studies of menopause (n=7106) carried out in 10 countries from 1989 to 2023; 5763 participants were between the ages of 40 and 60, and studies spanned 1 to 5 years. HFs were self-reported as occurring during the past two weeks (11 studies) or past four weeks (4 studies). HFs were coded as yes/no; menopause status (pre-, peri-, or post) was based on SWAN+10 categories; BMI was available for 13 studies; and residence was coded as city, town, or rural. Cities included Campeche and Puebla, Mexico; Asunción, Paraguay; Sylhet, Bangladesh; London, UK; Madrid, Spain; Beirut, Lebanon; Rabat, Morocco; and Doha, Qatar. US studies took place in smaller communities in MA, NY, and HI. Rural sites were in Mexico and Slovenia. Historical temperatures were drawn from *weatherspark.com* for the high and low temperatures in the hottest and coldest months of each year during the study periods. Low temperatures during the cold months were subtracted from high temperatures during the hot months for a measure of seasonality. Separate logistic regressions were used to examine the relationship between HFs (yes/no) and the high temperature of the hottest month, low temperature of the coldest month, measure of seasonality, and latitude. Each model was adjusted for menopausal status, BMI, residence (city, town, rural), and month of data collection. **Results:** After adjusting for covariates, the low temperature of the coldest month at the time of the study was negatively associated with likelihood of HFs (OR 0.960, 95% CI 0.954-0.967). Our measure of seasonality was positively associated with likelihood of HFs (OR 1.061, 95% CI 1.053-1.069). In contrast to our earlier research, the high temperature of the hottest month at the time of the study was positively associated with likelihood of HFs (OR 1.055, 95% CI 1.039-1.071). Latitude was not associated with the likelihood of HFs. **Conclusion:** The results confirm our earlier findings that women were less likely to report HFs in climates with warmer temperatures during the coldest month, and more likely to report HFs in more seasonal climates. This finding persisted after adjusting for menopausal status, BMI, residence, and month of study. We could not, however, control for use of air conditioning, central heating, or winter clothing. In light of the hypothesis that the thermoneutral zone may be climate-specific, future analyses will give special attention to migrants from hot to cold climates (Bangladesh to London) and from cold to hot climates (northeast US to Hilo, Hawaii).
Sources of Funding: NSF 9805299; NSF SBR-9600721; NIH/NIA 5R01-AGI7578-03; NIH/MBRS S06 GM08073-33; NSF 0548393; NSF BCS-1156368; NSF BCS-1848330; Qatar National Research Fund.

P-121.

Efficacy and Long-term Safety of Elinzanetant for the Treatment of VMS Associated with Menopause: A Phase 3 Randomized Trial (OASIS 3)

Nick Panay, FRCOG[1], Hadine Joffe, MD, MSc[2], Pauline Maki, PhD[3], Rossella E. Nappi, MD, PhD[4,5], JoAnn Pinkerton, MD[6], James Simon, MD[7], Claudio Soares, MD, PhD[9], Rebecca Thurston, PhD[8], Maja Francuski, MD[10], Cecilia Caetano, MD[11], Claudia Haberland, PhD[10], Nazanin Haseli Mashhadi, MSc Statistics[12], Kaisa Laapas, MSc Statistics[13], Susanne Parke, MD[10], Christian Seitz, MD[10], Lineke Zuurman, MD, PhD[11]. [1]Queen Charlotte's & Chelsea Hospital, Imperial College London, London, United Kingdom; [2]Brigham and Women's Hospital, Harvard Medical School, Boston, MA; [3]University of Illinois at Chicago, Chicago, IL; [4]University of Pavia, Pavia, Italy; [5]IRCCS San Matteo Foundation, Pavia, Italy; [6]University of Virginia Health, Charlottesville, VA; [7]George Washington University, IntimMedicine Specialists, Washington, DC; [8]University of Pittsburgh School of Medicine, Pittsburgh, PA; [9]Queen's University School of Medicine, Kingston, ON, Canada; [10]Bayer AG, Berlin, Germany; [11]Bayer CC AG, Basel, Switzerland; [12]Bayer plc, Reading, United Kingdom; [13]Bayer Oy, Espoo, Finland

Objective: Vasomotor symptoms (VMS) are bothersome menopausal symptoms that adversely impact women's daily lives. There is a need for additional safe and effective non-hormonal treatments for VMS to broaden treatment choices for women. The OASIS 3 Phase 3 randomized clinical trial aimed to evaluate the efficacy and long-term safety of elinzanetant (EZN) in postmenopausal women with moderate-to-severe VMS. **Design:** Naturally or surgically postmenopausal women aged 40–65 years experiencing any moderate-to-severe VMS were randomized 1:1 to receive EZN 120 mg or matching placebo (PBO) for 52 weeks. The primary efficacy endpoint was mean change in moderate-to-severe VMS frequency from baseline to week 12. Secondary endpoints were mean changes from baseline in PROMIS sleep disturbance short form (SD SF) 8b total T-score and Menopause-specific quality of life (MENQOL) total score over time. Safety assessments included treatment-emergent adverse events (TEAEs), endometrial biopsies, bone mineral density (BMD; femoral neck, hip, and lumbar spine), weight, and laboratory parameters. A liver safety monitoring board (LSMB) assessed cases meeting close liver observation (CLO) criteria in a blinded fashion. The primary endpoint was analyzed using a mixed model with repeated measures. All other analyses were descriptive. **Results:** At baseline, women receiving EZN (n=313) and PBO (n=315) were experiencing a mean (standard deviation [SD]) of 6.7 (7.2) and 6.8 (6.2) VMS per day, respectively. At week 12, women were experiencing 1.6 (2.5) and 3.4 (4.2) VMS per day, respectively. These reductions were maintained up to week 50. At week 12, the reduction from baseline was significantly larger with EZN than with PBO (least square mean difference: -1.6 VMS/day [95% confidence interval: -2.0, -1.1]; p<0.0001). At week 52, changes from baseline with EZN and PBO were -9.4 (8.4) and -5.7 (7.9) for the PROMIS SD SF 8b total T-score, and -1.3 (1.3) and -1.1 (1.4) for the MENQOL total score, respectively. Over 52 weeks, 70.0% and 61.1% of women in the EZN and PBO groups experienced at least one TEAE, respectively. The TEAEs that were reported more frequently in the EZN group were headache, fatigue and somnolence (Table 1). Serious TEAEs occurred in 4.2% and 1.9% of women, respectively, with none considered by the investigator treatment related. No cases of endometrial hyperplasia or malignant neoplasm were seen. There were no cases of drug-induced liver injury causally related to EZN as per assessment by the LSMB. Changes in BMD (femoral neck, hip, and lumbar spine) from baseline to week 52 were within expected age-related loss for both EZN and PBO. Weight remained stable over 52 weeks. **Conclusion:** EZN was an efficacious treatment for menopause-associated VMS, with a favorable long-term safety profile.

Sources of Funding: This study was sponsored by Bayer.

Treatment-emergent adverse events (safety analysis set)

TEAE, n (%)	Elinzanetant 120 mg (N=313)	Placebo (N=314)
Any TEAE	219 (70.0%)	192 (61.1%)
Any study-drug related TEAE	95 (30.4%)	46 (14.6%)
Any TEAE leading to discontinuation of study drug	39 (12.5%)	13 (4.1%)
Any serious TEAE	13 (4.2%)	6 (1.9%)
Most frequently reported TEAEs		
Headache	30 (9.6%)	22 (7.0%)
COVID-19	22 (7.0%)	32 (10.2%)
Fatigue	21 (6.7%)	9 (2.9%)
Somnolence	16 (5.1%)	4 (1.3%)
Nasopharyngitis	15 (4.8%)	21 (6.7%)

TEAE, treatment-emergent adverse event.

P-122.

Do sleep disturbances have an impact on depression and anxiety in perimenopausal and postmenopausal women? A US-based survey

Claudio Soares[1], Carina Dinkel-Keuthage[2], Victoria Banks[3], Sheila Drakeley[4], Kushal Modi[4], Kelly Genga[5], Lisa Halvorson[6], Kristina Rosa Bolling[6], Carsten Möller[2], Nils Schoof[2], Joehl Nguyen[6]. [1]Queen's University School of Medicine, Kingston, ON, Canada; [2]Bayer, Berlin, Germany; [3]Bayer, Reading, United Kingdom; [4]Oracle Life Sciences, Austin, TX; [5]Bayer, Sao Paulo, Brazil; [6]Bayer, Whippany, NJ

Objective: Vasomotor symptoms (VMS) and sleep disturbances are common menopausal symptoms and can adversely affect women's mood and wellbeing. We assessed the impact of sleep disturbances on depression and anxiety among peri- and postmenopausal women with and without VMS. **Design:** Data from peri- and postmenopausal women aged 40–65 years who completed the internet-based US National Health & Wellness Surveys in either 2019 or 2021 were analyzed. Individuals were categorized as perimenopausal if their menstrual bleeding ceased ≤12 months ago or was irregular (in frequency, duration, or flow heaviness); and postmenopausal if their menstrual bleeding ceased >12 months ago. They were then categorized by the presence or absence of VMS (defined as those reporting hot flashes/night sweats in the past 12 months). Following this, they were categorized by the presence or absence of sleep disturbances. Women with sleep disturbances were defined as those who self-reported sleep difficulties in the past 12 months or sleep symptoms experienced at least weekly, including difficulty falling asleep, night-time awakenings, and poor sleep quality. These sleep disturbances were considered likely to be related to menopause. Depression was assessed using Patient Health Questionnaire (PHQ)-9 on a scale of 0–27 and anxiety using Generalized Anxiety Disorder survey (GAD)-7 on a scale of 0–21. For both measures, scores of 0–4 indicated no depression/anxiety risk, 5–9 mild risk, and 10–14 moderate risk. For PHQ-9, scores of 15–19 indicated moderately severe and 20+ indicated severe depression risk. For GAD-7, scores of 15+ indicated severe anxiety risk. **Results:** This study included 6,005 perimenopausal (mean age: 48.5 years, SD: 5.1) and 21,616 postmenopausal women (mean age: 57.6 years, SD: 5.7). Among perimenopausal women, 60.1% reported VMS, of whom 61.7% experienced sleep disturbances; 38.0% had sleep disturbances in the absence of VMS. Among postmenopausal women, 43.4% reported VMS, of whom 66.7% had sleep disturbances; 44.5% reported sleep disturbances without VMS. Overall, both peri- and postmenopausal women who reported sleep disturbances also had higher depression (PHQ-9) and anxiety (GAD-7) scores than those without sleep disturbances, independently of VMS (Table 1). Multivariable analyses showed that PHQ-9 and GAD-7 scores in women with sleep disturbances (with or without VMS) were statistically higher (p<0.05) than the scores in women with no sleep disturbances or VMS. Mean PHQ-9 and GAD-7 scores were higher in perimenopausal than postmenopausal women. Women with VMS and no sleep disturbances had slightly lower mean PHQ-9 scores than those with no sleep disturbances or VMS, regardless of menopausal status; multivariable analyses showed that this score difference was statistically significant for perimenopausal but not postmenopausal women. In all cohorts, PHQ-9 and GAD-7 scores spanned the full range from 0–27 and 0–21, respectively. **Conclusion:** Sleep disturbances were common in both peri- and postmenopausal women. Although experienced more often by women with VMS, sleep disturbances were reported by almost half of women without VMS. In both peri- and postmenopausal women, depression and anxiety scores were greater among women with sleep disturbances than those without, regardless of VMS status. Depression and anxiety scores were also greater in peri- than in postmenopausal women, consistent with the window of greater vulnerability to these symptoms. Overall, these data suggested that sleep disturbances are associated with increased impact on depression and anxiety in peri- and postmenopausal women, independently of VMS. Thus, sleep disturbances should be properly recognized and promptly addressed to mitigate psychological changes in this population.

Sources of Funding: Bayer

Table 1. Marginal mean PHQ-9 and GAD-7 scores

		No sleep disturbances, no VMS	No sleep disturbances, VMS	Sleep disturbances, no VMS	Sleep disturbances, VMS
Perimenopausal women	n	1486	1380	912	2227
	Marginal mean PHQ-9 score [95% CI]	6.3 [6.0–6.6]	5.8 [5.5–6.1]	7.3 [6.9–7.6]	6.9 [6.7–7.1]
	Marginal mean GAD-7 score [95% CI]	4.6 [4.4–4.8]	4.7 [4.5–4.9]	5.0 [4.8–5.3]	5.1 [4.9–5.3]
Postmenopausal women	n	6781	3123	5444	6268
	Marginal mean PHQ-9 score [95% CI]	3.6 [3.5–3.7]	3.5 [3.3–3.6]	5.0 [4.9–5.1]	5.3 [5.2–5.4]
	Marginal mean GAD-7 score [95% CI]	4.6 [4.4–4.8]	4.7 [4.5–4.9]	5.0 [4.8–5.3]	5.1 [4.9–5.3]

P-123.

Associations of Street-view and Satellite-based Residential Greenspace with Menopausal Symptoms Among Women in Project Viva

Diana C. Soria-Contreras, PhD[1], Sheryl L. Rifas-Shiman, MPH[2], Marcia Pescador Jimenez, PhD[3], Jorge E. Chavarro, MD, PhD[1], Peter James, PhD[2,4], Emily Oken, MD, MPH[1,2]. [1]Nutrition, Harvard T.H. Chan School of Public Health, Jamaica Plain, MA; [2]Population Medicine, Harvard Pilgrim Health Care Institute, Boston, MA; [3]Epidemiology, Boston University, Boston, MA; [4]Environmental Health, Harvard T.H. Chan School of Public Health, Boston, MA

Objective: To evaluate the associations of exposure to street-view and satellite-based residential greenspace over one decade with menopausal symptoms in midlife women from Project Viva. **Design:** Project Viva is an ongoing prospective cohort that recruited 2100 women during the 1st trimester of pregnancy (1999-2002, mean age 32). We have followed participants for two decades into midlife. For this project, we included 686 participants with data on greenspace and menopausal symptoms. We assessed residential greenspace at three intervals from 2007-2010 (mean age 42) to 2017-2021 (mean age 52) using the normalized difference vegetation index (NDVI) from Landsat and deep learning algorithms applied to Google Street View (GSV) images. NDVI, ranging from -1 (water) to 1 (tropical rainforest), measures green vegetation within a 270-m buffer around participants' residences. GSV measures natural features and classifies vegetation types in a 500-m buffer around each address (continuous scale for % total greenspace, % trees, % grass, % other green, which includes plants, fields, and flowers). We examined cumulative exposure to greenspace estimated by NDVI and GSV from 2007-2010 to 2017-2021. We assessed menopausal symptoms using the validated Menopause Rating Scale (MRS) applied once in 2017-2021. The MRS queries the presence and severity of 11 symptoms over the past year (0= none to 4= very severe) and classifies them into three subscales of somatic (hot flashes/sweating, heart discomfort, sleep problems, and joint and muscle discomfort), psychological (depressive mood, irritability, anxiety, and physical and mental exhaustion), and urogenital symptoms (sexual problems,

bladder problems, and vaginal dryness). We analyzed total MRS and the subscales as continuous variables using linear regression, with NDVI and GSV greenspace modeled per interquartile range (IQR). For GSV, we included trees, grass, and other green simultaneously in the models. We adjusted the models for age at report of menopausal symptoms, sociodemographic characteristics at study baseline (marital status, education and income), and census tract median annual household income and urbanicity. **Results:** Participants were on average 52 years (SD 3.9) when they completed the MRS, and 48% were postmenopausal. The median total greenspace assessed by NDVI was 0.63 units (IQR 0.52 to 0.71 units) and 37.2% (IQR 28.4% to 44.6%) by GSV. The median MRS score was 7 (range 0-33) for total symptoms, 2 (0-14) for psychological, 3 (0-13) for somatic, and 1 (0-11) for urogenital symptoms. We did not observe associations between NDVI and total MRS score or the psychological or urogenital domain scores in unadjusted or adjusted models. For the somatic domain, there was a suggestion of a 0.25 lower somatic score (95% CI -0.53 to 0.03) per IQR higher NDVI in age-adjusted models, but this estimate was attenuated after full adjustment for covariates. GSV-based total greenspace or its components were not associated with the total MRS score or the urogenital domain score in either unadjusted or adjusted models. However, there was a suggestion that total GSV-based greenspace was associated with a higher MRS score in the psychological domain, indicating worse psychological symptoms (fully adjusted: β 0.46, 95% CI -0.01 to 0.93 per IQR higher % total greenspace). Other greenspace, which includes plants, fields, and flowers, was associated with higher scores in the psychological (β 0.28, 95% CI 0.02 to 0.54) and somatic domains (fully adjusted: β 0.24, 95% CI 0.00 to 0.48), indicating worse symptoms. No other associations were observed. **Conclusion:** Greenspace by NDVI was not consistently associated with total or domain-specific menopausal symptoms in midlife. However, higher total GSV greenspace was associated with greater psychological symptoms, and higher 'other' GSV greenspace was associated with greater psychological and somatic symptoms. Future studies exploring the role of greenspace as a potential factor influencing menopausal symptoms are warranted.

Sources of Funding: NIA and ORWH

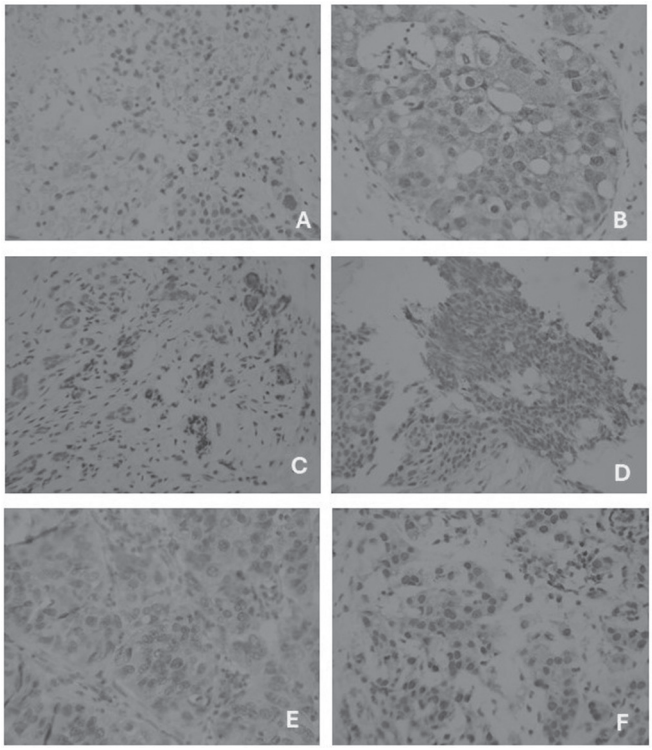
P-124.

The melatonin-induced PER-2 expression on the HER2-breast cancer of the postmenopausal women

JOSE M. SOARES-JUNIOR, MD, PhD[1], Gabriela B. Nóbrega, MD[1], Jose Cipolla-Neto, MD, PhD[2], Ricardo Hsieh, PhD[1], Silvia V. Lourenço, PhD[3], Isaque d. Ferreira, PhD[1], Isabel Cristina E. Sorpreso, MD, PhD[1], Karla Krislane A. Monteiro[1], José R. Filassi, MD, PhD[1], Edmund C. Baracat, MD, PhD[1]. [1]Laboratorio de Ginecologia Molecular e Estrutural da Disciplina de Ginecologia do Departamento de Obstetricia e Ginecologia, Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil; [2]Neurobiology Lab, Department of Physiology and Biophysics, Institute of Biomedical Sciences (Bldg 1), University of São Paulo, USP, SAO PAULO, Brazil; [3]Disciplina de Patologia Geral, Faculdade de Odontologia da Universidade de São Paulo, USP, São Paulo, Brazil

Objective: The PERIOD2 (PER2) gene is a core molecular component of the circadian clock and is regulated by melatonin. In-vitro studies have shown an overexpression of PER2 in tumor cells, including breast cancer cells, which have demonstrated a significant antiproliferative effect. Also, as melatonin interacts with estrogen receptor, the status of hormone receptor may interfere with PER2 expression. The aim of study was to evaluate the expression of PER2 in different molecular biological subtype of breast cancer using immunohistochemistry. **Design:** 100 breast cancer samples were used and classified: triple-negative; luminal A; luminal B; HER2; Hybrid luminal. After that, 3 μm-sections were deparaffin and rehydrated, followed by antigenic tissue recovery and the incubation of the primary serum of PER2 with dilution of 1:100 was applied, then secondary incubation was performed with the NOVOLINK Polymer detection system. The samples were revealed by the immunoperoxidase technique using the DAB chromogen and counterstained with Carazzi's hematoxylin. Immunoexpressions were qualitatively classified: 0 (absence); 1 (weak/moderate); 2 (intense) of PER2. The analysis of the results was done by two independent researchers. **Results:** Among the cases evaluated, PER2 immunostaining with nuclear and cytoplasmic patterns was observed. The expressions obtained and qualitatively classified were: Triple-negative: 0 (5%); 1 (47%); 2 (47%), Luminal A: 1 (50%); 2 (50%), Luminal B: 0 (5%); 1 (38%); 2 (55%), HER2: 0 (11%); 1 (29%); 10: (58%); Hybrid luminal: 1 (50%); 2 (50%). (Figure 1) **Conclusion:** The present study presents unprecedented results, which suggests a participation of PER2 in the pathogenesis of breast tumors, especially in the Luminal B and HER2 variants.

Sources of Funding: FAPESP #2023/12681-4 and # 2018/24224-9



A: Triple-negative presenting weak/moderate expression, with presence of tumor cells in mitosis. (400X); B: Luminal A showing strong/intense expression of tumor cells. (400X); C: Luminal B showing strong/intense focal expression in tumor cell clustering. (400X); D: Luminal B showing strong/intense expression observed in cells in the periphery of the tumor. (400X); E: Luminal hybrid showing strong/intense expression of tumor cells. (400X); F: HER2 showing strong/intense expression of tumor cells. (400X)

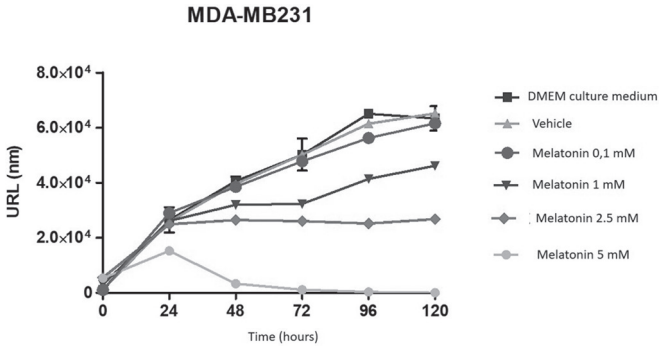
P-125.

Melatonin inhibits the proliferation of triple negative breast cancer cells

Isaque d. Ferreira, PhD[1], Cecilia S. Ferreira, MD[1], Katia C. Carvalho, PhD[1], Isabel Cristina E. Sorpreso, MD, PhD[1], Jose Cipolla-Neto, MD, PhD[2], Edmund C. Baracat, MD, PhD[1], JOSE M. SOARES-JUNIOR, MD, PhD[1]. [1]Laboratorio de Ginecologia Molecular e Estrutural (LIM-58) da Disciplina de Ginecologia do Departamento de Obstetricia e Ginecologia, Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil; [2]Neurobiology Lab, Department of Physiology and Biophysics, Institute of Biomedical Sciences (Bldg 1), University of São Paulo, University of Sao Paulo, SAO PAULO, Brazil

Objective: Melatonin, the main product released by the pineal gland, has been described in the literature as a highly pleiotrophic biomolecule and many of its actions play a relevant role in the promotion and progression of estrogen receptor positive cancer, such as: modulation of proliferation, differentiation and cell death or even anti-inflammatory properties, antioxidant, anti-angiogenic, anti-metastatic and immunomodulatory. However, this action is not clear on the estrogen receptor negative breast cancer. The aim of this study was to analyze the in-vitro effect of melatonin on the proliferation of adenocarcinoma and mammary cells, which are highly metastatic and do not express ER or PR and have low HER2 expression. **Design:** 10^5 MDA-MB231cells/mL were apllied. The treatment groups were: Control group (cells + DMEM culture medium); Vehicle Group (cells + culture medium containing ethanol, melatonin vehicle);Melatonin Group 0.1mM; Melatonin Group 1mM; Melatonin Group 2.5mM and Melatonin Group 5mM. The cells were kept in wells at 37ºC and in a humid atmosphere with 5% CO2. After 24h, 48, 72, 96 and 120h the cell population was analyzed by cell viability assay using a fluorescent marker (PrestoBlue® - Thermo Fischer Scientific). All specific dose and time were done in quadriplicate. **Results:** Our data revealed that melatonin 1 mM induced the viable cell population decreased by more than 50% between 72h and 96h of culture compared to the control group, a period in which there is greater cell proliferation in the untreated group. When treated with a higher concentration of melatonin (5 mM) the cell population is almost completely eliminated at the same time, which could indicate a cytotoxic effect of this hormone at high concentrations. **Conclusion:** Our data suggest that melatonin may decrease the triple negative cells, mainly with 1mM concentration. This effect may be an important ally for the for the development of new therapeutic approaches for triple negative type breast cancer, which determines the worst prognosis and survival of patients in the world.

Sources of Funding: FAPESP #2018/24224-9 and #2023/12681-4



Time and dose-response curve for melatonin in MDA-MB-231 cells

P-126.

"Menopausando: Digital Health Education Platform for Women in Transition to Menopause and Post-Menopause"

Maély Ignacio, Mariana G. Martins, Isabel cristina e. Sorpreso. University of São Paulo Medical School, São Paulo, Brazil

Objective: The transition from reproductive to non-reproductive life in women, known as climacteric, is marked by menopause, a significant moment in a woman's life cycle, characterized by the exhaustion of ovarian follicles and the consequent loss of reproductive function. This explains the symptoms experienced by women during the transition to menopause and post-menopause, such as hot flashes and mood swings. The National Women's Health Care Policy emphasizes the importance of health education to prevent non-communicable chronic diseases, with interventions focused on smoking cessation, healthy eating, and regular physical activity. The use of digital health technologies can increase women's engagement in self-care, fill communication gaps, and personalize services. The COVID-19 pandemic has increased interest in digital platforms to address climacteric and reduce health risks. Despite the potential of digital platforms to improve prevention, diagnosis, disease management, and guidance for women transitioning to menopause and post-menopause, there is still a scarcity of platforms specific to this topic. This project aims to demonstrate the implementation of a social media platform offering educational resources, updated and interactive content to address aspects of health, well-being, and lifestyle during climacteric, which contributes to an environment of dialogue and exchange of experiences. Additionally, to describe the access and engagement numbers of these vehicles and analyze their effectiveness as a health education strategy **Design:** The study is descriptive and exploratory, conducted by the Gynecology Discipline of the Department of Obstetrics and Gynecology at the Faculty of Medicine of the University of São Paulo, in Brazil. The sample is convenient, non-probabilistic, and uses the snowball sampling technique. Women over 40 years old, social media users between May and June 2021, during the COVID-19 pandemic, were interviewed. The women filled out an online form with questions about sociodemographic data and knowledge about topics related to climacteric. The researchers also used Google Trends to identify research trends on terms related to climacteric. After data collection, the responses were analyzed quantitatively using proportion, frequency, mean, and standard deviation. **Results:** The study analyzed 287 women over 40 years old, with an average age of 55.4 years. Regarding knowledge of terms related to menopause, most were familiar with "menopause" (95.5%) and "climacteric" (72.5%), while terms such as "post-menopause" (66%) and "perimenopause" (25.5%) were less known. Moreover, 78.8% of the women expressed interest in a platform with content on the topic, and the main words associated with the menopausal transition period included "mood swings," "heat," and "lack of libido." Consequently, social media channels and a website were created, and periodically, medical students record podcast episodes on topics relevant to women's health during climacteric, with specialized health professionals (Figure 1). The interview is published on Spotify and, based on this content, written articles are produced for the website, Instagram, and Facebook. Currently, the website has 22,000 users; Instagram has 2,602 followers; Facebook has 151 followers; Spotify has 7,961 streams, with a total of 15 episodes published; the YouTube channel, created in October 2022, has 26 subscribers and 237 views. **Conclusion:** The project is pioneering in creating social media platforms aimed at women transitioning to menopause and post-menopause. An important finding is that 10% of women do not know which period they are experiencing, highlighting the need for greater information and awareness about these phases. The project effectively reaches its target audience, primarily Brazilian women between 45 and 55 years old, providing an effective communication channel between the academic community and the general public. "Menopausando" has shown continuous growth in terms of access and users, establishing itself as an important extension tool for the Faculty of Medicine of the University of São Paulo by sharing knowledge about women's health during climacteric.

Sources of Funding: USP's Office of the Provost for Undergraduate Studies.

P-127.

Reclassification performance of a polygenic-integrated risk prediction model for ovarian cancer compared to a clinical-only risk model

Erika Spaeth Tuff, PhD[1], Gillian Dite, PhD[1,2]. [1]geneType Inc, Richmond, TX; [2]Melbourne School of Population and Global Health, University of Melbourne, Melbourne, VIC, Australia

Objective: More than half of ovarian cancer diagnoses are identified after the cancer has metastasized. While screening options do exist, they have not been shown to affect mortality rates when used in the general population. Accurate risk stratification may lead to a greater screening benefit by targeting screening to women at increased risk of ovarian cancer. We previously developed a risk prediction model that combines common clinical and polygenic risk factors to identify women at increased risk. The risk model calculates a 10-year risk score by taking into account a woman's age at risk assessment as well as her parity status, history of oral contraception, hormone replacement therapy, BMI, menopausal status, oophorectomy status and polygenic risk score. **Design:** Previous analysis showed the new risk model had improved calibration and discrimination compared to a clinical-only risk model. The new risk model uses information on parity, oral contraceptive use, menopause, hormone replacement therapy use, unilateral oophorectomy and body mass index, and a polygenic risk score consisting of 36 SNPs. Herein, we assess the reclassification performance of the 10-year and lifetime risk in a cohort of women aged 50–69 years from the UK Biobank (n=56,751). For the current analysis, we restricted the data to the 30% testing dataset from our previous paper and used the risk prediction model developed using the 70% training dataset. We used continuous net reclassification improvement analysis to compare the classification performance of the new model with that of the clinical-only model. Reclassification performance analyses are sensitive to the number of categories and the choice of thresholds. Because clinically actionable thresholds do not currently exist for ovarian cancer risk, we assessed reclassification using continuous analysis. We used bootstrapping with 1000 replications to estimate 95% confidence intervals (CIs) for the reclassification estimates. **Results:** The reclassification improvement was large for affected women using the new 10-year risk score compared to the clinical model alone (18.1%). The reclassification was -17.1% for unaffected women. Because ovarian cancer is rare and the prevalence is low in the cohort, it is extremely difficult to improve reclassification in the unaffected population. **Conclusion:** Analysis of reclassification performance can be useful for showing model improvement in these less prevalent cancers if we focus on the shift in classification for the affected population. This new polygenic-integrated clinical model shows a reclassification improvement in at-risk women who developed incident ovarian cancer over a 10-year period compared to a clinical-only model. Ovarian cancer is a difficult disease to screen for, however there are existing tools including CA-125 and transvaginal ultrasound that have shown a stage-shift in ovarian cancer diagnosis. These tools are not currently recommended for the general population becasue despite the stage shift, there was no ovarian cancer associated survival benefit observed. However, more recent follow up analyses of these longitudinal ovarian cancer screening trials have shown there indeed may be a survival benefit associated with the stage-shift. A risk assessment may enable us to target screening and risk-reduction options to those who are most likely to benefit.

Sources of Funding: Funding provided by Genetic Technologies Inc.

Percentage reclassification improvement for 10-year risk of ovarian cancer by affected and unaffected women aged 50-69.

Continuous	Reclassification improvement (%)	95% confidence interval	P value
Affected	18.1	4.5,31.7	0.01
Unaffected	-17.1	-17.9,-16.3	<0.001

The net reclassification between two risk models of observed in incident ovarian cancer cases over a 10-year period of time show that the new risk model (consisting of polygenic and clinical risk combined) improves prediction over a clinical model alone.

P-128.

Effect of hormone therapy on tryptophan metabolism and atherosclerosis progression among early postmenopausal women

Intira Sriprasert, MD PhD[1], Hooman Allayee[2], Naoko Kono[3], Roksana Karim[2], Howard N. Hodis[3,4], Wendy J. Mack[2,3]. [1]Department of Obstetrics and Gynecology, University of Southern California, Los Angeles, CA; [2]Department of Population and Public Health Sciences, University of Southern Califrornia, Los Angeles, CA; [3]Atherosclerosis Research Unit, University of Southern California, Los Angeles, CA; [4]Department of Internal Medicine, University of Southern California, Los Angeles, CA

Objective: The Early versus Late Intervention Trial with Estradiol (ELITE) demonstrated that hormone therapy (HT) significantly reduced atherosclerosis progression when initiated in early but not in late postmenopause. Previous evidence suggests that the tryptophan-kynurenine pathway is associated with cardiovascular disease in a variety of populations. We examined the effect of HT on plasma tryptophan-kynurenine pathway metabolites and their associations with atherosclerosis progression among early postmenopausal women. **Design:** A random sample of 80 ELITE early postmenopausal participants (40 each in placebo and HT groups) was selected for this study. Demographic information, serum estradiol (E2) levels, and carotid artery intima media thickness (CIMT) measurements were extracted. Plasma samples from baseline and 36 months were used for metabolomic analysis. Metabolite levels were analyzed in log transformed, standardized units. Effect of HT on metabolite levels were tested by repeated measure two-way ANOVA. Linear mixed effects models tested the association of plasma E2 with change in metabolite levels and the association between change of each metabolite with CIMT progression over a median follow up of 4.8 years. **Results:** Study participants had mean (SD) age of 55.4 (4.5) years and were 3.3 (1.7) years since menopause. Mean body mass index was 28 (6.1) kg/m^2. Approximately 75% were

non-Hispanic White, with remaining composed of 12.5% Hispanic, 7.5% Black, and 5% Asian. Compared with placebo, HT significantly reduced the kynurenate (-0.38; 95%CI -0.68, -0.08; p=0.01) and N-acetylkynurenine (-0.27; 95%CI -0.42, -0.12; p=0.0004) metabolites of tryptophan. Higher mean E2 level was significantly inversely associated with lower levels at 36 months compared to baseline of kynurenate (-0.0034; 95%CI -0.0053, -0.0015; p=0.0007) and N-acetylkynurenine (-0.0075; 95%CI -0.0111, -0.0038; p=0.0001). Changes in kynurenate and N-acetylkynurenine were positively significantly associated with CIMT progression. Lower kynurenate level (CIMT rate 0.006 μm/yr per unit of kynurenate; 95%CI 0.0018, 0.0101; 0=0.0048) and lower N-acetylkynurenine level (0.0131 μm/yr per unit of N-acetylkynurenine; 95%CI 0.0049, 0.0212; p=0.0017) were associated with lower CIMT progression. **Conclusion:** Plasma tryptophan-kynurenine pathway metabolites, in particular kynurenate and N-acetylkynurenine levels, are reduced by HT and associated with reduced atherosclerosis progression. The reduction in the metabolite levels between HT compared to placebo was supported by the associations with E2 level. The reduction in tryptophan-kynurenine metabolites by higher E2 levels could in part explain the effect of HT on reduction in atherosclerosis progression in early postmenopausal women. Further studies among late postmenopausal women should further explore these associations in comparison to early postmenopausal women to determine whether these findings explain the differential effect of HT on atherosclerosis progression by time since menopause.

Sources of Funding: Wright Foundation Pilot Award

Hormone therapy effects on tryptophan-kynurenate pathway metabolites compared with placebo and association of change of metabolite levels with atherosclerosis progression

	Hormone therapy effect		Association of change of metabolite levels with atherosclerosis progression	
Metabolites	*Estimate (95%CI)	p	**Estimate (95%CI)	p
Kynurenine	-0.07 (-0.16, 0.01)	0.10	0.0111 (-0.0006, 0.0227)	0.06
Kynurenate	-0.27 (-0.42, -0.12)	0.0004	0.0131 (0.0049, 0.0212)	0.0017
N-acetylkynurenine	-0.38 (-0.68, -0.08)	0.014	0.0060 (0.0018, 0.0101)	0.0048
Tryptophan	-0.01 (-0.08, 0.06)	0.71	-0.0010 (-0.0186, 0.0166)	0.91
N-acetyltryptophan	-0.03 (-0.16, 0.10)	0.63	0.0042 (-0.0052, 0.0136)	0.38

***Estimate and 95% confidence interval from repeated measure two-way ANOVA showing average difference due to hormone therapy (hormone therapy minus placebo) at 36 months, in log transformed, standardized units.**

****Estimate and 95% confidence interval from linear mixed effects model testing the association of change in metabolite level with atherosclerosis progression adjusted for baseline level.**

P-129.

Vascular Conductance in Females with Previous or Current Vasomotor Symptoms

William Stokes[1], Chowdhury Tasnova Tahsin, PhD[1], Miguel F. Anselmo[1], Stephany Nathe[1], Emma J. Lee, PhD[1], Soliana Teshome[2], Marnie Vanden Noven, PhD[3], Jason R. Carter, PhD[4], Manda L. Keller-Ross, PhD[1]. [1]Department of Family Medicine and Community Health, University of Minnesota, Minneapolis, MN; [2]Public Health, Johns Hopkins University, Baltimore, MD; [3]Department of Exercise Science, Belmont University, Nashville, TN; [4]Robbins College of Health and Human Sciences, Baylor University, Waco, TX

Objective: Introduction: Females who experience vasomotor symptoms (VMS; hot flushes and night sweats) of menopause demonstrate an increased prevalence of hypertension, which may be driven by vascular dysfunction. We tested the hypothesis that forearm vascular conductance would be reduced in females who have previously or currently experience(d) VMS compared with females who have never experienced VMS. **Design: Methods:** Twenty-nine postmenopausal females completed two study visits. Visit 1: Informed consent; medical questionnaire; Menopause-Specific Quality of Life Questionnaire (MENQOL). Participants were divided into two groups based on whether they currently experience or previously experienced VMS (ever-flushers: EF, n=17) or never experienced VMS (never-flushers: NF, n=12). Visit 2: Heart rate (HR; electrocardiography) and BP (finger plethysmography and automated sphygmomanometer) were recorded during a 10-min rest. Forearm blood flow was measured for three minutes via venous occlusion plethysmography. Forearm vascular conductance (FVC) was calculated by dividing forearm blood flow (FBF) by mean arterial pressure (MAP), multiplied by one-hundred [100 x (FBF/MAP)]. **Results: Results:** Groups were similar in age (mean±SD: NF: 60±3; EF: 61±6yrs, p=0.53), age of menopause (NF: 47±3; EF: 48±5yrs, p=0.64), and body mass index (NF: 27±5; EF: 28±5kg/m^2, p=0.41). Never-flushers did not experience VMS (1±0), as confirmed by the MENQOL, while EF who were currently experiencing VMS presented with moderate symptoms (4±1 out of 8, 8 being the most severe, p>0.01). Resting systolic BP (NF: 128±15; EF: 125±13mmHg, p=0.52), diastolic BP (NF: 84±13; EF: 83±9mmHg, p=0.91), and HR (NF: 61±11; EF: 62±10bpm, p=0.81) were similar between groups. In addition, FBF (NF: 1.85±1.26; EF: 1.30±0.55ml/100ml tissue/min, p=0.22) and FVC (NF: 1.75±1.14; EF: 1.25±0.58ml/100ml tissue/min/mmHg, p=0.23) were similar between groups. **Conclusion: Conclusion:** In this sample of postmenopausal females, EF did not exhibit a reduced FBF or FVC compared to NF, suggesting that current or previous history of VMS may not influence resting forearm vascular function.

Sources of Funding: This study was funded by a NIH R21 AG080503 (MKR), NIH 1 K01 AG064038-01A1 (MLKR), and National Institutes of Health's National Center for Advancing Translational Sciences, grant UL1TR002494

P-130.

Virtual Reality and Artificial Intelligence for Managing Menopause Symptoms: A New Emerging Necessity

Karisma K. Suchak, MD, MSHS[1,2], Nancy Safwan, MD[3,4], Omer Liran, MD, MSHS[1,2], Sheryl A. Kingsberg, PhD[5], Stephanie Faubion[3,4], Chrisandra Shufelt[3,4], Brennan Spiegel, MD, MSHS[1,2]. [1]Division of Health Services Research, Department of Medicine, Cedars-Sinai Medical Center, Los Angeles, CA; [2]Virtual Medicine Program, Cedars-Sinai Medical Center, Los Angeles, CA; [3]Division of General Internal Medicine, Mayo Clinic, Jacksonville, FL; [4]Women's Health Research Center, Mayo Clinic, Rochester, MN; [5]Department of Obstetrics and Gynecology, University Hospitals Cleveland Medical Center, Cleveland, OH

Objective: Menopause symptoms affect up to 80% of midlife women with vasomotor symptoms (VMS, hot flashes and night sweats) being the most common lasting on average 7-9 years. Although menopause hormone therapy is the most effective treatment for VMS, only 4-6% of women receive this treatment. Cognitive behavioral therapy (CBT) is an evidence-based, non-hormonal treatment for VMS that has proven effective in managing symptoms; however, it needs to be administered by a licensed provider and is often limited due to accessibility and cost. Virtual reality (VR) has shown promise in delivering CBT for medical conditions such as chronic pain, irritable bowel syndrome, and mood disorders. Generative artificial intelligence (AI), although still in its infancy, offers the hope of personalized healthcare solutions. A recent feasibility study pairing VR with artificial intelligence (VR-AI) provided early evidence of acceptability among users with anxiety and depression. With the rapidly evolving landscape of digital health technologies, there is a need to understand the potential role of medical VR and AI in menopause. We summarize the current literature regarding VR and AI for the management of VMS. **Design:** A comprehensive review of medical literature was conducted through PubMed, Web of Science, and ScienceDirect from 2012 to 2024 and were limited to articles written in English. The search strategy initially utilized keyword combinations of "menopause," "climacteric," "vasomotor symptoms," "hot flashes," "night sweats," "virtual reality," "augmented reality," "mixed reality", "extended reality." After which the keyword "artificial intelligence" was added as an "and" to our previous Boolean search. Study abstracts were manually reviewed for relevance. A Google search was also conducted to further identify current commercial VR solutions that exists for menopause. **Results:** Our search for VR and AI interventions found limited results with only 3 studies targeting menopause symptoms. One of which was a pilot study (n=42) evaluating a VR-AI intervention based on CBT techniques and mindfulness on women with breast or ovarian cancer experiencing hot flashes. This study revealed encouraging preliminary findings of significantly reducing intensity and frequency of hot flashes, improving sleep quality, reducing psychological distress, and improving quality of life but emphasized the need for controlled and more rigorous studies to understand the potential of such an intervention. This was also the only study that included an intervention arm that combined VR with AI. Another study proposed a protocol that used VR for pelvic floor muscle strengthening exercises in the management of urinary incontinence associated with menopause. The last study was a systematic review of VR interventions used during menopause; however, the included studies were not limited to VMS but showed improvements in the overall wellness of midlife women, including urinary incontinence, postural balance, cardiorespiratory capacity, osteoporosis, and lower back pain. **Conclusion:** Medical VR and AI have proven to be effective in administering CBT for various health conditions. Review of the current literature finds minimal to limited research related to menopause VMS. Since medical VR and AI offer a personalized and accessible solution using CBT it has the potential to improve quality of life and reduce symptom burden related to menopause. Future studies should focus on acceptability, feasibility and effectiveness for the treatment of VMS.

Sources of Funding: None

P-131.

Postmenopausal Females with Poor Self-reported Sleep Exhibit Lower Vascular Function

Chowdhury Tasnova Tahsin, PhD[1], Emma J. Lee, PhD[1], Miguel F. Anselmo[1], William H. Stokes[1], Stephany Nathe[1], Marnie Vanden Noven, PhD[3], Jason R. Carter, PhD[2], Manda L. Keller-Ross, PhD[1]. [1]Family Medicine and Community Health, University of Minnesota, Minneapolis, MN; [2]Baylor University, Wacco, TX; [3]Belmont University, Nashville, TN

Objective: Cardiovascular disease (CVD) is the leading cause of death in females after menopause in the United States. Menopause, which is the cessation of ovarian function, gives rise to a number of symptoms due to the loss of sex hormones, particularly estradiol. Sleep disturbance, a common and debilitating menopausal symptom, is associated with an increased CVD risk. Further, accumulating evidence suggests that vascular dysfunction is independently associated with CVD. However, the link between poor sleep and vascular function in otherwise healthy, postmenopausal females is unclear. Thus, the objective of this study was to explore if higher self-reported sleep disturbance and poor sleep quality are associated with vascular dysfunction in postmenopausal females. **Design:** Twenty-five postmenopausal participants (≥12 months without menses) completed two visits. Visit 1: written informed consent and completion of a medical questionnaire, the Pittsburgh Sleep Quality Index (PSQI), and the Insomnia Severity Index (ISI) questionnaires. Visit 2: conducted in the morning after an overnight fast and abstinence from alcohol, caffeine, and exercise for 12 hours, included continuous noninvasive blood pressure (BP) and heart rate (HR) recordings at rest and during a three-min forearm blood flow measurement via venous occlusion plethysmography. Forearm vascular conductance (FVC) was calculated by dividing forearm blood flow (FBF) by mean arterial pressure (MAP), multiplied by one hundred [100 x (FBF/MAP)]. **Results:** Participants were 60±4 years (mean±SD) and completed menopause at 46±4 years with a body mass index

of 26.2±4.5 kg/m^2. The average PSQI was 6±2 a.u. (range, 2 to12), and ISI was 6±4 a.u. (range 1 to 18). Average systolic BP was 127±14 mmHg, diastolic BP was 83±9 mmHg, and resting HR was 61±10 beats/min for all participants. Forearm blood flow was 1.05±0.4 ml/100 ml tissue/min, and FVC was 0.99±0.5 ml/100 ml tissue/min/mmHg. Participants PSQI tended to be associated with FBF (R^2=0.14, p=0.060) and was inversely associated with FVC (R^2=0.21, p=0.023). Subjective sleep efficiency, quantified by the PSQI, was positively associated with FBF (R^2=0.18, p=0.048) and FVC (R^2=0.19, p=0.045), although subjective sleep duration was not associated with FBF and FVC (p>0.05 for both). **Conclusion:** Our findings indicate that poor self-reported sleep, characterized by increased sleep disturbances and low sleep quality, is linked to reduced FBF and FVC in postmenopausal females, which may be contributing to greater CVD risk in postmenopausal females. Further research is needed to understand the key underlying mechanisms that link poor sleep with vascular dysfunction in this population.
Sources of Funding: This work was supported by NIH R21 AG080503 (MKR), K01 AG064038 (MKR) and 1F32HL160012 (EJL). National Institutes of Health's National Center for Advancing Translational Sciences, grant UM1TR004405.

P-132.

The association between adverse pregnancy outcomes and cardiovascular disease in menopausal women: results from a cross-sectional analysis

Marie Tan[1], Jenna Ehlert[1], Schyler Said[1], Erica Crawford[1], Maggie Feng[1], Hannah Daley[1], Emma J. Christensen[2], Matthew Nudy, MD[2], Xuezhi Jiang, MD, PhD[3], Peter Schnatz[3]. [1]Drexel University College of Medicine, Philadelphia, PA; [2]Penn State Health, Hershey, PA; [3]Reading Hospital/Tower Health, Reading, PA

Objective: Previous research has shown that a history of gestational hypertension (gHTN), preeclampsia, and gestational diabetes (GDM) are associated with an increased risk of cardiovascular disease (CVD). This study aims to assess the association between a self-reported history of preeclampsia or eclampsia (PreE/E), gHTN, and GDM with CVD outcomes in postmenopausal women. **Design:** Our survey was administered to 1,995 women presenting for mammogram screening. History of hypertension, diabetes, smoking, hypercholesterolemia, PreE/E, GDM, gHTN, family history of coronary artery disease, menopause status, and various CVD metrics were collected. In this analysis, CVD was a composite outcome and included a history of myocardial infarction, angina, abnormal angiogram, coronary revascularization, and stroke. A Chi-square test was conducted to analyze associations between history of PreE/E, GDM, gHTN, a combination of all three, and CVD outcomes. **Results:** A total of 383 (19.2%) women returned the survey. Mean age (±standard deviation) of women was 81.6 (±9.1) years. Forty (10.3%) women reported a history of CVD. Eleven women (2.8%) reported a history of PreE/E. Eight (2.1%) had a history of gHTN while 14 (3.6%) had a history of gestational diabetes. A self-reported history of gHTN was associated with CVD (χ^2 p<0.001). Women with PreE/E or all three adverse pregnancy outcomes had a numerically higher prevalence of CVD, however this did not meet statistical significance (p=0.395 and p=0.441, respectively). There was no association between gestational diabetes and CVD (p=0.679). **Conclusion:** A self-reported history of gHTN was shown to be associated with CVD in a population of postmenopausal women. PreE/E, gestation diabetes and a combination of the three was not found to be associated with CVD in this analysis. This study is limited by recall bias and small sample size. Future research is needed to understand the role adverse pregnancy outcomes may have in CVD development and risk stratification.

Sources of Funding: None

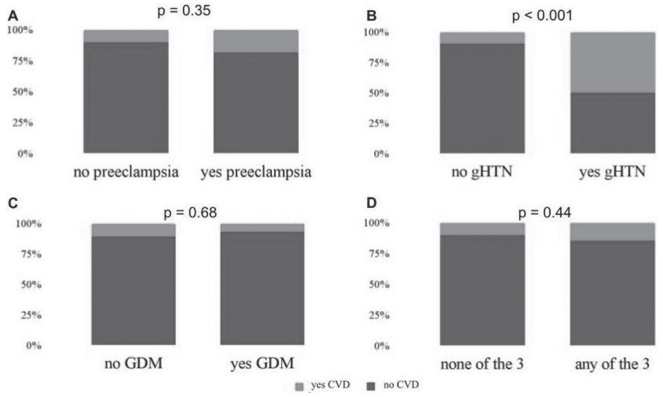


Figure 1. Preeclampsia/eclampsia (A), gestational hypertension (B), gestational diabetes mellitus (C), and any of the 3 pregnancy outcomes (D) and the percentage of those with and without CVD outcomes associated within each category. (Abbreviations: gestational hypertension (gHTN), gestational diabetes (GDM), cardiovascular disease (CVD))

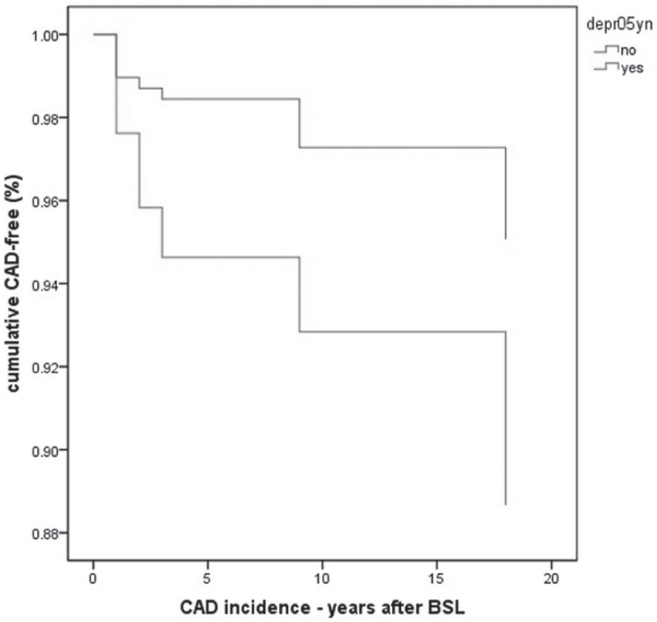
P-133.

The Association between Depression and Cardiovascular Disease in women: a Prospective 18-Year Follow-up Study

Schyler Said[1], Erica Crawford[1], Marie Tan[1], Maggie Feng[1], Hannah Daley[1], Jenna Ehlert[1], Emma J. Christensen[2], Matthew Nudy, MD[3], Xuezhi Jiang, MD, PhD[4], Peter Schnatz[4]. [1]Drexel University College of Medicine, Philadelphia, PA; [2]Penn State College of Medicine, Hershey, PA; [3]OB/GYN, Penn State Health, Camp Hill, PA; [4]OB/GYN, Reading Hospital Tower Health, West Reading, PA

Objective: Cardiovascular disease (CVD) continues to be the leading cause of death for women in the United States. Depression may be associated with incident CVD in women. Therefore, the objective of this study is to analyze the relationship between depressive symptoms and incident coronary artery disease (CAD). **Design:** Women were recruited at outpatient radiology visits in 2004. Initial survey questions collected demographics, depression history, CAD risk factors including hypertension, diabetes, hypercholesterolemia, and family history of CVD, in addition to CAD-related events. CAD events were a composite and included angina, myocardial infarction, and coronary revascularization. The 18-year follow-up survey was distributed via mail, e-mail, and telephone. A Chi-Square test was performed to describe the association between depression and incident CAD. A Mantel-Cox test was conducted to show the incidence of CAD in those with and without depression over time. **Results:** 1,995 participants filled the initial survey and after 18 years, 383 (19.2%) women completed the survey. Women with baseline depression were more likely to have CAD. (□□2 p=0.002). Over 18 years, women with depression were more likely to develop incident CAD compared to women without baseline depression (Mantel Cox p-value = 0.002, Figure 1). Figure 1: Mantel-Cox regression showing time to the development of CAD in those with and without depression at baseline. Abbreviations: coronary artery disease (CAD) **Conclusion:** Depressive symptoms and the incidence of CAD, as well as an association between depressive symptoms at baseline and the development of CAD over time. Further research should examine the role depression may have in cardiac risk assessment.

Sources of Funding: None



P-134.

Adapting an Integrative Group Medical Visit Curriculum for Community Health Worker Delivery: Mujeres en la Transición for Hispanic and Latina Midlife Women

Lisa J. Taylor-Swanson, PhD, MAcOM[1,2], Ana Sanchez-Birkhead, PhD, WHNP-BC, APRN[1], Jeannette Villalta[4], Anna C. Moreno, DO, MSCP[2], Isabel Dulfano, PhD, MA, MBA[3]. [1]College of Nursing, University of Utah, Salt Lake City, UT; [2]School of Medicine, University of Utah, Salt Lake City, UT; [3]World Languages & Cultures, University of Utah, Salt Lake City, UT; [4]MJV Diversity Consulting, Woods Cross, UT

Objective: Approximately 128M Hispanic/Latino people will reside in the United States (US) by 2050, and Latinas are projected to represent 25% of the total female population. Latinas enter menopause earlier and have longer-lasting symptoms than White non-Hispanic women. Latinas are also more likely to report urine leakage, vaginal dryness, increased heart rate, and perceived stress. Further, Latinas have a significantly worse cardiovascular disease risk profile than non-Hispanic White women. A recent study proposed that some health disparities experienced by Latinas are likely attributable to structural racism in the US. Thus, designing evidence-based interventions to improve symptoms and health screening rates for midlife Hispanic and Latina women is critical. The objective of this community-based project is to adapt a self-care and health education intervention to create a culturally and linguistically tailored intervention that includes health education, referrals to medical care and health screenings, and self-care including evidence-based integrative health approaches and the American

Heart Association's Life's Essential 8. **Design:** Our team has previously developed a promising intervention called MENOGAP (filling a GAP in MENOpausal care), which a prescribing provider and a licensed acupuncturist deliver. However, because two healthcare providers deliver MENOGAP, some Latinas are unable to access this intervention due to a lack of insurance coverage. Accessible and innovative delivery of MENOGAP is now made available with a community health worker (CHW) delivery. CHWs are frontline public health workers who are trusted members of the community. This project aims to adapt the existing MENOGAP manual so that CHWs can deliver it in a group setting, reaching more women and doing so in a manner congruent with Hispanic/Latina cultural values. We adapted the manual following the Framework for Reporting Adaptations and Modifications-Expanded (FRAME) approach and cultural adaptations were made following the integrated strategy for cultural adaptation approach. **Results:** The intervention adaptation has included FRAME components of *when* (pre-pilot, adaptations were planned), *who* (intervention developer, researchers, clinicians, linguist, CHW, Latina and White women all were involved in adaptations), *what* (content was modified, context was adapted, and training of staff is different), and *the nature of the content modification* (tailoring, adding and removing elements, cultural adaptation, translation into Spanish). The cultural adaptations were made following the integrated strategy for cultural adaptation and included: assessing and evaluating community beliefs, adapting the content and structure of MENOGAP to reflect cultural congruence, and implementing and evaluating the intervention. **Conclusion:** The curriculum adaptations provide a manualized intervention for future pilot testing of the Mujeres en la Transición ("Women in Transition") intervention for feasibility and acceptability with a cohort of Latina and Hispanic participants. The expected outcomes will provide preliminary data for a subsequent randomized controlled feasibility and acceptability trial assessing the ability to deliver the intervention with fidelity in the broader Hispanic/Latina community.
Sources of Funding: 1U4U Funding, Senior Vice President for Academic Affairs, and Senior Vice President for Health Sciences University of Utah

P-135.

Severe tiredness is associated with insomnia and depression of menopausal transition in women attending a menopause clinic

Masakazu Terauchi, MD, PhD[1], Yusuke Kori[2], Yuka Enokuchi[1], Tamami Odai[1], Naoyuki Miyasaka[2]. [1]Department of Women's Health, Tokyo Medical and Dental University, Tokyo, Japan; [2]Department of Obstetrics and Gynecology, Tokyo Medical and Dental University, Tokyo, Japan

Objective: Tiredness is one of the most frequent and bothersome symptoms of menopause. This study aims to investigate the factors associated with tiredness in middle-aged women attending a menopause clinic. **Design:** The first-visit records of 835 pre-, peri-, and post-menopausal women aged 40 to 65 years who enrolled in the Systematic Health and Nutrition Education Program at the Menopause Clinic of Tokyo Medical and Dental University Hospital were analyzed cross-sectionally. Two-group comparison was performed using the unpaired t-test and the Mann-Whitney test. The relationship between severe tiredness and the background characteristics was examined by multivariate logistic regression analysis. The research protocol was approved by the institutional review board. **Results:** The average age of the participants was 51.3 ± 5.1 years (mean ± SD). The percentage of women who were not bothered by tiredness, or bothered by mild, moderate, or severe tiredness was 14.0%, 22.9%, 15.2%, and 47.9%, respectively. Those who were bothered by severe tiredness (N=400) were compared with those who were not, or bothered by only mild to moderate tiredness (N=435), regarding background characteristics, including age, menopausal status, body composition, cardiovascular parameters, basal metabolism, physical fitness, symptom scores of somatic, vasomotor, insomnia, depression, and anxiety, and lifestyle factors. Those who were bothered by severe tiredness were found to be younger, earlier in menopausal transition (pre- or peri-menopausal), weaker in hand-grip strength, more severe in vasomotor, insomnia, depression, and anxiety symptoms scores, and less engaged in regular exercise than those with milder symptom. Multivariate logistic regression analysis revealed that the factors independently associated with severe tiredness were: pre- or peri-menopausal status (vs post-menopausal, odds ratio [95% confidence interval]: 1.54[1.31-1.81], $p<0.001$), depression symptom score (1.22 [1.17-1.28], $p<0.0001$), insomnia symptom score (1.20 [1.11-1.30], $p<0.0001$), and hand grip strength [kg] (0.95 [0.92-0.98], $p<0.0039$). **Conclusion:** Severe tiredness was prevalent in middle-aged women attending a menopause clinic, and was positively associated with pre- or peri-menopause, depression, and insomnia, and negatively associated with hand grip strength. Weak muscle strength might be useful as a physical indicator of tiredness caused by depression and insomnia of menopausal transition, which could be improved later in post-menopausal period.
Sources of Funding: Ibaraki Prefecture, Japan

P-136.

Waning Moon, a Menopausal Transition Health Promotion Intervention with Indigenous, Integrative, and Conventional Health Education: A Community-Based Approach with Urban American Indian/Alaska Native Women

Lisa J. Taylor-Swanson, PhD, MAcOM[1,2], Claudia Charles, MPH[3], Sara Simonsen, PhD, MPH[1], Sharon D. Austin, PhD, MPH[4], Leslie Crandall, MSN, RN[1], Jessica A. Ellis, PhD, CNM, FACNM[1], Jacqueline M. Kent-Marvick, PhD, RN[1], Lorna O. Khemchand[1], Sarai Negrete Macias, BSi[3], Anna C. Moreno, DO, MSCP[2], Madison E. Maughan[1], Ryan Ward, MPH[3]. [1]College of Nursing, University of Utah, Salt Lake City, UT; [2]School of Medicine, University of Utah, Salt Lake City, UT; [3]Urban Indian Center of Salt Lake, Salt Lake City, UT; [4]Family And Preventive Medicine, University of Utah, Salt Lake City, UT

Objective: This community-based project aimed to develop a Community Advisory Board (CAB) comprising midlife American Indian/Alaska Native (AI/AN) women to understand their experiences and needs related to healthcare during the menopausal transition and obtain guidance in creating a tailored intervention. Given the limited published information on AI/AN experiences of menopause, gathering data is critical. **Design:** Eligible participants included AI/AN women aged 40-55 who self-reported as peri- or post-menopausal. Recruitment took place at the Urban Indian Center of Salt Lake and through community outreach. We engaged in menopause discussions and collaboratively developed an intervention with the CAB during three recorded and transcribed focus groups. The intervention, named Waning Moon by the CAB, is nurse-delivered and includes evidence-based conventional and integrative health education, experientials, and self-care education in a group setting. Subsequently, we conducted three online sessions of Waning Moon with the same CAB members and collected demographic and menopause data before and after the sessions. Descriptive statistics and a qualitative-descriptive approach were used for analysis. Transcripts were iteratively coded using content and thematic analysis. **Results:** Among our 9 non-Hispanic AI/AN participants, when asked if their menopausal symptoms had bothered them, women reported being severely bothered (11.1%), moderately bothered (11.1%), somewhat bothered (44.4%), and not bothered (33.3%), emphasizing the varied experiences within this sample. Before the intervention, use of integrative health interventions varied, with yoga and massage therapy each being used by 22.2% of participants. In comparison, mindfulness-based stress reduction was utilized by 55.6%, meditation by 44.4%, aromatherapy by 22.2%, and 33.3% opting for other interventions. However, none of the participants had utilized acupuncture, acupressure, or tai chi for their peri- or menopausal symptoms. Before the intervention, participants' attitudes towards integrative therapies were mostly "unsure" or unlikely to be utilized as a treatment for menopausal symptom relief. Following the intervention, participants utilized all forms of integrative therapies except tai chi and were more likely to utilize those therapies for peri- and post-menopausal relief. Participants reported high levels of social support and self-efficacy and low levels of patient activation at both time points. Four themes emerged: 1) lack of and desire for menopause transition information; 2) barriers to accessing care; 3) matriarchal priorities resulting in negative personal health outcomes; and 4) preferences for Indigenous, natural, and integrative medicine as first-line interventions, followed by conventional medicine. **Conclusion:** Among this sample of urban AI/AN women, there was a great need and interest for information about menopause, both for the women themselves and for teaching their daughters and family members. Integrative, natural, and Indigenous approaches were requested as first-line care. A group setting was a comfortable format for needs assessment and education. The proposed next steps are to develop a suitable comparator and test this intervention with indigenous, integrative, and conventional medical content for efficacy.
Sources of Funding: Vice President for Research (VPR), University of Utah

P-137.

Inference of menopausal gene expression changes in cardiometabolic tissues by identification of female-specific aging genes

Elizabeth Theusch, PhD. University of California, San Francisco (UCSF), Oakland, CA

Objective: The hormonal changes of menopause have downstream physiological consequences, including an increase in women's cardiometabolic disease risk, but the molecular mechanisms underlying this increased risk remain unclear. Since steroid hormones often function via gene regulation by their nuclear receptors, this study sought to identify menopause-induced transcriptomic changes in cardiometabolic tissues that may mediate downstream menopause-related physiological changes. **Design:** Unfortunately, most human tissue gene expression datasets are missing menopausal status as a covariate, do not contain tissues of relevance to cardiometabolic disease, and/or have limited sample sizes, so innovative approaches are necessary to maximize the utility of available datasets for menopause research. Age is strongly correlated with menopausal status and is most often captured as a covariate, so this study sought to identify female-specific aging genes in cardiometabolic tissues as a proxy for menopause-regulated genes. This was based on the reasoning that genes with strong correlations with age in women that differ from the relationships seen in men (i.e. with sex*age interactions) are likely regulated by female-specific hormone changes, rather than chronological aging in general. The primary dataset used in this study was transcriptomic data from 54 tissues donated postmortem by 312 women and 636 men (aged 20-70) to the Genotype-Tissue Expression (GTEx) project. Though the primary focus of the current analysis was cardiometabolic tissues, these approaches were expanded to all GTEx tissues with sufficient sample sizes, since menopause has wide-ranging effects on the body. Female-specific aging genes were also identified using datasets outside of GTEx, including subcutaneous adipose and skeletal muscle biopsies from 260 African Americans (121 women and 138 men aged 18-60) available in GEO (GSE95674, GSE95675). **Results:** Female-specific aging genes were

identified in a variety of GTEx tissues, with the most identified in the breast, as expected. Genes encoding immunoglobulins (which are secreted in breast milk and are hormone-regulated) decreased in expression in the female, but not the male, breast. Significant sex*age interactions were also seen in other tissues. The known estrogen-regulated gene *GREB1* (growth regulating estrogen receptor binding 1) displayed female-specific decreases in gene expression across many tissues, including adipose, arteries, and skin. Of particular relevance to cardiovascular disease, *GUCY1A2* (which stimulates vasodilation) was negatively correlated with age in the female coronary artery and aorta. In visceral adipose tissue, renin (*REN*) expression levels were dramatically higher in many older women compared to younger women, potentially contributing to postmenopausal increases in visceral fat mass and blood pressure. In the subcutaneous adipose biopsy GEO dataset, 1,531 were genes significantly correlated with age in women, and 130 of these showed a significant sex*age interaction (FDR=5%). Similarly, among 972 genes significantly correlated with age in skeletal muscle biopsies from females, 152 showed significant sex*age interactions (FDR=5%). These "female-specific aging" genes were involved in a variety of processes, including inflammation, lipid metabolism, glucose metabolism, response to hormones, and blood pressure regulation. **Conclusion:** Through the use of a sex*age interaction approach, human tissue gene expression datasets without menopausal status information can be used to infer menopause-induced changes in gene expression in cardiometabolic disease-relevant tissues. This type of approach can help to uncover molecular mechanisms by which the hormonal changes of menopause increase cardiometabolic disease risk.
Sources of Funding: NIH R03AG075466 and NIH R21HL167188 supported this study.

P-138.

An advanced and standardized medicinal botanical blend for the natural management of underlying systems support of vasomotor symptoms.

John P. Troup, Ph.D. Blueroot Health Institute, Inc, Middletown, CT

Objective: An estimated 80% of women between the ages of 45 and 60 years of age experience vasomotor symptoms yet only 25% receive treatment. While hormone replacement (HR) has been considered to be the most effective treatment, a number of other treatments are available including non-HR prescription medications, traditional herbs and lifestyle support programs. Many of these treatments are focused singularly on the symptomatic issue of 'hot flashes' and without consideration of the root cause and underlying system causing the 'hot flash' response. Previous epidemiological reviews (JAMA 315(23): 2554-2563;2016) suggest that the increased risk and changes in cardiovascular health may be contributing to the development of hot flashes and other symptoms defining 'vasomotor' responses. This insight might suggest that more effective approaches to manage these issues could be one of a system targeted effect that may have effective and longer lasting benefits. The objective of this study was to determine whether a novel and standardized medicinal botanical targeting activation of receptors important to cardiovascular and mood response centers can provide more direct impact than widely used and unsubstantiated botanicals while also minimizing concerns on the use of HR therapy. **Design:** This study was designed to assess mechanism of actions and clinical outcomes on the use of a novel and standardized medicinal botanical blend comprised of naturally occuring phyto-active compounds of hydro-stilbenes (>40% rhapontocin from Siberian Rhubarb 5mg (*Rheum rhaponticin L.)* with terpenes (>10% beta-caryophyllene from Kopaiba Oil 50mg (*Copaifera langsdorffii)*). Using a 5-point dose response assessment for their ability to activate receptors known to modulate menopausal transition, mood, metabolic, and immune outcomes. Mechanistic data reflective of select underlying systems was collected from cell cultures utilizing human reporter functional assays and compared to the established reference agonists. Cannabinoid receptor 2, CBR2 Glucagon-Like Peptide-1 Receptor, estrogen alpha and beta receptors and Inflammation resolution in macrophage cell culture. Following this analysis, confirmation of response using the rat model to assess mood improvement and temperature control reaction were carried out. With the confirmed phyto-active botanical blend an initial pilot case observation study was carried out in peri-menopausal women with a history of cardiovascular risk and reporting mood and hot flash responses. 50mg capsules of the standardized phyto actives were used one time daily for 6 weeks. Standardized surveys to report feelings of mood states and descriptions of hot flash incidence and frequency were completed daily. **Results:** Results from the experimental study revealed that the phyto-active blend was a specific estrogen-beta receptor activator and a preferential CB2 receptor activator with activity 2x greater ($p<0.05$) than activation of CB1 receptors. Inflammatory resolution in macrophages significantly ($p<0.05$) improved by 30% vs control vehicles. Animal model responses demonstrated improvement in perception of heat and decreased withdrawal response along with reduced levels of anxiousness and less agitation. Results of the clincial case observation study component revealed a fast acting response (decreased reporting of hot flash severity withn 3 weeks; $p<0.05$), reduced incidence of hot flash discomfort and decreased severity of hot flashes by completion of the intervention. These improvements were reported by 60% of participants and included positive description of combined improvement in reported mood and hot flash experiences. **Conclusion:** These results provide initial mechanistic and clinical support for the natural and effective use of a novel standardized phyto-active blend resuling in significant improvement in self-reported experiences of hot flashes and positive mood states. Use of this medicinal botanical blend can provide women with an advanced, safe and effective natural alternative to HR and unsubstantiated herbal products by influencing the underlying systems effecting the symptoms of peri-menopause. Further longer term clincial studies are currently planned.
Sources of Funding: Funding provided by Blueroot Health, Inc. Middletown, CT

P-139.

S-equol supplement (SE5-OH) affects exercise training-induced improvement in arterial compliance in Japanese postmenopausal women

SHIGETO UCHIYAMA, Fellow[1], Koichiro Hayashi[2], Tomomi Ueno[1], Nami Ito[1]. [1]Saga Neutraceuticals Research Institute, Otsuka Phaermaceutical Co., Ltd., Kanzaki-gun, Japan; [2]Institute of Health and Physical Education, Department of Human Development, Kokugakuin University, Yokohama, Japan

Objective: Equivalent to 74% of deaths are caused by non-communicable diseases (NCDs) Globally. Cardiovascular diseases (CVDs) account for most NCD deaths, and 17.9 million people are killed annually. One of the most important behavioral risk factors of CVDs is physical inactivity. In women numerous comforts emerge with menopause and decreasing central arterial compliance, leading to CVDs, also occur. Equol, which is an intestinal bacterial metabolite of soy isoflavone daidzein, shows estrogen-like bioactivity. Approximately 20-30% of Westerns and ~50% of Asians can produce equol in their body. The clinical trials of *S*-equol supplement (SE5-OH) in Japanese and USA suggested that *S*-equol had beneficial effects for menopausal symptom relieves, bone health, metabolic syndrome risk reduction, and skin aging inhibition in postmenopausal women. Furthermore, we have previously reported that equol-produers increased carotid arterial compliance with aerobic exercise training in postmenopausal women. In this study, we assess whether intake of *S*-equol supplement (SE5-OH) in healthy postmenopausal equol non-producers could enhance the effects of exercise in arterial compliance. **Design:** A double-blind, placebo-controlled, randomized crossover study was conducted comparing the effects of oral consumption of *S*-equol supplement (SE5-OH, *S*-equol 10mg/day) or placebo (*S*-equol 0mg/day) for 12 weeks. Twenty-two healthy Japanese postmenopausal equol non-producers aged 52-67 years old were attended in this study. During the study participants underwent supervised aerobic exercise training 2-3 days/week. Carotid arterial compliance, β-stiffness, flow mediated dilation (FMD), and pulse wave velocity (PWV) was obtained before and after 12 weeks, and blood oxidative stress (biological antioxidant potential : BAP) and reactive oxygen metabolites test : d-ROM) were also measured at the same time. **Results:** Finally, thirteen postmenopausal women were analyzed. Arterial compliance, β-stiffness index and FMD was significantly improved after each intervention. Change of β-stiffness index after 12 weeks was significantly decreased in equol intervention ($7.82 \pm 3.02 \rightarrow 6.09 \pm 1.53$ (-1.73 ± 1.69) Unit) compared to placebo ($6.79 \pm 1.77 \rightarrow 6.25 \pm 1.76$ (-0.54 ± 0.86) Unit, $p < 0.05$). The changes of oxidative stress index (BAP/d-ROM) was increased significantly in equol intervention ($6.71 \pm 1.13 \rightarrow 7.24 \pm 1.37$ (0.54 ± 0.60) ratio) than placebo ($6.96 \pm 1.12 \rightarrow 6.96 \pm 1.04$ (0.00 ± 0.66) ratio, $p < 0.05$). Subgroup analyses were performed on women who were at least 5 years postmenopausal (n=11), and the increase in β-stiffness index was significance between equol intervention ($8.05 \pm 3.32 \rightarrow 6.06 \pm 1.62$ (-1.99 ± 1.72) Unit) and placebo ($6.90 \pm 1.88 \rightarrow 6.44 \pm 1.85$ (-0.46 ± 0.91) Unit, $p < 0.05$). and similar trend was observed on arterial compliance (equol intervention; $0.090 \pm 0.038 \rightarrow 0.114 \pm 0.037$ (0.025 ± 0.014) $mm^2/mmHg$, placebo intervention; $0.101 \pm 0.039 \rightarrow 0.113 \pm 0.044$ (0.012 ± 0.017) $mm^2/mmHg$, $p < 0.1$). **Conclusion:** Aerobic exercise with *S*-equol improved arterial compliance and stiffness more than that of exercise alone, especially in menopausal women after 5 years when the hormone fluctuation was stable. The improvement of oxidative stress status may be implicated in this effect.
Sources of Funding: None

P-140.

Sexual Function and Associated Factors in Women of Heterosexual Couples Aged 50–70 Years: The Importance of Male Assessment

Ana Lucia R. Valadares, MD, PhD, LUCIA COSTA-PAIVA, MD, PhD. OBSTETRICS AND GYNECOLOGY, STATE UNIVERSITY OF CAMPINAS, CAMPINAS, Brazil

Objective: To assess the prevalence of female low sexual function and the male and female associated factors among couples aged 50–70 years. **Design:** This cross-sectional study included 266 couples. Snowball sampling was used to select women from the "ego" couples who were interviewed. The "egos" or initial participants came from the personal or professional contacts of women who attended or worked in different clinics in Brazil, between March 2022 and March 2023. Interviews were conducted separately with the couple. Univariate and multiple logistic regression analyses were used to study the factors associated with the female low sexual function in the last four weeks. **Results:** The average age of the women was 57.45 (5.08) years and that of men was 59.97 (6.28) years; most participants were Caucasian, and 92.9% of women were postmenopausal. 46,8% had low sexual function. Results of the multiple logistic regression analysis for female sexual dysfunction (n=209) showed that main factors associated with female low sexual function were: Satisfaction with partner as a lover 4-6 (p=0.004, OR=0.16, 0.05 – 0.55, CI 95% O.R.0.05 – 0.55), Vaginal dryness None/Somewhat intense (p=0.001, OR=0.27, CI 95% O.R 0.14 – 0.52); Male erection problems Yes (p=0.009, OR=3.57,CI 95% O.R.1.38 – 9.24),Woman's formal education >8 years-≤ 11 years (p=0.004, OR=0.12,CI 95% O.R.0.03 – 0.50) and Higher/Postgraduate (p=0.038, OR=0.23,CI 95% O.R.0.06 – 0.92); Men's sexual performance Sometimes/Half times (p=0.009, OR=0.08,CI 95% O.R.0.01 – 0.54) and Most often/Always (p=0.027, OR=0.15,CI 95% O.R.0.03 – 0.81). **Conclusion:** Women most at less risk of low sexual function female were: those with satisfaction with their partner (risk 84% lower for those with '4-6'), those with less vaginal dryness (73% lower risk for those with 'none/little intense'), those with more education (88% lower risk for those with 12 years and 77% lower for those with graduation/postgraduation) and those with a better male sexual performance (92% lower risk for those with at sometimes/half of the time and 85% smaller for those with most times/always). Women with partners with male erection problems had a risk 3.6 times higher than those with partners with

little or no problems. These findings reinforce the need to ask about and address sexual function in clinical settings. The data also reinforce that partners' sexual health and approaches are required and very important to women's sexual function and experiences. Moreover, it can improve the quality of the couples' relationship.
Sources of Funding: Funding: The São Paulo Research Foundation (FAPESP) Process 2020/04708-1

P-141.
Premenstrual Dysphoric Disorder: systematic review of alternative treatments

Roberto C. Verdade, Master's degree[1,2], Adriana O. Pedro, PhD, MD. MSCP[1], Fernando D. Motta, Residency[2]. [1]Gynecology, State University of Campinas (Unicamp), Campinas, Brazil; [2]Bairral Institute of Psychiatry, Itapira, Brazil
Objective: Review the literature on alternative treatments for Premenstrual Dysphoric Disorder (PMDD) **Design:** A systematic review of randomized clinical trials (RCTs) was conducted on alternative treatments for PMDD (excluding antidepressants or contraceptives), specifically selecting cognitive-behavioral therapy (CBT), physical exercise, and vitamin B6 for subsequent specific analysis. PubMed and Embase databases were searched from 2000 to 2022 using the search terms premenstrual dysphoric disorder and premenstrual syndrome combined with each treatment term: cognitive behavioral therapy, exercise, and vitamin B6. For the overall review of alternative treatments, no combining terms were used, and RCTs using antidepressants or contraceptives were excluded based on title and abstract analysis. The study is registered in PROSPERO under CRD42024528098. Risk of bias analysis was performed using the RoB 2 tool **Results:** For the broad analysis of alternative treatments, 22 RCTs were selected. There was no significant effect observed for myo-inositol, clonidine, magnesium sulfate, quetiapine combined with antidepressants, chromium polynicotinate combined with sertraline, light therapy, or auriculotherapy. However, there was a significant effect observed for massage (one study, high risk of bias), cognitive-behavioral therapy (CBT) (two studies, elevated risk of bias), buserelin (one study, low risk of bias), dutasteride (one study, low risk of bias), acupuncture (one study, elevated risk of bias), sepranolone (one study, low risk of bias), phosphatidylserine (one study, low risk of bias), emotion-focused group therapy (one study, high risk of bias), and homeopathic treatment (one study without blinding and placebo control, high risk of bias). Vitex agnus castus had a similar effect to fluoxetine (one study, some risk of bias). In specific analyses, CBT was evaluated in 9 RCTs, physical exercise in 7 RCTs, and vitamin B6 in 4 RCTs. All studies reported a significant effect of CBT on symptom reduction, but all had an elevated risk of bias due to outcome measurement issues. Different types of physical exercises — running, aerobic exercises, yoga, swimming, and pelvic floor exercises — showed significant symptom reduction, except for pelvic floor exercises, which did not outperform the control with kinesio tape. Similar to CBT, RCTs on physical exercises also had an elevated risk of bias due to outcome measurement issues and the lack of blinding, often using wait-list controls. Regarding vitamin B6, three studies showed efficacy, but only two evaluated vitamin B6 alone. The study comparing vitamin B6 with a micronutrient complex found no difference. Among the four studies, only one had a low risk of bias, while two had an elevated risk due to randomization issues, and one had some concerns due to outcome measurement problems **Conclusion:** CBT and physical exercises appear to be effective as complementary treatments for PMDD, but the literature lacks robust evidence. Vitamin B6, along with other alternative treatment methods, has scarce and often low-quality evidence. Further research is needed for better clarification. Other methods, such as the herbal remedy Vitex agnus castus, buserelin, and phosphatidylserine, may be interesting alternative treatments but require further elucidation. It is important to note that these therapies should be considered as adjuncts to treatments with antidepressants or hormonal contraceptives, which have stronger and better-quality evidence. Patients who do not wish to use these medications or who have milder premenstrual symptoms that do not greatly impact their quality of life may also benefit from alternative therapies.
Sources of Funding: None

P-142.
Premenstrual Dysphoric Disorder: a systematic review of treatments with antidepressants and contraceptives

Roberto C. Verdade, Master's degree[1,2], Adriana O. Pedro, PhD, MD. MSCP[1], Fernando D. Motta, Residency[2]. [1]Gynecology, State University of Campinas (Unicamp), Campinas, Brazil; [2]Bairral Institute of Psychiatry, Itapira, Brazil
Objective: Review the literature on treatments for Premenstrual Dysphoric Disorder (PMDD) with antidepressants and hormonal contraceptives **Design:** Systematic review of placebo-controlled randomized clinical trials (RCTs) with antidepressants and hormonal contraceptives for PMDD. Searched Pubmed database from 2000 to 2022. Search terms were "premenstrual dysphoric disorder" combined with "antidepressants" and "contraceptives". PROSPERO registration CRD42024528098. RoB2 tool used for risk of bias anaylsis **Results:** Seventeen placebo-controlled RCTs with antidepressants were identified: seven with sertraline, three with fluoxetine, one with venlafaxine, five with paroxetine, and 1 with escitalopram. Seven evaluated continuous use, five evaluated luteal phase use, three compared both, and 2 evaluated use only in symptomatic phase. Antidepressants were effective in reducing psychological and somatic symptoms of PMDD and improving quality of life. There was no significant difference between continuous or luteal phase administration, except for a lesser effect on depressed mood and somatic symptoms with intermittent use of paroxetine. There was no greater occurrence of withdrawal symptoms, including with luteal phase use of paroxetine. Use of paroxetine in symptomatic phase was not effective, whereas the use of sertraline showed improvement, especially in anger/irritability symptoms. Of the 17 studies, 15 had a low risk of bias, and 2 had some concern in only one domain - one in the randomization process and 1 in the selection of reported results. Six studies with contraceptives were found: one with levonorgestrel and ethinyl estradiol, one with ulipristal acetate, and 4 with drospirenone and ethinyl estradiol. All used a dosing interval, except 1 which compared intermittent use with continuous use. Two studies did not find a significant reduction in general premenstrual symptoms, with 1 of them not having enough participants. The 2 largest studies found a significant reduction in symptoms, although they had high discontinuation rates. Five of six studies had some concern for risk of bias due to deviations from intended interventions, and 1 had a high risk of bias in the same domain **Conclusion:** Antidepressants have the most and best quality evidence for use in PMDD. Their effect appears to emerge quickly and at lower doses than those commonly used for depression or anxiety, allowing for intermittent use, during luteal phase. Use only during symptomatic phase showed uncertain results, requiring further clarification. Sertraline has the highest number of studies. Contraceptives have fewer studies than antidepressants and evidence with higher risk of bias. Despite this, drospirenone and ethinyl estradiol contraceptives seem to be effective. The findings reinforce the recommendations of major guidelines and current clinical practice, providing health professionals with more evidence to guide treatment choices
Sources of Funding: None

Figure 1: Flowchart of the selection of placebo-controlled RCTs using antidepressants for PMDD.

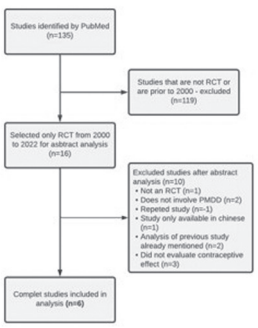
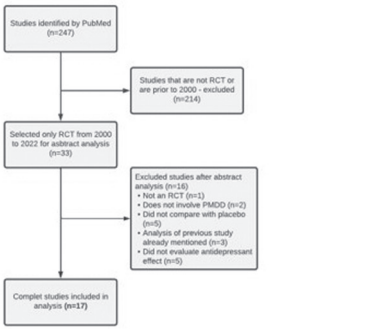


Figure 2: Flowchart of the selection of randomized placebo-controlled clinical trials using contraceptives for PMDD.



P-143.
Establishing a Research Cohort to Study Menopause and Alzheimer's Disease Risk

Amber Watts, PhD[1,2], Pilar Thangwaritorn, MA[1], Valerie Medina, MS[1], Melanie Meister, MD[3], Jaime Perales-Puchalt, PhD[2], Pallavi Khanna, MD[4]. [1]Psychology, University of Kansas College of Liberal Arts and Sciences, Lawrence, KS; [2]Alzheimer's Disease Research Center, University of Kansas Medical Center, Kansas City, KS; [3]OBGYN, University of Kansas Medical Center, Kansas City, KS; [4]OBGYN, University of Tennessee Health Sciences Center, Memphis, TN
Objective: Two-thirds of Alzheimer's disease patients are women. Menopause characteristics may contribute to increased Alzheimer's disease risk. We sought to establish a cohort of middle-aged women in our NIH designated Alzheimer's Disease Research Center to investigate these associations. We describe data from our baseline observation including sociodemographic characteristics, menopausal history, family dementia history, and lifestyle risk factors. Results support a funding application to evaluate associations between vasomotor symptoms, sleep, and cognition in peri- and recently post-menopausal women. **Design:** We recruited women ages 40-60, from the Kansas City and Wichita areas. Via online surveys offered in English and Spanish, we collected sociodemographic data (including age, ethnoracial group), reproductive history (including menopause symptoms), health history (including family dementia history), and lifestyle factors data (including Pittsburgh Sleep Quality Inventory). We developed this project with the long-term aim of establishing a cohort for longitudinal follow-up. **Results:** 104 women (Mean Age 49.8) completed assessments. The sample identified as 23% Hispanic, and among non-Hispanics, 21% Black, 50% White, and <6% another race. 14% were pre-menopausal, 27% were peri-menopausal, 22% were post-menopausal (spontaneous), 22% reported surgical menopause, 15% had no periods for other reasons or were unsure. Overall, 40% and 39% reported difficulty concentrating and poor memory respectively, after the age of 40. Hispanic participants reported fewer cognitive symptoms ($X2$(df) = 5.8(1), p=.016) compared to non-Hispanic participants. Vasomotor symptoms (hot flashes and night sweats) were also reported less frequently by Hispanics ($X2$(df)=3.6(1), p=.038) in our sample. Presence of vasomotor symptoms were significantly associated with reports of difficulty concentrating and poor memory ($X2$ range 4.2–23.8, ps range .04 to <.001). We identified differences in these associations by ethnoracial group, likely due to the lower reports of both vasomotor and cognitive symptoms in our Hispanic subsample. In our total sample, 55% of participants reported having a parent with cognitive problems, 29% diagnosed with dementia or cognitive impairment. Non-Hispanic White women were more likely to report a parent with memory problems ($X2$(df)=5.6(1), p=.018). Self-reported vasomotor symptoms were not associated with global sleep quality (t(df)=-1.35 (89), p = .18), but worse global sleep quality predicted greater likelihood of reporting difficulty concentrating after accounting for age (β=.373, p<.001). **Conclusion:** We established a racially and ethnically diverse cohort of middle-aged women to investigate associations between menopause characteristics and Alzheimer's disease risk. We found significant differences by ethnoracial group in the types of menopause symptoms reported and significance of associations between vasomotor symptoms and reported cognitive symptoms. Prior

research suggests that subjective cognitive complaints during the menopause transition are validated by neuropsychological test batteries. Over half of our sample had a parent with cognitive problems and nearly one-third were diagnosed with cognitive impairment or dementia, again varying by ethnoracial group. This research cohort provides a valuable resource for investigation of associations of the menopause transition with later cognitive health and disease and potential to address ethnoracial disparities in these processes. Although the present study was conducted by online self-report, participants indicated willingness to participate in future research including health interventions, neuroimaging, and biomarker collection. Future projects are planned to expand the cohort and follow up longitudinally to add more detailed assessments, explore mechanistic explanations for the associations, and develop targeted interventions to support brain health in women during the menopause transition and into older adulthood.

Sources of Funding: P30AG035982 and University of Kansas General Research Fund

P-144.

Understanding the Burden of Vasomotor Symptoms in Non-Hispanic/Latino Black or African American Women: an Initial Qualitative Analysis

Makeba Williams, MD, FACOG, MSCP[1], Mayank Ajmera, PhD[3], Aki Shiozawa, DrPH, MBA[3], Shayna Mancuso, DO, FACOG[3], Dina Elsouda, PhD[3], Michael Chladek, PhD[4], Brennah Fallon, MPH[4], Claire Mobley, MPH[4], Gloria Richard-Davis, MD, MBA, MSCP, FACOG[2]. [1]Washington University, St. Louis, MO; [2]University of Arkansas Medical Sciences, Little Rock, AR; [3]Astellas Pharma, Inc., Northbrook, IL; [4]IQVIA, Durham, NC

Objective: We sought to identify perspectives and concepts related to vasomotor symptoms (VMS) experience, treatment, and healthcare interactions to develop a hypothesis to further explore the disproportionate VMS burden experienced by Black or African American women and inform the development of a future survey on VMS.

Design: In this cross-sectional study, we identified 40–65-year-old women who identified as Black or African American and non-Hispanic/Latino experiencing VMS and living in the US. We used the following inclusion criteria to screen participants: an intact uterus and at least 1 ovary; VMS for at least the past month; menstrual cycle changes or amenorrhea in the past 12 months; the presence of night sweats or hot flashes for the past 2 weeks; and avoidance of hormone therapy for a reason other than managing VMS. We used a semi-structured interview guide to elicit women's perceptions about and experiences with menopause, including VMS and its impact on their lives; communication and interaction with healthcare providers (HCPs) related to menopause and VMS; and knowledge, experiences, and decision-making regarding VMS treatments. **Results:** We interviewed 20 Black or African American Non-Hispanic/Latino women (mean [SD] age: 54.1 [6.5] y). Four (20%) women had a history of current or past treatment for VMS. More than half of the respondents (60%) described menopause as a medical condition, and an equal proportion perceived menopause as liberating or freeing, while 25% viewed menopause as more of a hassle. In response to how others viewed them, 45% of the women felt they were seen differently by family and friends, 35% believed they were viewed as an older person even though they did not feel old; and 30% perceived no change in the way others viewed of them. Overall, 80% of the women reported VMS affected their work performance and 25% avoided social outings due to VMS. VMS disrupted the sleep of 95% of participants, and 90% reported needing to change clothes due to VMS. Fifty-five percent of the women reported irritability and mood swings. Concerning treatment, 35% of participants were unaware of FDA-approved non-hormone therapy (HT), 50% expressed concern about the side effects or long-term safety of HT, and 45% preferred no treatment. However, 75% reported incorporating dietary changes and/or exercise to help manage symptoms and 30% felt that those strategies effectively managed VMS. The majority of women (65%) felt comfortable discussing health concerns with their current HCPs; many expressed that racial (25 and gender (10%) concordance were factors when selecting ana HCP. Participants (25%) reported that their interactions with healthcare professionals were impacted by limited time and feeling rushed, limited information shared about treatment options, and HCPs not fully listening to their concerns. **Conclusion:** We aimed to identify concepts and perspectives related to VMS experience and healthcare interactions among Black or African American women. Although we conducted exploratory interviews with a limited number of participants, most women viewed menopause as a medical condition, reporting significant disruptions in sleep, work, and daily activities. However, this perception did not always translate into receiving medical treatment. While a large portion of women were comfortable discussing menopause with their HCPs, many expressed preferences for Black and/or female HCPs, potentially affecting HCP interactions. Our results identified preliminary concepts of relevance around healthcare, treatment, and VMS impact; however, ongoing deeper qualitative analysis will further inform survey development.

Sources of Funding: Astellas Pharma, Inc.

P-145.

The Day-to-Day Bidirectional Association of Sleep Features with Positive and Negative Affect in Postmenopausal Women

Shelby C. Wood, Bachelor of Arts[3], Rebecca Thurston[1], Yuefang Chang, PhD[2], Pauline Maki, PhD[4]. [1]Psychiatry, Psychology, and Epidemiology, University of Pittsburgh, Pittsburgh, PA; [2]Neurological Surgery, University of Pittsburgh, Pittsburgh, PA; [3]Psychology, University of Illinois Chicago, Chicago, IL; [4]Psychiatry, Psychology, and Obstetrics & Gynecology, University of Illinois Chicago, Chicago, IL

Objective: Postmenopausal women have an age- and menopause-related risk for sleep difficulties and shifts in positive affect (PA; engagement, energy, etc.) and negative affect (NA; anger, stress, etc.). In the general population, the temporal association between sleep and affect is bidirectional – sleep predicts next day affect and vice versa. These associations have not, however, been studied in postmenopausal women. Understanding these temporal associations between sleep and affect in postmenopausal women may advance personalized approaches to enhance well-being. Here we examine day-to-day bidirectional associations of sleep features with PA and NA in postmenopausal women. **Design:** Participants (N = 261) not using hormone therapy/SSRIs/SNRIs were enrolled in MsBrain. Participants completed 24h of vasomotor symptom (VMS) monitoring and 72h of sleep/affect monitoring at home. VMS were assessed via sternal skin conductance. Sleep features (total sleep time, TST; sleep efficiency, SE; wake after sleep onset, WASO) were assessed via wrist actigraphy. Affect was randomly assessed 4 times per day via a survey delivered on a digital device. Participants reported how strongly they currently felt each emotion (PA: energetic, interested/involved; NA: angry/irritated, nervous/anxious, stressed) and daily average PA and NA scores were calculated. Mixed-effects models were conducted to examine the lagged associations between sleep and affect. All models controlled for age, race, education, income, marital status, night shift work, sleep medication use, and anxiolytic medication use. Depressive symptoms and 24h VMS frequency were added as covariates in a hierarchical manner. **Results:** Participants included 261 postmenopausal women (mean age = 59.2 years, 80.1% White, 77.8% with VMS) with at least two concurrent days of sleep and affect monitoring. Sleep features and affect were bidirectionally associated, specifically for PA. Nightly moderate TST, higher SE, and lower WASO predicted higher next day PA (Table 1). Conversely, higher daily PA predicted shorter subsequent TST (Table 2). The addition of depressive symptoms and 24h VMS frequency as covariates did not alter results. **Conclusion:** Findings support a day-to-day bidirectional association of sleep features with PA in postmenopausal women such that more beneficial sleep features were associated with higher next day PA and higher PA predicted shorter subsequent sleep. Targeted therapies for sleep improvement may enhance daily positive emotions, while greater daily positive emotions may influence subsequent sleep. Most research in this popuplation has focused on depression, but these results highlight the importance of positive emotions on daily well-being in postmenopausal women.

Sources of Funding: This research was supported by the National Institutes of Health, National Institute on Aging (grant numbers: RF1AG053504 and R01AG053504 to Thurston and Maki).

Table 1. Nightly sleep features predicting next day affect

	Positive Affect (PA)			Negative Affect (NA)		
	Model 1 β (Std. Error)	Model 2 β (Std. Error)	Model 3 β (Std. Error)	Model 1 β (Std. Error)	Model 2 β (Std. Error)	Model 3 β (Std. Error)
Total Sleep Time (TST, Squared)	-1.491 (0.668)*	-1.523 (0.664)*	-1.530 (0.665)*	-0.203 (0.623)	-0.155 (0.615)	-0.137 (0.616)
Sleep Efficiency (SE)	0.072 (0.033)*	0.080 (0.033)*	0.080 (0.033)*	0.010 (0.030)	0.004 (0.030)	0.005 (0.030)
Wake After Sleep Onset (WASO)	-0.087 (0.031)**	-0.090 (0.030)**	-0.091 (0.030)**	-0.017 (0.028)	-0.016 (0.027)	-0.017 (0.028)

***p<.05, **p<.01;**
SE is Box-Cox transformed, WASO and NA are log transformed, all variables are z-scored;
Model 1: Adjusted for age, race, education, income, marital status, night shift work, sleep medication use, anxiolytic medication use;
Model 2: Model 1 covariates + depressive symptoms;
Model 3: Model 2 covariates + 24h VMS frequency

Table 2. Daily affect predicting subsequent nighttime sleep

	Total Sleep Time (TST)			Sleep Efficiency (SE)			Wake After Sleep Onset (WASO)		
	Model 1 β (Std. Error)	Model 2 β (Std. Error)	Model 3 β (Std. Error)	Model 1 β (Std. Error)	Model 2 β (Std. Error)	Model 3 β (Std. Error)	Model 1 β (Std. Error)	Model 2 β (Std. Error)	Model 3 β (Std. Error)
Positive Affect (PA)	-0.134 (0.039)**	-0.133 (0.042)**	-0.134 (0.042)**	0.021 (0.039)	0.036 (0.041)	0.033 (0.041)	-0.069 (0.042)	-0.073 (0.045)	-0.071 (0.045)
Negative Affect (NA)	0.059 (0.040)	0.047 (0.044)	0.049 (0.045)	-0.003 (0.040)	-0.020 (0.044)	-0.014 (0.044)	-0.007 (0.043)	-0.017 (0.048)	-0.023 (0.048)

***p<.05, **p<.01;**
SE is Box-Cox transformed, WASO and NA are log transformed, all variables are z-scored;
Model 1: Adjusted for age, race, education, income, marital status, night shift work, sleep medication use, anxiolytic medication use;
Model 2: Model 1 covariates + depressive symptoms;
Model 3: Model 2 covariates + 24h VMS frequency

P-146.

Extracellular Microvesicle Populations, Perimenopausal Hot Flashes and Physical Activity: Implications for Cardiovascular Health

Celeste Keep, BS[2], Megan Holm, MS[1], Justine Wagaman, BA[3], TInt Tha Ra Wun, BA[4], Lorna Murphy, MS[1], Sarah Witkowski, PhD[1]. [1]Exercise & Sport Studies, Smith College, Northampton, MA; [2]Mt. Holyoke College, South Hadley, MA; [3]Department of Chemistry, Smith College, Northampton, MA; [4]Biological Sciences, Smith College, Northampton, MA

Objective: Hot flashes (HF) have been associated with greater risk for cardiovascular disease. Higher HF frequency and intensity have been associated with worse vascular endothelial health, particularly in perimenopausal people. Physical activity (PA) is recognized as a factor that is beneficial to endothelial health in many populations and preliminary data from our lab shows that higher amounts of physical activity can ameliorate the negative relationship between HF and endothelial function. However, the mechanisms underlying the connection between HF and endothelial dysfunction and the role of PA remain elusive. Endothelial extracellular microvesicles (EMV) are released into the blood from endothelial cells and carry markers of the parent cells and may therefore provide important information about the status of the endothelium. Our objective was to evaluate whether objectively measured HF and PA are associated with

endothelial extracellular microvesicle populations in perimenopausal people. **Design:** Healthy, non-smoking perimenopausal participants aged 43-54 were recruited according to the STRAW+10 criteria. Participants had normal blood pressure, cholesterol and fasting glucose, BMI >18.5kg/m^2 or ≤ 35kg/m^2, and could not have used hormone therapy or oral contraceptives in the past 6 months. Participants were instrumented with a Biolog monitor to measure hot flashes over 24 hours using sternal skin conductance (SSC). Hot flashes were defined as a rise in SSC of 2 μmhos over 30 seconds and/or or a distinctive HF pattern (rapid rise followed by a slow descent) when accompanied by a subjective indication of a HF (Flash Trax v 2.1, UFI, Morrow Bay CA). Participants wore an ActiGraph GT3X accelerometer for 7 days on the non-dominant wrist as a measure of habitual PA. The average amount of moderate to vigorous physical activity (MVPA) was determined using the GGIR R package (version 2.9-0) and Hildebrand (2014) PA cutpoints. Venous blood was drawn from participants in the morning when they were fasted for at least 6 hours, avoided alcohol for 12 hours and refrained from exercise for 24 hours. Endothelial microvesicles were measured from cell free plasma using imaging flow cytometry (Amnis MKII) and analyzed with IDEAS 6.2 software. $CD62e^+$ EMV were measured to assess endothelial activation and $CD31^+/CD42b^-$ were measured to assess endothelial apoptosis. Microvesicles included particles within the 100-900nm range. Unstained EMV, antibody only and filtered PBS were included as controls. Data are presented as the percentage of each EMV population divided by the number of total 100-900μm particles. Data were evaluated for correlations between each of the two EMV populations, objective HF rate, MVPA (min/day), age and BMI. Multivariate regression modeling was performed to determine predictors of each EMV population. **Results:** EMV data was collected from 55 participants. Participants were 49±3 years of age and had an average of 87±37 minutes of MVPA/day. Significant correlations were not found for either EMV population when all participants were considered. When only participants symptomatic for HF were included (≥1 objective HF in 24 hours, n=31), a significant correlation was found between activated EMVs ($CD62e^+$) and MVPA ($r=-0.42$, $p<0.05$). No significant correlations were found between either EMV population and HF rate. Multivariate regression modeling showed that MVPA was a significant predictor of activated EMV ($CD62e^+$) alone ($\beta=-0.1449$, $p=0.02$ adj $R^2=0.1455$, $F(1,29)=6.108$, $p=0.02$). A model adjusting for age and BMI improved the model slightly, ($\beta=-0.1343$, $p=0.05$; adj $R^2=0.161$, $F(3,27)=2.919$, $p=0.05$. Adding HF rate did not improve the model ($\beta=-0.1352$, $p=0.04$; adj $R^2=0.129$, $F(4,26)=2.11$, $p=0.11$). **Conclusion:** These data show that higher amounts of MVPA are related to lower levels of endothelial activation in perimenopausal people who are symptomatic for hot flashes. For perimenopausal people, engaging in MVPA may reduce the subclinical CVD risk associated with hot flashes through reducing endothelial activation.

Sources of Funding: NIH NHLBI R15 Grant1R15HL145650-01A1 (Witkowski).

P-147.

Impact of an Online Ambulatory Educational Module on Menopause Knowledge Among Internal Medicine Residents

Christiana Zhang, MD[1], Talia Sobel[2], Amanda Bertram[1], Rosalyn Stewart[1], Stephen Sisson[1]. [1]Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD; [2]Women's Health Internal Medicine, Mayo Clinic Arizona, Scottsdale, AZ

Objective: In the U.S., 1.3 million women enter menopause annually. While the life expectancy for U.S. women has increased steadily over the past decades, the average age of menopause has remained at 51 years of age. As a result, U.S. women may now spend a third of their lives in menopause. Furthermore, the menopause transition is accompanied by physical, cognitive, emotional, and sexual changes that significantly impact women's quality of life, well-being, health care utilization, and function at home and in the workplace. It is therefore crucial that patients receive informed, thoughtful medical guidance and counseling on the diagnosis and management of menopausal symptoms from their health care providers. Unfortunately, surveys assessing menopause education show that during training, medical trainees have limited didactic and clinical exposure to menopause. Kling et al's 2019 study showed that 93.2% of residents representing 20 U.S. residency programs (including internal medicine, family medicine, and obstetrics and gynecology) did not feel adequately prepared to manage menopausal symptoms. To address this educational gap, we evaluated the effectiveness of an online ambulatory educational module on improving menopause knowledge among internal medicine (IM) residents between July 2023 and March 2024. **Design:** The online ambulatory educational module on menopause was delivered through the Johns Hopkins Physician Education and Assessment Center (PEAC). The module content focused on recognition of menopause, including definition, clinical presentation, and hormonal changes; hormone therapy for treatment of menopausal symptoms; risks associated with hormone therapy; hormone therapy and cardiovascular disease; and non-hormonal treatments for management of menopausal symptoms. Data was extracted from all those who completed the PEAC Menopause module from 2023 to 2024, including 259 programs across 7 countries. The primary outcome was the change in menopause knowledge before and after module completion. The secondary outcome was the difference in menopause knowledge by level of IM resident. For this abstract, we included internal medicine residents who were post-graduate year (PGY) 1 through 3. Descriptive statistics and pre/post-test comparisons were used for data analysis. The Johns Hopkins Institutional Review Board reviewed and approved this study. **Results:** A total of 1003 users completed the Menopause PEAC module from 2023 to 2024. The average total pre-test score was 40.01% (out of 100%) for all users. When analyzed by level of IM resident, the average pre-test score was consistently low across all IM resident levels: PGY1 average score was 39.62% (n=279), PGY2 average score was 39.47% (n=297), and PGY3 average score was 40.13% (n=378). Users scored lowest on pre-test questions about the definition and physiology of menopause and non-hormonal treatment options for vasomotor symptoms of menopause. For all users, there was a clinically significant improvement in post-test knowledge across all domains. The average total post-test score was 75.47%. Post-test scores remained consistent across all IM resident levels: PGY1 average score was 75.19%, PGY2 average score was 74.84%, and PGY3 average score was 76.29%. In the post-test, users scored lowest on questions about indications and risks of hormone therapy. **Conclusion:** To our knowledge, our study is one of the first to evaluate baseline menopause knowledge in IM trainees internationally and highlighted a clear educational gap. All levels of IM residents had very low baseline knowledge regarding the diagnosis of menopause and the management of menopausal symptoms. It is notable that PGY3 residents did not score significantly higher than PGY1 or PGY2 residents on the pre-test. This study demonstrated the effectiveness of an online module in improving menopause knowledge across all levels of learners. Given the important role that providers play in identifying and managing menopausal patients, we believe that an online, asynchronous e-learning module can be an effective educational method. Further efforts are necessary to educate internists and other providers so they are better prepared to care for women through the menopause transition.

Sources of Funding: None