



Research, Interventions and Equitable Care Updates in Premenstrual and Perimenopausal Women: A Focus on Improving Mental Health

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Presenters

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CAPT Paulette Cazares, M.D., M.P.H., US Navy



Navy Capt. Paulette Cazares, M.D., M.P.H. attended Boston College for her undergraduate studies. She was commissioned to attend Uniformed Services University of the Health Sciences (USUHS) and graduated in 2004. She completed a Psychiatry Internship at Naval Medical Center San Diego (NMCS) in 2005 and then served as the General Medical Officer (GMO) onboard the USS Pearl Harbor (LSD-52) from 2005-2007. Following this operational tour, she completed training in Psychiatry via the National Capital Consortium Psychiatry Residency Program. During that time, she served as the Navy Chief Resident and completed a M.P.H. at Drexel University.

Her staff tours have included Naval Hospital Camp Lejeune (NHCL), two tours at Naval Medical Center San Diego, and an overseas tour as the Director for Mental Health (DMH) at Naval Medicine Readiness and Training Command (NMRTC) Okinawa (2020-2023). During her tour at NHCL, she deployed as the Joint Task Force psychiatrist to Guantanamo Bay, Cuba, to serve as the Psychiatrist for the Joint Medical Group. At NMCS, she served as the command's Women's Mental Health SME, and as the Associate DMH. She piloted the Department of Defense's 1st Women's Mental Health program, and ultimately led the formal creation of the Women's Mental Health sub-community, under the Clinical Community umbrella at BUMED, which has since evolved into the Female Force Readiness Clinical Community (FFRCC), where she served as the inaugural Chair. During her time as Chair, she led creation of the Comprehensive Women's Health Clinic pilot, the first of its kind within the DoD, to focus multi-disciplinary care on the needs of active-duty servicewomen.

She is in her 2nd term on the Executive Board for the American Medical Women's Association. In her current role, she serves as faculty at Navy Medicine Readiness and Training Command San Diego and at Family Health Centers of San Diego. She works clinically in the inpatient and outpatient environments. She is engaged in research and continues to serve in the FFRCC. She is the current Co-Chair for the 2024 Female Physician Leadership course.



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Laura J. Miller, M.D.



Dr. Miller directs the Veterans Affairs Reproductive Mental Health Consultation Program and training course in the Office of Mental Health and Suicide Prevention.

She is a Professor of Psychiatry at Loyola Stritch School of Medicine and has developed nationally award-winning women's mental health services and educational programs.

Dr. Miller participated in numerous women's mental health policy initiatives and has authored or co-authored more than 90 articles and book chapters related to women's mental health.



Disclosures

- CAPT Paulette Cazares is on the Executive Board for AMWA (non-financial) and is a researcher at Sharp Neurocognitive Research Center, San Diego, CA (financial).
- Dr. Laura Miller has no relevant financial or non-financial relationships to disclose relating to the content of this activity.
- The views expressed in this presentation are those of the author and do not necessarily reflect the official policy or position of the Department of Defense nor the U.S. Government.
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Learning Objectives

At the conclusion of this activity, participants will be able to:

1. Describe treatment options for premenstrual dysphoric disorder (PMDD).
2. Identify three contributory risk factors associated with perimenopausal depression.
3. List three interventions for treating perimenopausal depression.
4. Discuss the role of bias in the recognition and treatment of both PMDD and perimenopausal mental health symptom clusters/illnesses.
5. Summarize the epidemiology and symptoms of premenstrual syndrome (PMS), PMDD, and premenstrual exacerbation (PME).



What is Women's Health?

Aspects of medicine in which the patient's sex/gender role is identified, and considered in the etiology, course, and treatment of illness and disease.



Women's Health, Defined

- LONG Time: Women's Health = vagina, cervix, uterus, ovaries, breast
 - Dual sex-based medicine: everything else
- Sex/Gender affects every aspect of medicine
 - Cardiology, Neurology, Orthopedics, etc.
- Gender based roles affect disease rates & expression of disease



Terminology Used in Most Research

Sex – biologically based



Gender – culturally based
(with or without biological influence)

Limitations

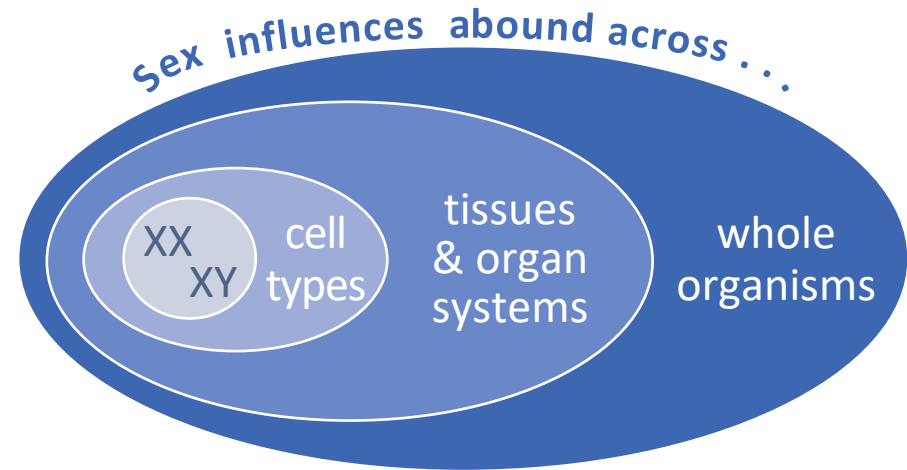
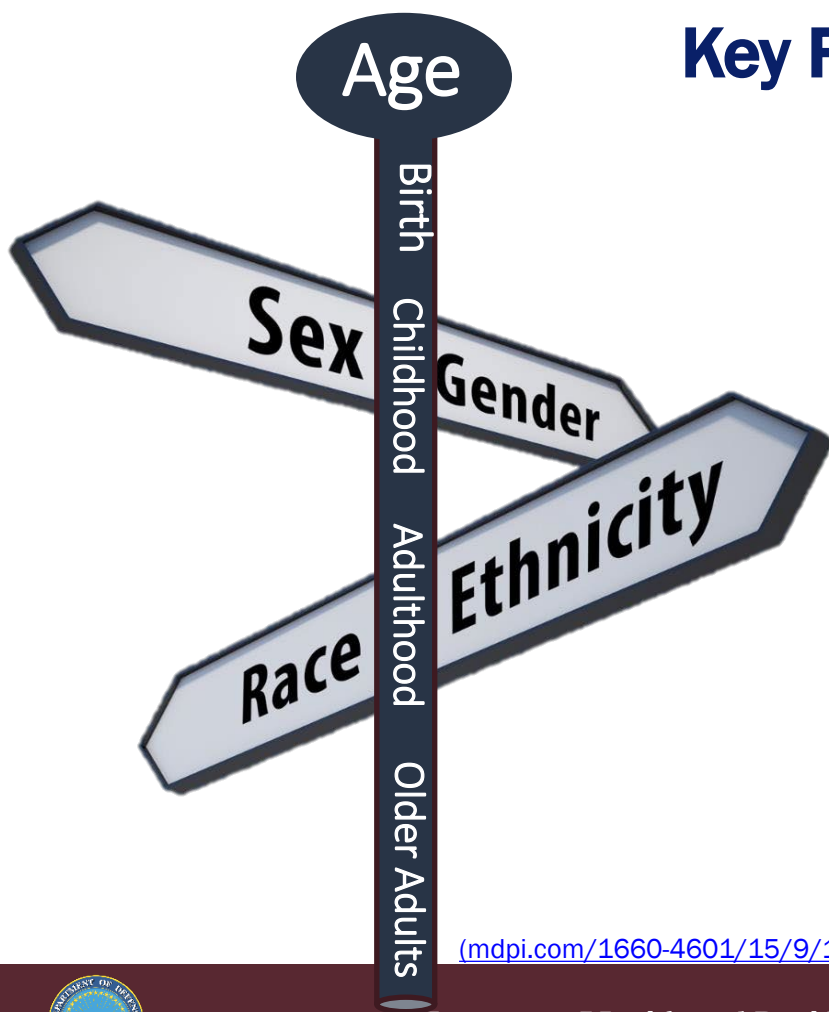
- SIGNIFICANT prior research with absence of female cells/mice/subjects
- Many studies assume a gender binary
- Most studies do not differentiate between sex and gender



<https://www.wsiu.org/education/2021>



Key Factors Intersect with Health & Disease



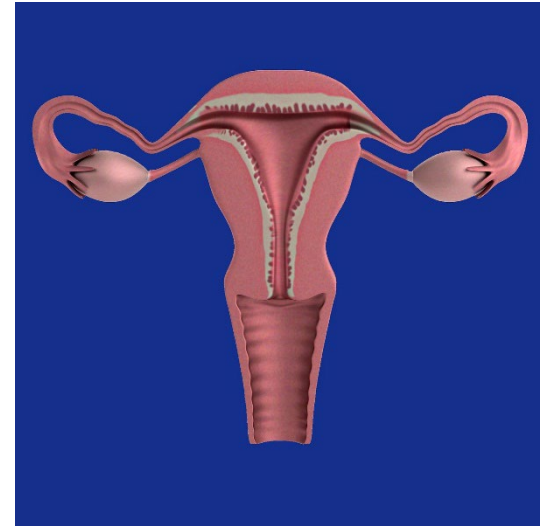
(mdpi.com/1660-4601/15/9/1796, n.d.)

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Menstrual Cycle: Functional Description

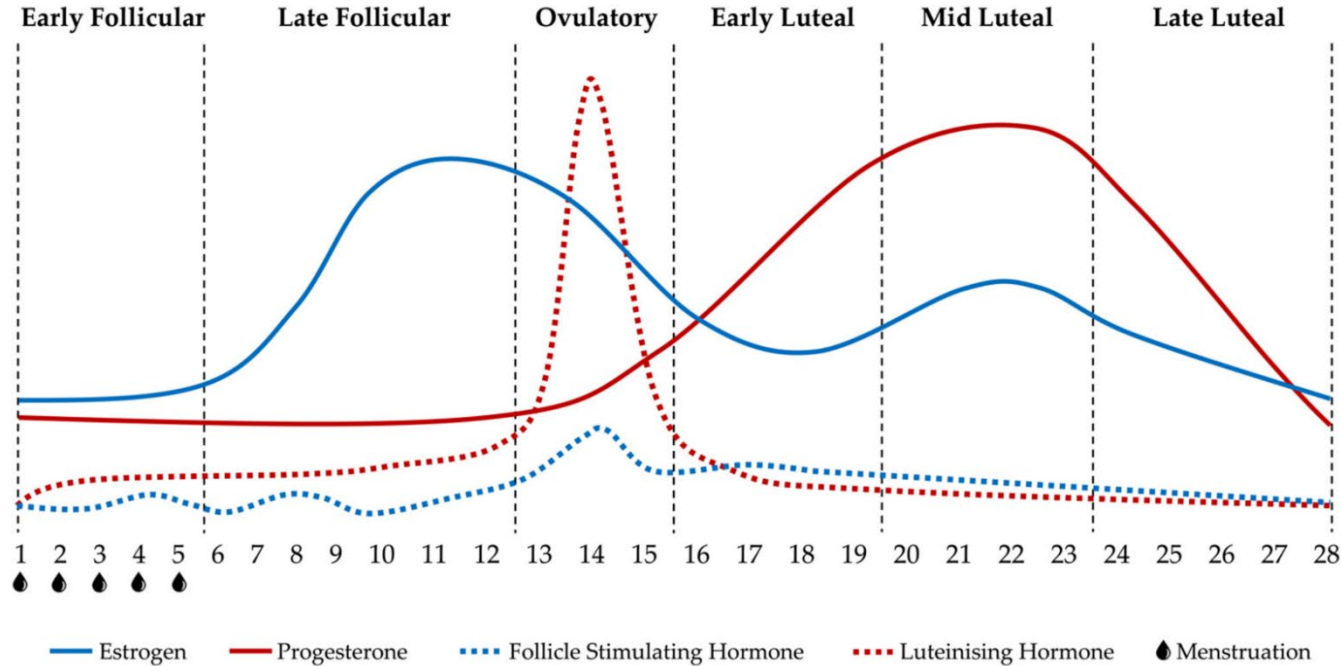
- The menstrual cycle starts on the first day of bleeding
- During this phase, estrogen is the dominant hormone
 - Builds the endometrial lining
- After ovulation, progesterone becomes the dominant hormone
 - Stabilizes the endometrial lining
- If there's no pregnancy, progesterone levels fall a few days before menstruation
 - The endometrial lining sheds



(<https://www.coastalfertilityspecialists.com>)



Menstrual Cycle Phases



(Carmichael et al., 2021)



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Carmichael et al., 2021



Case Example

Premenstrual Symptoms

Boatswain's Mate 2nd Class (BM2) Maravillosa is a 26-year-old active-duty (AD) single female assigned to USS Always Deploys. She used continuous contraceptives to suppress menstruation while deployed and discontinued them when her ship went into dry dock.

Since, she has had recurring stretches of several days when she cries easily, feels she's failing at everything, can't tolerate imperfection, screams a lot and wants to be alone. During those days, she craves sweet foods and her joints hurt.

BM2 didn't link this to menstrual periods, but during some amazing general medical training (GMT), her well-trained general medical officer (GMO) educated the crew that there are times menstrual patterns align to mood, and she decided to seek treatment.



Audience Poll Question

What are some possible diagnoses you would consider?

- a. Normal “Hormonal stuff”
- b. Nothing, she should suck it up
- c. Mood changes due to menstrual cramps
- d. PMDD



Premenstrual Dysphoric Disorder (PMDD)

Symptoms include one or more of these....

- **Mood lability***
- **Irritability, anger***
- Depressed mood, hopelessness
- Anxiety, tension

***Most common**

... and some of these, to total at least five

- Decreased interest
- Subjective concentration impairment
- Lethargy, reduced energy
- Change in appetite
- Sleep disturbance
- Feeling overwhelmed
- Physical symptoms

(American Psychiatric Association, 2022)
(Hantsoo & Epperson, 2015)



PMDD: Definition and Prevalence

- ≥ 5 symptoms during last week of luteal phase
- Begins to remit within a few days after onset of menstrual bleeding
- Minimal or absent in the week after the menstrual period
- Happens in all or most menstrual cycles
- Confirmed by prospective symptom ratings across at least two cycles
- Causes marked distress and/or interferes with functioning
- Experienced by 2 – 8% of menstruating women

(APA, 2022; Gao et al., 2022; Halbreich et al., 2003)



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Premenstrual Syndrome (PMS)

- Not in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5)
- Present in the International Classification of Diseases (ICD) as premenstrual tension syndrome
- Researchers often define it as subsyndromal PMDD
- Experienced by 20 – 40% of menstruating women



<https://collegepark.iusd.org/department/parents>



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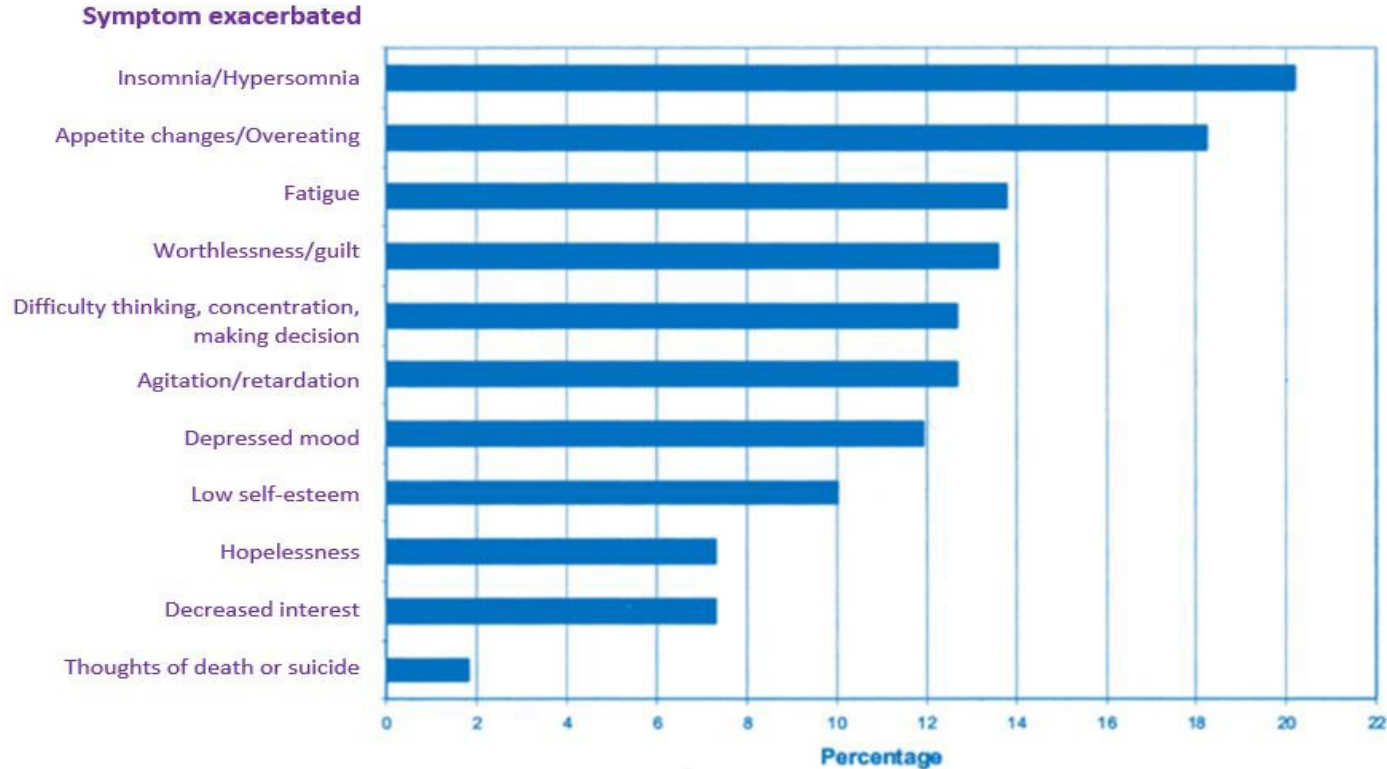
Premenstrual Exacerbation (PME)

- A health condition that regularly intensifies in the late luteal phase of the menstrual cycle
- Includes medical conditions such as migraines, asthma, epilepsy
- Among mental health conditions, includes:
 - Depression
 - Panic disorder
 - Eating disorders
 - Psychotic disorders
 - Borderline personality disorder

(Nolan & Hughes, 2022; Pinkerton et al., 2010)



Premenstrual Exacerbation of Depression



(Hartlage et al., 2004)



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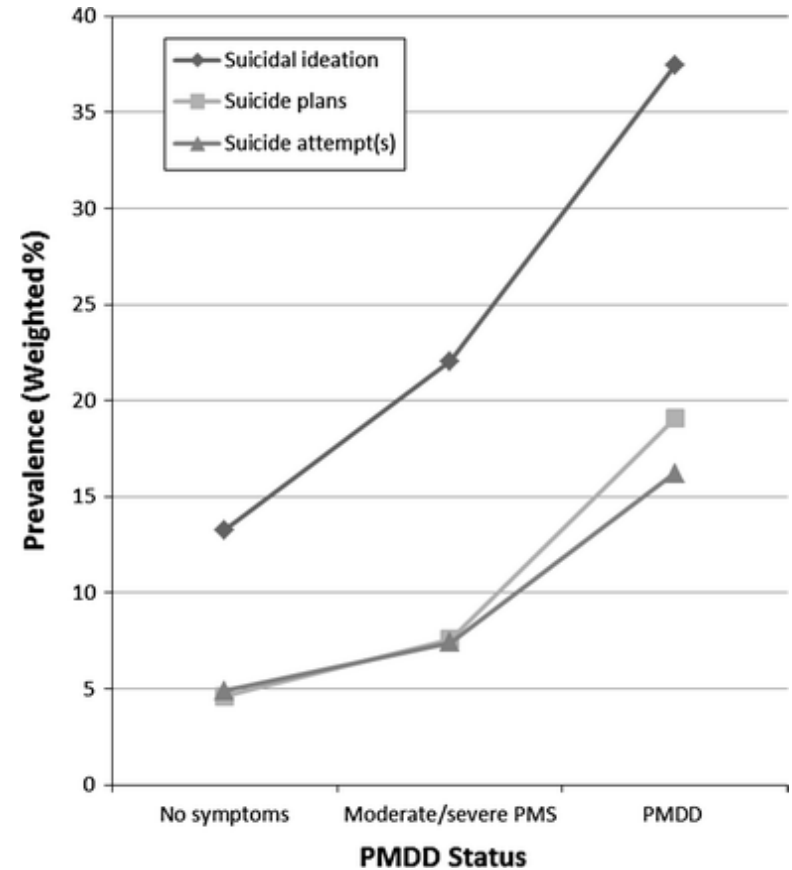
Premenstrual Screening and Assessment Tools

- Daily Record of Severity of Problems (DRSP)
 - Gold standard for diagnosing PMDD
 - Requires patient rating over two consecutive menstrual cycles
 - Impractical in some circumstances
- Premenstrual Symptoms Screening Tool (PSST)
 - Retrospective
 - Completed during the clinical encounter
 - Relatively high sensitivity (79%) but low specificity (33.3%) for PMDD diagnosis

(Endicott et al., 2006; Henz et al., 2018; Steiner et al., 2003)



PMDD is associated with increased suicidal thoughts, plans and attempts



(Pilver et al., 2013; Prasad et al., 2021; Yan et al., 2021)



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PMDD and stress response

In the luteal phase, women with PMDD have increased subjective and behavioral response to stress



(Beddig et al., 2019; Epperson et al., 2007)



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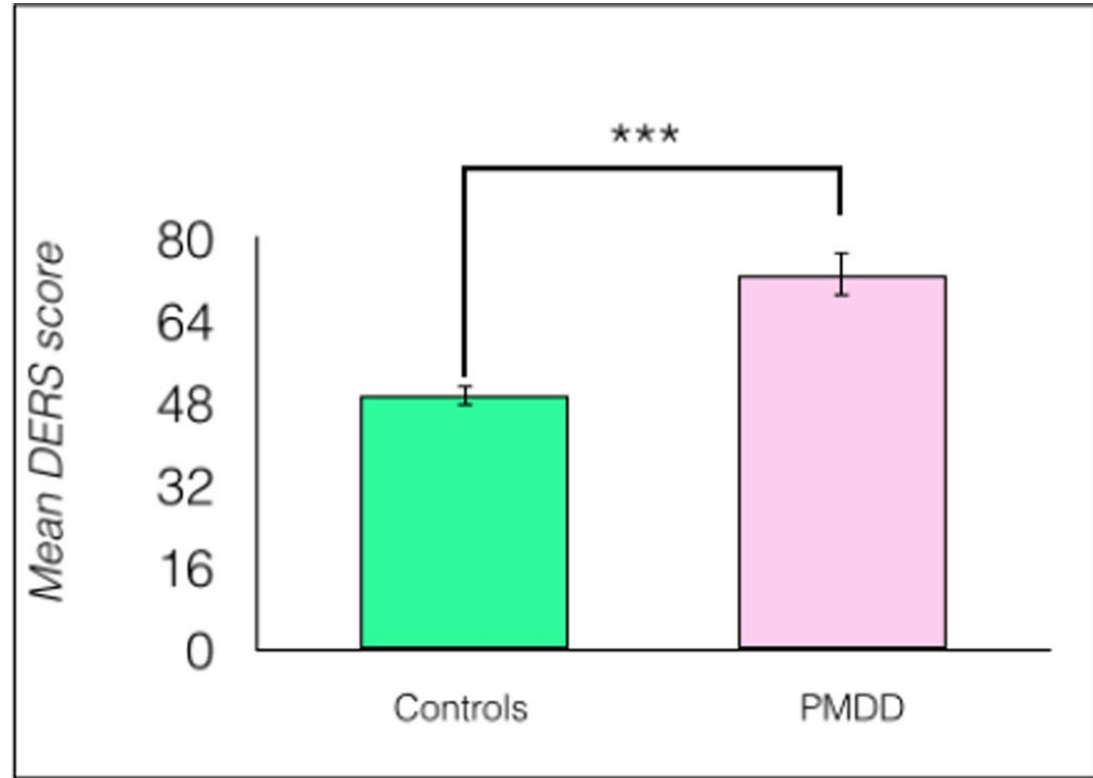


PMDD and Emotion Regulation

Women with PMDD have

- More difficulty regulating emotions than those without PMDD
- Reduced top-down control of limbic activity on functional brain imaging

Difficulties in Emotion Regulation Scale (DERS) ²³



(Dubol et al., 2020; Eggert et al., 2016; Petersen et al., 2016; Protopopescu et al., 2008)



Other Premenstrual Trackers

- Phone apps**
 - Convenient; Not yet validated
- Digital or paper calendars
 - Single-item visual analogue 😊 ☹️
- Individualized charts
 - Veteran chooses which symptoms to track
 - Can be adapted to their cycle length
 - Especially helpful for PME
 - Can be used not only for diagnosis but for assessing response to treatment

****Data Security
Cannot be Guaranteed**



Considerations for Diagnosis

- NMCS D: No PMDD Limited Duty (LIMDU) in leaders' memories in years
- 15 Navy Physical Evaluation Board (PEBs) since data set from 1999 (2 Fit)
- Army: Wouldn't qualify for PEBs per Army Regulations (AR 40-501)
- Considerations:
 - ICD-10 added PMDD recently.
 - ICD-9's closest diagnosis: 625.4 "Premenstrual Tension Syndrome"
 - Occupationally impairing PMDD might have been submitted under Unspecified Depressive Disorder, Unspecified Mood Disorder, etc.
 - AD diagnoses are often 'scrambled' in the PEB process into Veterans Affairs Schedule Rating Disabilities (VASRD) diagnostic codes
 - PEB process makes more diagnoses a difficult/slowing process, although more accurate

(American Psychiatric Association, 2022)



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Audience Poll Question

BM2 is referred by her General Medical Officer (GMO) to Psychiatry, and describes her symptom to her new psychiatrist, Dr. Cazares, who diagnoses PMDD.

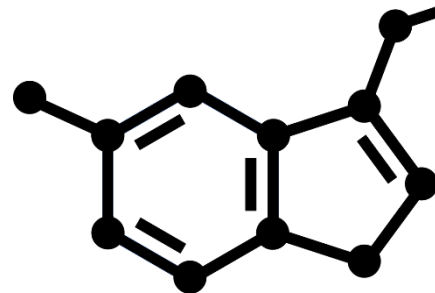
What treatments could Dr. Cazares recommend for Alisha?

- a. Ibuprofen
- b. SSRIs
- c. Contraception
- d. Hysterectomy



PMDD: Antidepressant Efficacy

- First-line treatment is a serotonergic antidepressant
- Among Selective Serotonin Reuptake Inhibitors (SSRIs), Food and Drug Administration (FDA) - approved ones for this use include
 - Fluoxetine
 - Sertraline
 - Paroxetine
- Venlafaxine, a Serotonin-Norepinephrine Reuptake Inhibitor (SNRI), is also effective
- Venlafaxine and other SSRIs are sometimes used off label



(Freeman et al., 2001; Hantsoo & Epperson, 2015; Lanza di Scalea & Pearlstein, 2015)



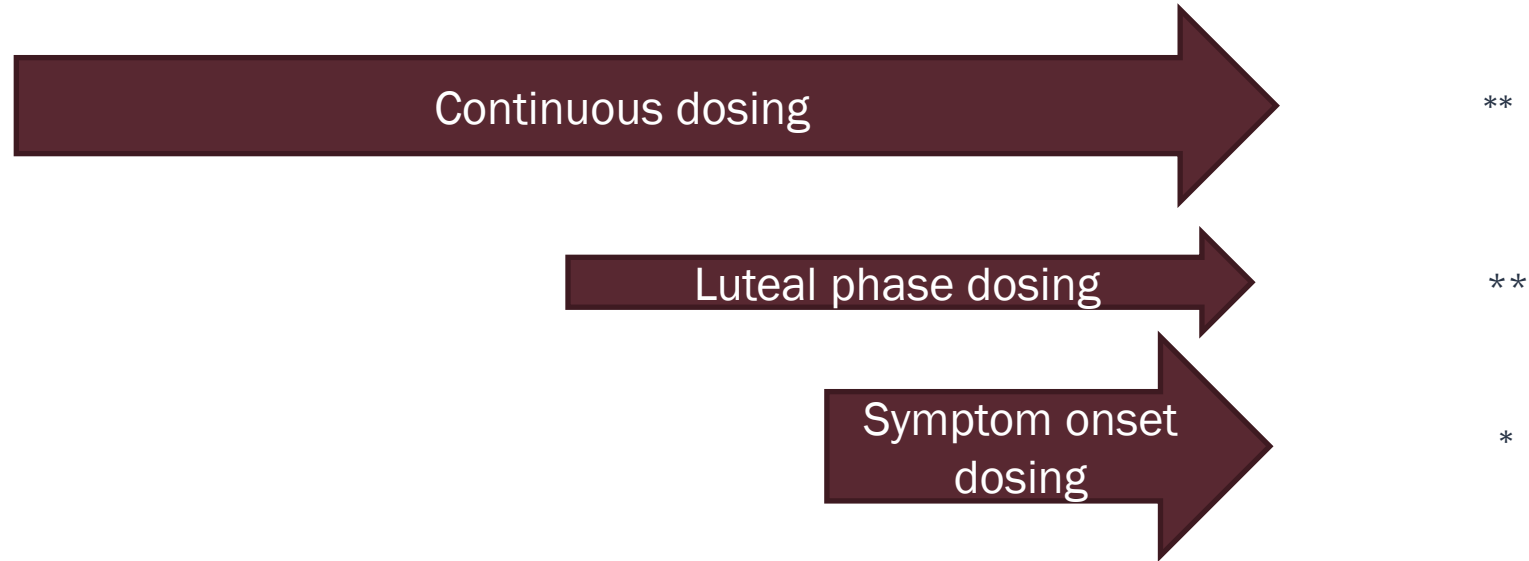
Audience Poll Question

BM2 is willing to consider an antidepressant but is reluctant to take it every day, since her symptoms only last about a week each month. She asks Dr. Cazares if she can just take the medication towards the end of her period. Would that work?

1. Yes
2. No
3. I'm not sure



Dosing Strategies for PMDD

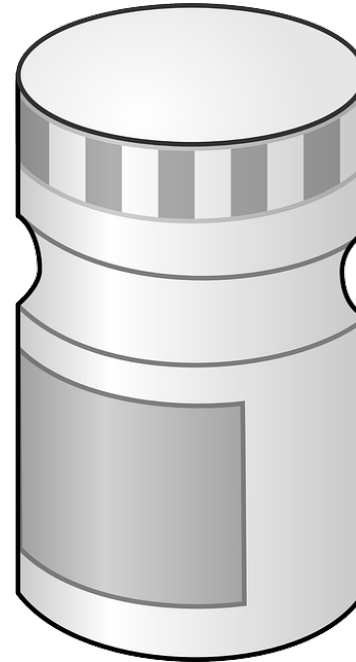


** Robust Efficacy Data; * Some Efficacy Data

Non-Serotonergic Antidepressants are Ineffective for PMDD

Examples

- Bupropion
- Desipramine
- Maprotiline



(Eriksson et al., 1995; Freeman et al., 1999; Pearlstein et al., 1997)



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Audience Poll Question

BM2 likes the idea of luteal phase dosing but is still hesitant to take an antidepressant. She asks if she could go back to suppressing menstruation with continuous contraceptives like she did on active duty, since PMDD seems like a hormonal condition. She feels contraceptives would be less stigmatizing than antidepressants.

How should Dr. Cazares respond?

- a. Acknowledge the patient's wise question
- b. Discuss the limited effectiveness of OCPs for this condition
- c. Check her countertransference about the patient's perceived avoidance of antidepressants as a treatment option
- d. Discuss the non-impact to her career to taking an antidepressant
- e. Ask if she has additional questions/concerns
- f. All of the above



Hormonal Contraceptives and PMDD

- Drospirenone (progestin)/ethinyl estradiol 24/4 (DRSP/EE)
 - The only contraceptive that is:
 - ✓ Shown to be significantly more effective than placebo
 - ✓ FDA-approved for PMDD
 - Common side effects: nausea, intermenstrual bleeding, breast pain (nausea and breast pain usually resolve after 2 – 3 cycles)
 - FDA warning: Higher risk of venous thromboembolism than oral contraceptives (OCs) containing levonorgestrel or other progestins (applies only to new users; small increased risk over other oral contraceptives; absolute risk low)
- Continuous hormonal contraceptives not consistently effective for PMDD, with no demonstrated advantage over intermittent DRSP/EE



PMDD: Other Interventions (Less Well Studied)

- Hysterectomy with bilateral oophorectomy (removal of ovaries)
 - Used when another indication for hysterectomy is present
- Vitex Agnus Castus Extract (VACE) (chaste tree berry)
 - As with other herbal remedies, what is sold lacks quality control
- Exercise
 - Shows efficacy for premenstrual anxiety, anger, pain, constipation
- Cognitive-Behavioral Therapy (CBT)
 - Effective when focused on active coping and stress management
- Calcium supplements (500 – 1000 mg daily)
- Acupuncture or acupressure

(Arab et al., 2020; Armour et al., 2018; Cronje et al., 2004; Csupor et al., 2019; Lanza di Scalea & Pearlstein 2015; Reid, 2012; Saglam & Orsal, 2020; Shobeiri et al., 2017; Verkaik et al., 2017; Weise et al., 2019)



What About PME?

- Use psychotropics that treat the underlying disorder
- Dosing considerations:
 - Increase the continuous dose to be therapeutic throughout the cycle, including the more symptomatic premenstrual phase
 - Boost the dose higher in the luteal phase (not well studied)
- No studies of psychotherapy for PME



(Kuehner & Nayman, 2021)



Summary: Menstruation and Mental Health

- Premenstrual mental health conditions include PMDD, PMS, and PME
- Serotonergic antidepressants are first line treatment, with continuous, luteal phase, or possibly symptom-onset dosing
- Other interventions include
 - DRSP/EE 24/4
 - Calcium supplementation
 - Aerobic exercise
 - CBT
 - Gonadotropin Releasing Hormone (GnRH) agonists
 - Hysterectomy with bilateral oophorectomy
 - Vitex agnus castus extract
 - Acupuncture or acupressure





Perimenopausal Mental Health

Laura J. Miller, M.D.

Medical Director of Reproductive Mental Health
Women's Mental Health, Office of Mental Health and Suicide
Prevention, VHA

Case Example



(<https://www.medicalnewstoday.com/articles/stress-and-insomnia-linked-to-atrial-fibrillation-after-menopause>)

Sharmaine is a 52-year-old woman who retired from the Air Force eight months ago to care for her husband. He died of cancer two months ago. Lately Sharmaine has felt sad, sluggish, lonely and without purpose. She used to rely on vigorous exercise to lift her spirits, but she has arthritis and no longer does that. She's exhausted because sweats awaken her several times per night. She starts to think there's no point in continuing to live. That thought scares her, so she comes to the VA for an evaluation.



What is Perimenopause?

- Transition to menopause, during which ovarian hormone levels fluctuate
- Starts when menstrual cycles become more irregular
- Ends 12 months after last menstrual cycle
- Symptoms typically lasts 4–8 years, but can be longer



(<https://www.neveradullmoment.org>)

(Maki et al., 2019; Paramsothy et al., 2017; Santoro et al., 2021)



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Perimenopause and Mental Health

- Compared to pre-menopause, women in perimenopause are twice as likely to have depressive symptoms, and symptoms are more severe on average
- Women with pre-existing anxiety or PTSD tend to have higher symptom severity in perimenopause
- Suicidal ideation prevalence in a large epidemiologic study
 - Pre-menopausal women: 1.1%
 - Perimenopausal women: 7.8%
 - Post-menopausal women: 1.0%
 - Middle-aged men: 1.0%

(Michopoulos et al.,2023; Soares, 2023; Usall et al., 2009)



Audience Poll Question

If you suspect perimenopause, would you measure Sharmaine's hormone levels?

1. Yes, I would measure estrogen, progesterone, FSH and LH levels
2. Yes, I would measure hormone levels, but different ones
3. No, I wouldn't measure hormone levels
4. I'm not sure



How to Assess for Perimenopause?

- Asking about symptoms is more reliable than measuring hormones
- Most common symptoms
 - Irregular menses
 - Vasomotor symptoms
 - Hot flashes
 - Night sweats
 - Sleep disturbance
 - Vaginal and urogenital changes – e.g., vaginal dryness



[\(https://med.emory.edu/\)](https://med.emory.edu/)

(Maki et al., 2019; Santoro et al., 2021)



Case Example

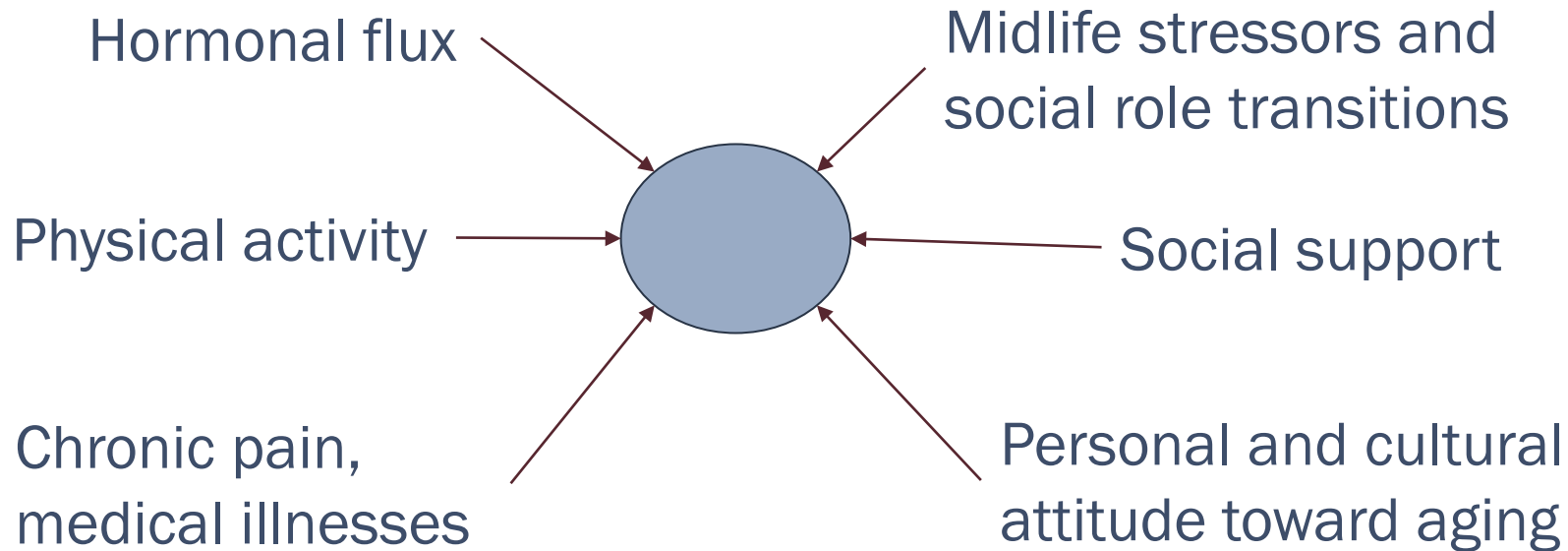
Due to Sharmaine's age and her mention of night sweats, her VA psychiatrist asks about perimenopausal symptoms. Sharmaine reports that her menstrual periods have become irregular, heavier and farther apart. She has hot flashes and night sweats several times a day. She's not sexually active now, but before her husband died, she found intercourse painful due to vaginal dryness and had reduced sexual desire.



(<https://www.medicalnewstoday.com/articles/stress-and-insomnia-linked-to-atrial-fibrillation-after-menopause>)



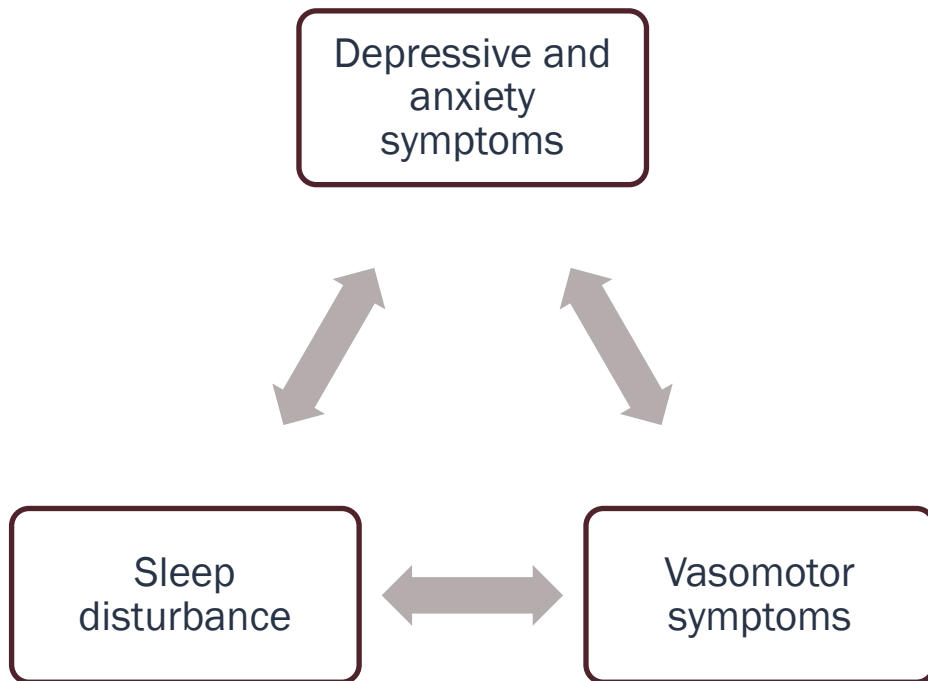
Influences on Perimenopausal Mental Health



(Gan et al., 2023; Maki et al., 2019; Soares, 2023; Woods et al., 2022)



Targeting Interacting Symptoms Improves Outcomes



(Maki et al., 2019; Zhou et al., 2021)



Vasomotor Symptoms (VMS)

- Up to 80% of perimenopausal women experience VMS (hot flashes, night sweats) during perimenopause
- Mean frequency 4–5 per day; some have up to 20 per day
- Mean duration 7.4 years; some experience them much longer
- Depression, anxiety, cigarette smoking, and obesity are associated with greater VMS severity
- The effect of VMS on quality of life is more intense among women Veterans than among women non-Veterans

(Anderson et al., 2020; Avis et al., 2015; Avis et al., 2018; El Khoudary et al., 2019; Katon et al., 2016; Khan et al., 2023; Soares, 2023)



Pharmacotherapy for VMS

FDA-approved for VMS

- Estrogen
- Paroxetine (7.5 mg daily)
- Fezolinetant

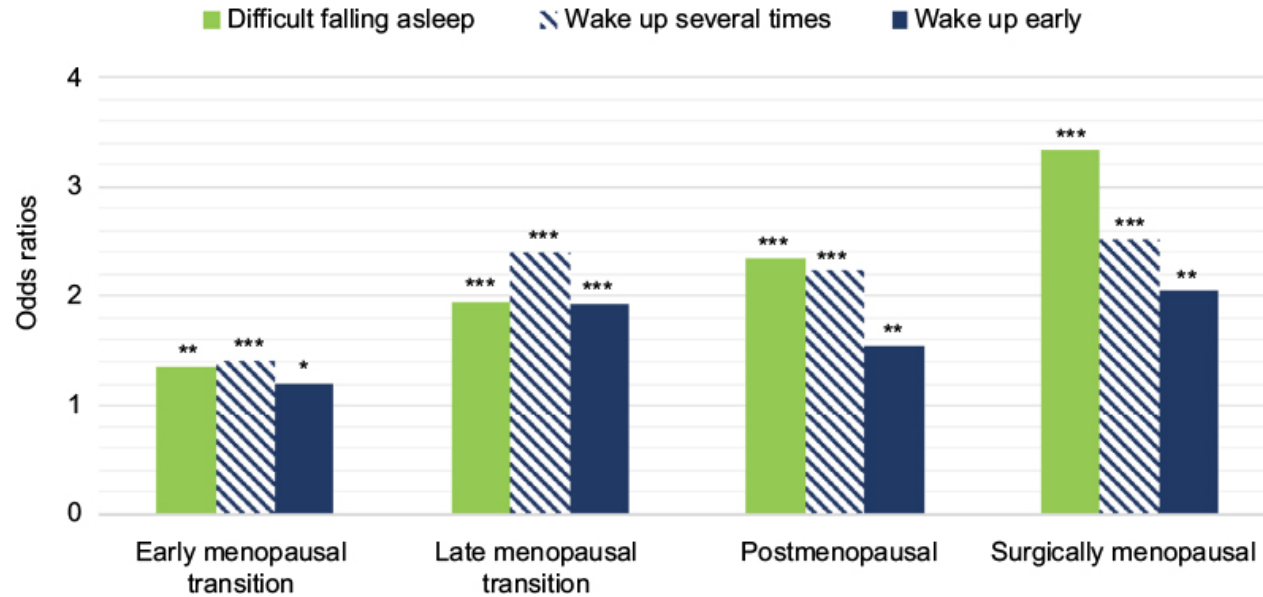
Other effective medications

- Antidepressants
 - best evidence for citalopram, escitalopram, venlafaxine, desvenlafaxine
- Gabapentin and pregabalin
 - gabapentin better studied
- Oxybutynin
 - helpful with comorbid overactive bladder
 - has anticholinergic side effects
- Clonidine
 - less effective than others

(Khan et al 2023)



Sleep Difficulties and the Menopausal Transition



* $P < 0.05$;
 ** $P < 0.01$;
 *** $P < 0.001$

(Kravitz & Joffe, 2011; Baker et al., 2018)



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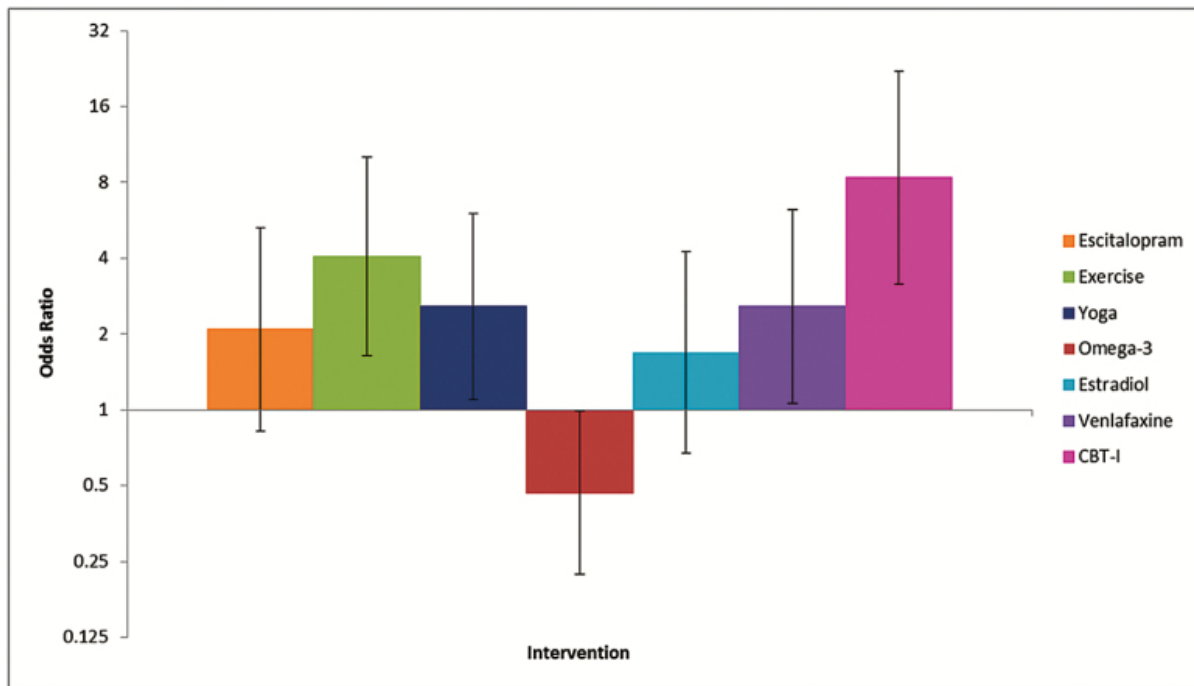
Contributors to Sleep Difficulties in Perimenopause

- VMS
- Depression
- Anxiety
- Pain
- Nocturia (need to urinate at night)
- Partner issues

(Bonanni et al., 2019; Luo et al., 2020; Proserpio et al., 2020; Terauchi et al., 2020)



Comparing Insomnia Interventions in Women with VMS



- Most effective: cognitive behavioral therapy for insomnia (CBT-I)
- Also effective:
 - Exercise
 - Yoga
 - Antidepressant

(Guthrie et al., 2018; Susanti et al., 2022)



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Audience Poll Question



(<https://www.medicalnewstoday.com/articles/stress-and-insomnia-linked-to-atrial-fibrillation-after-menopause>)

When the psychiatrist suggests an antidepressant to improve her mood, sleep and vasomotor symptoms, Sharmaine asks if she can take estrogen instead. She feels it would be less stigmatizing. What are your thoughts about this?

1. Yes, she can take estrogen instead.
2. She can take estrogen, but only to augment an antidepressant, not as monotherapy.
3. No, estrogen would be ineffective for depression.
4. I'm not sure.



Is Estrogen an Effective Antidepressant?

- Yes, but only during perimenopause
- Not FDA-approved for this indication
- Transdermal estradiol is best studied
- Some evidence that estrogen also alleviates perimenopausal anxiety
 - Greater sensitivity of anxiety to natural estrogen fluctuations predicts greater alleviation of anxiety by transdermal estrogen
- Adverse effects of estrogen may outweigh benefits for some women

(Lozza-Fiacco et al., 2022; Soares, 2023; Zhang et al., 2023)



Guidelines for Estrogen as an Antidepressant

- Consider estrogen monotherapy for women who
 - Are perimenopausal
 - Have new onset, subsyndromal depressive symptoms
 - Have prominent, bothersome VMS
- Six weeks is a full trial
- Consider use of estrogen augmentation for women who
 - Are perimenopausal
 - Have otherwise unexplained exacerbation of depressive symptoms during perimenopause, despite prior antidepressant effectiveness

(Soares, 2023)



Beyond Symptoms to Health Maintenance

- Midlife depression is associated with declines in health and functioning later in life
- On average, women live longer than men and spend more time disabled
- Compared to non-Veteran older women, older women Veterans have
 - More impaired physical functioning
 - Lower satisfaction with life and quality of life
- Perimenopause is a crucial time for health promotion and disease prevention



(Carmel, 2019; LaCroix et al., 2016; Solomon et al., 2022)



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Case Example

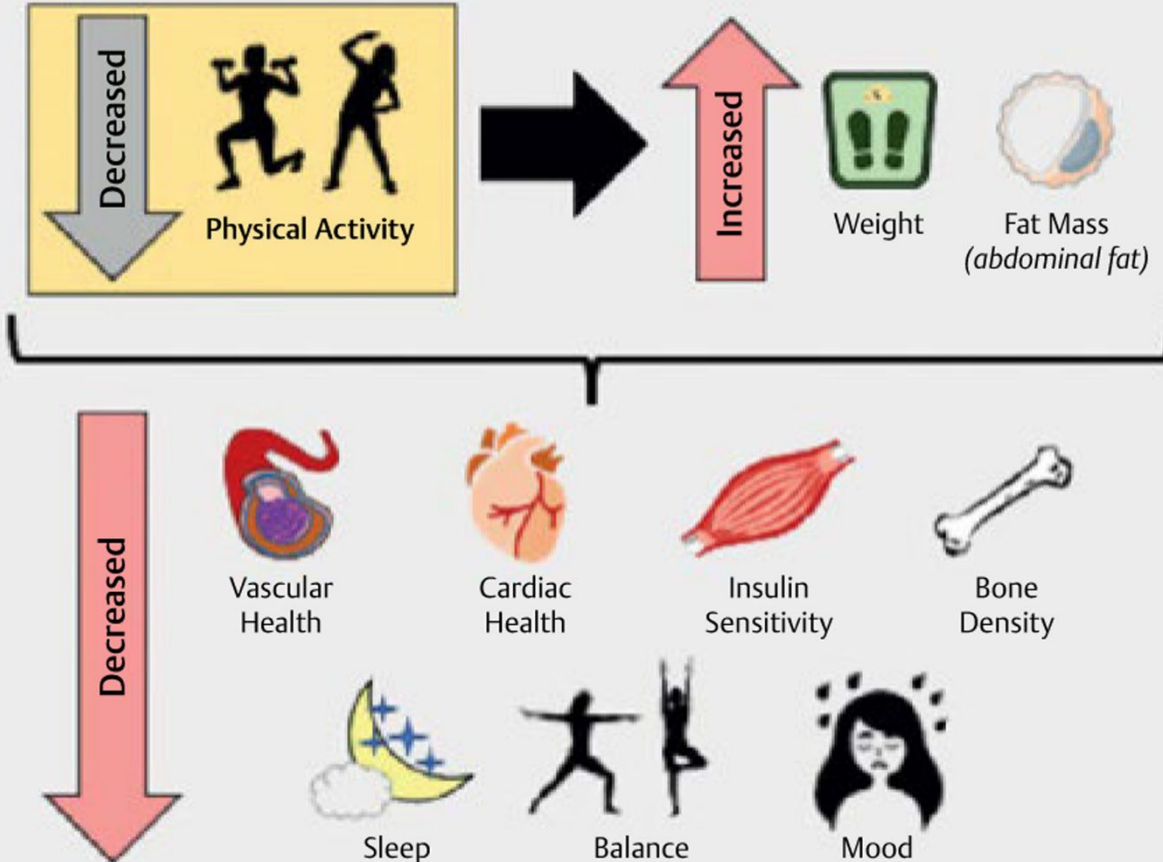
Sharmaine kept very physically active and fit while in the Air Force. After retiring and developing osteoarthritis, she stopped exercising. A physical therapist encouraged her to do a modified exercise routine, but she was too busy caring for her husband. After he died, she tried exercising but became very discouraged at how much less she was able to do compared to before, so she stopped. Instead, she's been eating sweets as comfort food.



(<https://www.medicalnewstoday.com/articles/stress-and-insomnia-linked-to-atrial-fibrillation-after-menopause>)



Menopause & Estrogen Deficiency



**Physical activity,
menopause, and
midlife**

(Hulteen et al., 2023)

Physical Activity, Perimenopause, and Midlife

- Perimenopause ushers in changes in body composition
 - Greater fat mass
 - Reduced muscle mass
 - Reduced bone density
 - Reduced physical functioning
- Only 17.6% of U.S. women ages 50–64 meet physical activity guidelines
- At midlife, women Veterans start out with a higher physical activity baseline than non-Veteran women, but have a steeper decline

(Elgaddal et al., 2022; Hulteen et al., 2023; Washington et al., 2016)



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Physical Activity and Mental Health

- There's a bidirectional relationship between depression and reduced physical activity
- Increasing physical activity
 - Reduces depression, irritability, anxiety, and insomnia
 - Improves stress response
 - Reduces chronic inflammation
- Greater frequency of exercise has greater effect

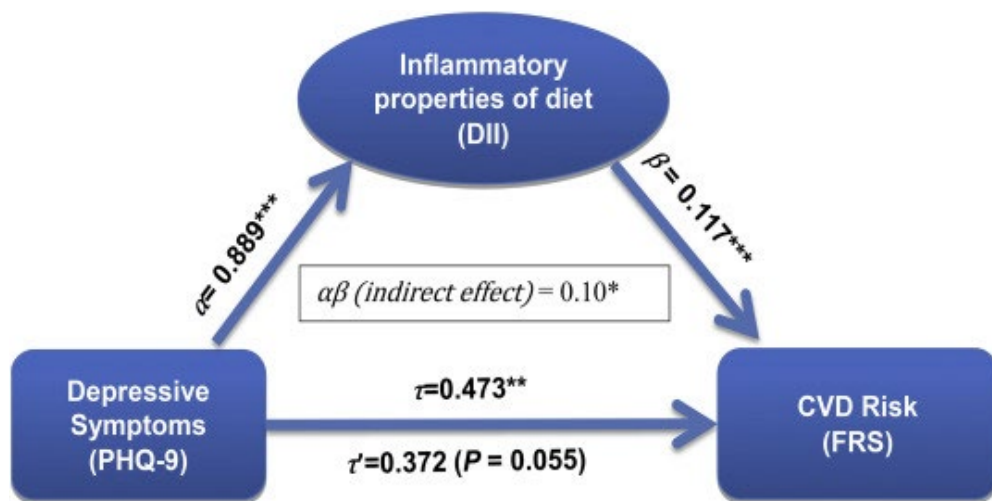


[\(https://utswmed.org/\)](https://utswmed.org/)

(Huang et al., 2023; Hulteen et al., 2023; Zhao et al., 2022)



Inflammatory Diets and Midlife Depression



- Midlife women with anti-inflammatory diets have a 15-20% lower risk of depression
- In women, inflammatory properties of diet mediate the relationship between depressive symptoms and cardiovascular risk

(Kang et al., 2020; Shivappa et al., 2016)



Pro- and Anti-Inflammatory Diets

Anti-inflammatory diet

- Vegetables, fruits
- Plant protein (e.g., legumes, soy, nuts, seeds)
- Fish; some lean animal protein
- Whole grains, high fiber

Pro-inflammatory diet

- Refined carbohydrates (e.g., white bread, pastry)
- Fried foods
- Sugar-sweetened beverages
- Red meat, processed meats
- Margarine, shortening, lard

(Byrd et al., 2019)



Case Example



(<https://www.medicalnewstoday.com/articles/stress-and-insomnia-linked-to-atrial-fibrillation-after-menopause>)

Part of Sharmaine's despair after being widowed is that she believes she will never have an intimate relationship again. Since intercourse is now painful due to vaginal dryness, she thinks men won't find her desirable.



Sexual Health and Perimenopause

- In a large study (n = 68,131), 50% of sexually active midlife women reported experiencing sexual problems
- Menopause-related and age-related contributors
 - Genital changes: vaginal dryness, vulvovaginal atrophy
 - Pelvic floor relaxation; pelvic organ prolapse
 - Changes in self image and body image
 - Depression, anxiety
 - Lack of partner or issues with partner
 - Medical conditions and medications

(Ling & Wang, 2023; von Hippel et al., 2019)



Improving Health and Building Readiness. Anytime, Anywhere — Always



Promoting Sexual Health

- Normalize discussion of sexual health as part of health care
- For women with sexual dysfunction, identify and treat contributory factors (e.g., genitourinary syndrome of menopause)
- When otherwise appropriate, choose psychotropics that either enhance or don't worsen sexual dysfunction
 - Bupropion
 - Bupirone
- Consider couples therapy, including sex therapy, when indicated



<https://newsroom.tricare.mil>

(Kuhle et al., 2021; Nappi & Cucinella, 2022; Nappi et al., 2022; Simon & Lukas, 2017)



Improving Health and Building Readiness. Anytime, Anywhere — Always



Midlife Role Transitions and Gender

- Marital transitions
 - Midlife women more likely to be widowed than men (15% of women vs 4% of men)
 - After a midlife divorce, women are less likely than men to find a new partner
- Caregiving transitions
 - Daughters 3x more likely than sons to assist aging parents with activities of daily living
 - Women often spend as many years caring for elderly relatives as they spent caring for children
- Health and aging transitions
 - Women are more likely than men to experience the onset of chronic illness
 - Concerns about age-related body image changes may intensify for women due to cultural roles
- In midlife women, all these correlate with increased depressive symptoms

(Turner et al., 2004)



Psychotherapy

- Interpersonal Psychotherapy (IPT)
 - Focuses on adapting to role transitions and losses
 - Common concerns: aging, declining health, ill partner, retirement and other work transitions, “empty nest”, widowhood, loneliness, relocation, dating
- CBT
 - Effective for perimenopausal depression
 - Adapted versions (e.g., CBT-Meno) also address other perimenopausal symptoms



<https://dothaneagle.com>

(Green et al., 2019; Green et al., 2020; Hunter, 2020; Khoshbooii et al., 2021; Miller et al., 1997)



Sharmaine's Treatment Plan

IPT to grieve losses
and re-examine roles

Gynecology
consult

Escitalopram



CBT-I

Exercise program with
low-impact aerobics,
strength training, balance
and flexibility



Key Takeaways

- There are large gaps in understanding and unconscious/bias at play in assessment and treatment of women's mental health symptoms
- Premenstrual wellness is a key component of comprehensive mental health
- Premenstrual mental health symptoms extend across a wide range of experiences
- Premenstrual mental health symptoms are underappreciated, underdiagnosed, and widely undertreated sources of occupational and social dysfunction.
- Perimenopause is a time of heightened risk of depression, anxiety, and PTSD.
- Contributory factors include hormonal flux, midlife role transitions, onset of chronic medical conditions, reduced physical activity, reduced social support, and negative attitudes toward aging.
- Targeting physical and emotional symptoms together can improve outcomes.
- Perimenopause is a crucial time for health promotion and disease prevention.



References

American Psychiatric Association. (2022). Diagnostic and statistical manual of mental disorders (5th ed., text rev.).

<https://doi.org/10.1176/appi.books.9780890425787>

Anderson, D.J., Chung, H., & Seib, C.A. (2020). Obesity, smoking, and risk of vasomotor menopausal symptoms: A pooled analysis of eight cohort studies. *American Journal of Obstetrics and Gynecology*, 222(5), pg. 478.

<https://doi.org/10.1016/j.ajog.2019.10.103>

Arab, A., Rafie, N., & Askari, G. (2020). Beneficial role of calcium in premenstrual syndrome: A systematic review of current literature. *International Journal of Preventive Medicine*, 22(11), pg. 156. https://doi.org/10.4103/ijpvm.IJPVM_243_19

Armour, M., Ee, C.C., & Hao, J. (2018). Acupuncture and acupressure for premenstrual syndrome. *Cochrane Database of Systematic Review*, 8(8), pg. CD005290. <https://doi.org/10.1002/14651858.CD005290.pub2>



References

- Avis, N.E., Crawford, S.L., & Green, R. (2018). Vasomotor symptoms across the menopause transition: Differences among women. *Obstetrics and Gynecology Clinics in North America*, 45(4), pgs. 629-640. <https://doi.org/10.1016/j.ogc.2018.07.005>
- Avis, N.E., Crawford, S.L., & Greendale, G. (2015). Duration of menopausal vasomotor symptoms over the menopause transition. *Journal of the American Medical Association Internal Medicine*, 175(4) pgs. 531-539. <https://doi.org/10.2147/NSS.S125807>
- Baker, F.C., de Zambotti, M, Colrain, I.M. (2018). Sleep problems during the menopausal transition: Prevalence, impact, and management challenges. *Nature and Science of Sleep*, 10, pgs. 73-95. <https://doi.org/10.2147/NSS.S125807>
- Beddig, T., Reinhard, I., Kuehner, C. (2019). Stress, mood, and cortisol during daily life in women with premenstrual dysphoric disorder (PMDD). *Psycho-neuro-endocrinology*, 109, pg. 104372. <https://doi.org/10.1016/j.psyneuen.2019.104372>



References

- Bengtsdotter, H., Lundin, C., Danielsson, K.G. (2018). Ongoing or previous mental disorders predispose to adverse mood reporting during combined oral contraceptive use. *The European Journal of Contraception and Reproductive Health Care*, 23(1), pgs. 45-51. <https://doi.org/10.1080/13625187.2017.1422239>
- Berenson, A.B., Asem, H., & Tan, A. (2011). Continuation rates and complications of intrauterine contraception in women diagnosed with bipolar disorder. *Obstetrics and Gynecology*, 118(6), pgs. 1331-1336. <https://doi.org/10.1097/AOG.0b013e318233beae>
- Bonanni, E., Schirru, A., & Di Perri, M.C. (2019). Insomnia and hot flashes. *Maturitas*, 126, pgs. 51-54. <https://doi.org/10.1016/j.maturitas.2019.05.001>
- Byrd, D.A., Judd, S.E., & Flanders, W.D. (2019). Development and validation of novel dietary and lifestyle inflammation scores. *The Journal of Nutrition*, 149(12), pgs. 2206-2218. <https://doi.org/10.1093/jn/nxz165>



References

Callegari, L.S., Zhao, X., & Nelson, K.M. (2014). Associations of mental illness and substance use disorders with prescription

contraception use among women Veterans. *Contraception*, 90(1), pgs. 97-103.

<https://doi.org/10.1016/j.contraception.2014.02.028>

Callegari, L.S., Zhao, X., & Nelson, K.M. (2015). Contraceptive adherence among women Veterans with mental illness and

substance use disorder. *Contraception*, 91(5), pgs. 386-392. <https://doi.org/10.1016/j.contraception.2015.01.013>

Carmel, S. (2019). Health and well-being in late life: Gender differences worldwide. *The Geriatric Medicine section of Frontiers in*

Medicine, 6. <https://doi.org/10.3389/fmed.2019.00218>

Carmichael, M.A., Thomson, R.L., & Moran, L.J. (2021). The impact of menstrual cycle phase on athletes' performance: a

narrative review. *International Journal of Environmental Research and Public Health*, 18(4), pg. 1667.

<https://doi.org/10.3390/ijerph18041667>



References

- Cronje, W.H., Vashisht, A., & Studd, J.W.W. (2004). Hysterectomy and bilateral oophorectomy for severe premenstrual syndrome. *Human Reproduction*, 19(9), pgs. 2152-2155. <https://doi.org/10.1093/humrep/deh354>
- Csupor, D., Lantos, T., & Hegyi, P. (2019). Vitex agnus-castus in premenstrual syndrome: a meta-analysis of double-blind randomized controlled trials. *Complimentary Therapies in Medicine*, pg. 47, 102190. <https://doi.org/10.1016/j.ctim.2019.08.024>
- Dubol, M., Epperson, C.N., & Lanzenberger, R. (2020). Neuroimaging premenstrual dysphoric disorder: A systematic and critical review. *Frontiers of Neuroendocrinology*, 57, pg. 100838. <https://doi.org/10.1016/j.yfrne.2020.100838>
- Eggert, L., Witthöft, M., & Hiller, W. (2016). Emotion regulation in women with premenstrual syndrome (PMS): Explicit and implicit assessments. *Cognitive Therapy Research*, 40(6), pgs. 747-763. <https://doi.org/10.1007/s10608-016-9788-7>



References

- Eisenlohr-Moul, T.A., Girdler, S.S., & Johnson, J.L. (2017). Treatment of premenstrual dysphoria with continuous versus intermittent dosing of oral contraceptives: results of a three-arm randomized controlled trial. *Depression Anxiety*, 34(10), pgs.908-917.
- Elgaddal, N., Kramarow, E.A., & Reuben, C. (2022). Physical activity among adults aged 18 and over: United States, 2020. NCHS Data Brief, no 443. Hyattsville, MD, National Center for Health Statistics. <https://dx.doi.org/10.15620/cdc:120213>
- El Khoudary, S.R., Greendale, G., & Crawford, S.L. (2019). The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause*, 26(10), pgs.1213-1227.
<https://doi.org/10.1097/GME.0000000000001424>
- Endicott, J., Nee, J., & Harrison, W. (2006). Daily Record of Severity of Problems (DRSP): Reliability and validity. *Archives of Women's Mental Health*, 9(1), pgs. 41-49. <https://doi.org/10.1007/s00737-005-0103-y>



References

- Epperson, C.N., Pittman, B., & Czarkowski, K.A. (2007). Luteal-phase accentuation of acoustic startle response in women with premenstrual dysphoric disorder. *Neuropsychopharmacology*, 32(10), pgs. 2190-2198. <https://doi.org/10.1038/sj.npp.1301351>
- Eriksson, E., Hedberg, M.A., & Andersch, B. (1995). The serotonin reuptake inhibitor paroxetine is superior to the noradrenaline reuptake inhibitor maprotiline in the treatment of premenstrual syndrome. *Neuropsychopharmacology*, 12(2), pgs. 167-176. [https://doi.org/10.1016/0893-133X\(94\)00076-C](https://doi.org/10.1016/0893-133X(94)00076-C)
- Eroglu, M.Z., & Lus, M.G. (2020). Impulsivity, unplanned pregnancies, and contraception among women with bipolar disorder. *Neuropsychiatric Disease and Treatment*, 16, 407-414. <https://doi.org/10.2147/NDT.S238887>
- Freeman, E.W., Halbreich, U., & Grubb, G.S. (2012). An overview of four studies of a continuous oral contraceptive (levonorgestrel 90 mcg/ethinyl estradiol 20 mcg) on premenstrual dysphoric disorder and premenstrual syndrome. *Contraception*, 85(5), pgs. 437-45. <https://doi.org/10.1016/j.contraception.2011.09.010>.



References

- Freeman, E.W., Rickels, K., & Sondheimer, S.J. (1999). Differential response to antidepressants in women with premenstrual syndrome/premenstrual dysphoric disorder: a randomized controlled trial. *Archives of General Psychiatry*, 56(10), pgs. 932-939. <https://doi.org/10.1001/archpsyc.56.10.932>.
- Freeman, E.W., Rickels, K., & Yonkers, K.A. (2001). Venlafaxine in the treatment of premenstrual dysphoric disorder. *Obstetrics and Gynecology*, 98(5 Pt 1):737-744. [https://doi.org/10.1016/s0029-7844\(01\)01530-7](https://doi.org/10.1016/s0029-7844(01)01530-7)
- Gan, Q., Yu, R., & Lian, Z. (2023). Risk factors for perimenopausal depression in Chinese women: A meta-analysis. *Frontiers of Psychiatry*, 14, 1199806. <https://doi.org/10.3389/fpsy.2023.1199806>
- Gao, M., Zhang, H., & Gao, Z. (2022) Global and regional prevalence and burden for premenstrual syndrome and premenstrual dysphoric disorder: A study protocol for systematic review and meta-analysis. *Medicine (Baltimore)*, 101(1), e28528. <https://doi.org/10.1097/MD.00000000000028528>



References

- Gingnell, M., Engman, J., & Fick, A. (2022). Oral contraceptive use changes brain activity and mood in women with previous negative affect on the pill – A double-blinded, placebo-controlled randomized trial of a levonorgestrel-containing combined oral contraceptive. *Psychoneuroendocrinology*, 38(7):1133-44, 2013
- Grace, K.T., & Anderson, J.C. (2018). Reproductive coercion: A systematic review. *Trauma Violence Abuse* 19(4), pgs. 371-90. <https://doi.org/10.1177/1524838016663935>.
- Green, S.M., Donegan, E., & Frey, B.N. (2019). Cognitive behavior therapy for menopausal symptoms (CBT-Meno): A randomized controlled trial. *Menopause*, 26(9), pgs. 972-980. <https://doi.org/10.1097/GME.0000000000001363>.
- Green, S.M., Donegan, E., McCabe, R.E. (2020). Objective and subjective vasomotor symptom outcomes in the CBT-Meno randomized controlled trial. *Climacteric*, 23(5), pgs. 482-488. <https://doi.org/10.1080/13697137.2020.1737929>.



References

- Guthrie, K.A., Larson, J.C., & Ensrud, K.E. (2018). Effects of pharmacologic and nonpharmacologic interventions on insomnia symptoms and self-reported sleep quality in women with hot flashes: A pooled analysis of individual participant data from four MsFLASH trials. *Sleep*, 41(1), zsx190. <https://doi.org/10.1093/sleep/zsx190>.
- Halbreich, U., Borenstein, J., & Pearlstein, T. (2003). The prevalence, impairment, impact, and burden of premenstrual dysphoric disorder (PMS/PMDD). *Psychoneuroendocrinology*, 28(3), pgs. 1-23. [https://doi.org/10.1016/s0306-4530\(03\)00098-2](https://doi.org/10.1016/s0306-4530(03)00098-2)
- Hall, K.S., Steinberg, J.R., & Cwiak, C.A. (2015). Contraception and mental health: a commentary on the evidence and principles for practice. *American Journal of Obstetrics and Gynecology*, 212(6), 740-746. <https://doi.org/10.1016/j.ajog.2014.12.010>
- Hantsoo, L., & Epperson, C.N. (2015). Premenstrual dysphoric disorder: Epidemiology and treatment. *Current Psychiatry Reports*, 17(87). <https://doi.org/10.1007/s11920-015-0628-3>.



References

- Hartlage, S.A., Brandenburg, D.L., & Kravitz, H. (2004). Premenstrual exacerbation of depressive disorders in a community-based sample in the United States. *Psychosomatic Medicine*, 66(5), pgs. 698-706. <https://doi.org/10.1097/01.psy.0000138131.92408.b9>.
- Henz, A., Ferreira, C.F., & Oderich, C.L. (2018). Premenstrual syndrome diagnosis: a comparative study between the Daily Record of Severity of Problems (DRSP) and the Premenstrual Symptoms Screening Tool (PSST). *Revista brasileira de ginecologia e obstetricia : revista da Federacao Brasileira das Sociedades de Ginecologia e Obstetricia*, 40(1), pgs. 20-25. <https://doi.org/10.1055/s-0037-1608672>
- Huang, C., Luo, B., & Wang, J. (2023). Depressive symptoms and physical activity among community-dwelling perimenopausal women: a prospective longitudinal study. *BMC Psychiatry*, 23(1), 93. <https://doi.org/10.1186/s12888-023-04591-5>.
- Hulteen, R.M., Marlatt, K.L., & Allerton, T.D. (2023). Detrimental changes in health during menopause: The role of physical activity. *International Journal of Sports Medicine*, 44(6), pgs. 389-396. <https://doi.org/10.1055/a-2003-9406>



References

- Hunter, M.S. (2020). Cognitive behavioral therapy for menopausal symptoms. *Climacteric: The Journal of International Menopause Society*, 24(1), pgs. 51-56. <https://doi.org/10.1080/13697137.2020.1777965>
- Kang, J., Moser, D.K., & Biddle, M.J. (2020). Inflammatory properties of diet mediate the effect of depressive symptoms on Framingham risk score in men and women: Results from the National Health and Nutrition Examination Survey (2007 – 2014). *Nutrition Research*, 74, pgs. 78-86. <https://doi.org/10.1016/j.nutres.2019.11.008>
- Katon, J.G., Gray, E., & Gerber, M.R. (2016). Vasomotor symptoms and quality of life among Veteran and non-Veteran postmenopausal women. *The Gerontologist*, 56(1), pgs. S40-53. <https://doi.org/10.1093/geront/gnv104>
- Khan, S.J., Kapoor, E., & Faubion, S.S. (2023). Vasomotor symptoms during perimenopause: a practical guide on current treatments and future perspectives. *International Journal of Womens Health*, 14(15), pgs. 273-287. <https://doi.org/10.2147/IJWH.S365808>



References

- Khoshbooi, R., Hassan, S.A., & Deylami, N. (2021). Effects of group and individual culturally adapted cognitive behavioral therapy on depression and sexual satisfaction among perimenopausal women. *International Journal of Environmental Research and Public Health*, 18(14), pg. 7711. <https://doi.org/10.3390/ijerph18147711>
- Kravitz, H.M., & Joffe, H. (2011). Sleep during the perimenopause: A SWAN story. *Obstetrics and Gynecology Clinics of North America*, 38(3), pgs. 567-586. <https://doi.org/10.1016/j.ogc.2011.06.002>
- Kuehner, C., & Nayman, S. (2021). Premenstrual exacerbations of mood disorders: Findings and knowledge gaps. *Current Psychiatry Report*, 23(11), pg. 78. <https://doi.org/10.1007/s11920-021-01286-0>
- Kuhle, C.L., Zhang, X., & Kapoor, E. (2021). Misconceptions about sexual health in older women. *Mayo Clinic Proceedings*, 96(4), pgs. 866-869. <https://doi.org/10.1016/j.mayocp.2020.09.037>



References

- LaCroix, A.Z., Rillamas-Sun, E., & Woods, N.F. (2016). Aging well among women veterans compared with non-veterans in the Women's Health Initiative. *The Gerontologist*, 56(1), pgs. S14-S26. <https://doi.org/10.1093/geront/gnv124>
- Lanza di Scalea, & T., Pearlstein, T. (2019). Premenstrual dysphoric disorder. *The Medical Clinic of North America*, 103, 613-628. <https://doi.org/10.1016/j.mcna.2019.02.007>
- Ling, J., & Wang, Y-H. (2023). Association between depressive mood and body image and menopausal symptoms and sexual function in perimenopausal women. *World Journal of Clinical Cases*, 11(32), pgs. 7761-7769. <https://doi.org/10.12998/wjcc.v11.i32.7761>
- Lozza-Fiacco, S., Gordon, J.L., & Andersen, E.H. (2022). Baseline anxiety-sensitivity to estradiol fluctuations predicts anxiety symptom response to transdermal estradiol treatment in perimenopausal women – A randomized clinical trial. *Psychoneuroendocrinology*, 143, 105851. <https://doi.org/10.1016/j.psyneuen.2022.105851>



References

- Luo, M., Li, J., & Tang, R. (2020). Insomnia symptoms in relation to menopause among middle-aged Chinese women: findings from a longitudinal cohort study. *Maturitas*, 141, pgs. 1-8. <https://doi.org/10.1016/j.maturitas.2020.06.010>
- Ma, S., & Song, S.J. (2023). Oral contraceptives containing drospirenone for premenstrual syndrome. *Cochrane Database Systematic Reviews*, 6(6), CD006586. <https://doi.org/10.1002/14651858.CD006586.pub5>
- Maki, P.M., Kornstein, S.G., & Joffe, H. (2019). Guidelines for the evaluation and treatment of perimenopausal depression: summary and recommendations. *Journal of Womens Health, (Larchmt)* 28(2), pgs. 117-113.
<https://doi.org/10.1089/jwh.2018.27099.mensocrec>
- Maharaj, S., & Trevino, K. (2015). A comprehensive review of treatment options for premenstrual syndrome and. premenstrual dysphoric disorder. *Journal of Psychiatric Practice*, 21(5), pgs. 334-350. <https://doi.org/10.1097/PRA.000000000000099>



References

- Michopoulos, V., Huibregtse, M.E., & Chaine, E.B. (2023). Association between perimenopausal age and greater posttraumatic stress disorder and depression symptoms in trauma-exposed women. *Menopause*, 30(10), pgs. 1038-1044. <https://doi.org/10.1097/GME.0000000000002235>
- Miller, M.D., Wolfson, L., & Frank, E. (1997). Using interpersonal psychotherapy (IPT) in a combined psychotherapy/medication research protocol with depressed elders. A descriptive report with case vignettes. *The Journal of Psychotherapy Practice and Research*, 7(1), pgs. 47-55.
- Moore, M., Kwitowski, M., & Javier, S. (2017). Examining the influence of mental health on dual contraceptive method use among college women in the United States. *Sexual and Reproductive Healthcare: Official Journal of the Swedish Association of Midwives*, 12, pgs. 24-29. <https://doi.org/10.1016/j.srhc.2017.01.004>
- Muñoz, E.A., Shorey, R.C., & Temple, J.R. (2023). Reproductive coercion victimization and associated mental health outcomes among female-identifying young adults. *Journal of Trauma & Dissociation: The Official Journal of the International Society for the Study of Dissociation (ISSD)*, 24(4), pgs. 538-54. <https://doi.org/10.1080/15299732.2023.2212407>



References

Nielsen, S.E., & Herrera, A.Y. (2017). Mammalian hormone-behavior systems. In Pfaff DW & Joëls M: *Hormones, Brain, and Behavior* (3rd edition).

Nolan, L.N., & Hughes, L. (2022). Premenstrual exacerbation of mental health disorders: A systematic review of prospective studies. *Archives of Womens Mental Health*, 25(5), pgs. 831-852. <https://doi.org/10.1007/s00737-022-01246-4>

Paramsothy, P., Harlow, S.D., & Nan, B. (2017). Duration of the menopausal transition is longer in women with young age at onset: The multiethnic Study of Women's Health Across the Nation. *Menopause*, 24(2), pgs. 142-149. <https://doi.org/10.1097/GME.0000000000000736>

Pearlstein, T.B., Stone, A.B., & Lund, S.A. (1997). Comparison of fluoxetine, bupropion, and placebo in the treatment of premenstrual dysphoric disorder. *Journal of Clinical Psychopharmacology*, 17(4), pgs. 261-266. <https://doi.org/10.1097/00004714-199708000-00004>



References

Pilver, C.E., Libby, D.J., & Hoff, R.A. (2013). Premenstrual dysphoric disorder as a correlate of suicidal ideation, plans, and attempts among a nationally representative sample. *Social Psychiatry and Psychiatric Epidemiology*, 48(3), 437-446.

<https://doi.org/10.1007/s00127-012-0548-z>

Pinkerton, J.V., Guico-Pabia, C.J., & Taylor, H.S. (2010). Menstrual cycle-related exacerbation of disease. *American Journal of Obstetrics and Gynecology*, 202(3), pgs. 221-231. <https://doi.org/10.1016/j.ajog.2009.07.061>

Poromaa, I.S., & Segebladh, B. (2012). Adverse mood symptoms with oral contraceptives. *Acta Obstetrica et Gynecologica Scandinavica*, 91(4), pgs. 420-427. <https://doi.org/10.1111/j.1600-0412.2011.01333.x>

Prasad, D., Wollenhaupt-Aguiar, B., & Kidd, K.N. (2021). Suicidal risk in women with premenstrual syndrome and premenstrual dysphoric disorder: a systematic review and meta-analysis. *Journal of Womens Health (Larchmt)*, 30(12), pgs. 1693-1707.

<https://doi.org/10.1089/jwh.2021.0185>



References

- Protopopescu, X., Tuescher, O., & Pan, H. (2008). Toward a functional neuroanatomy of premenstrual dysphoric disorder. *Journal of Affective Disorders*, 108(1-2), pgs. 87-94. <https://doi.org/10.1016/j.jad.2007.09.015>
- Proserpio, P., Marra, S., & Campana, C. (2020). Insomnia and menopause: a narrative review on mechanisms and treatments. *Climacteric*, 23(6), pgs. 539-549. <https://doi.org/10.1080/13697137.2020.1799973>
- Reid, R.L. (2012). When should surgical treatment be considered for premenstrual dysphoric disorder? *Menopause International*, 18(2), pgs. 77-81. <https://doi.org/10.1258/mi.2012.012009>
- Reilly, T.J., Wallman, P., & Clark, I. (2023). Intermittent selective serotonin reuptake inhibitors for premenstrual syndromes: a systematic review and meta-analysis of randomized trials. *Journal of Psychopharmacology (Oxford, England)*, 37(3), pgs. 261-267. <https://doi.org/10.1177/02698811221099645>



References

- Reimers, A., Brodtkorb, E., & Sabers, A. (2015). Interactions between hormonal contraception and antiepileptic drugs: clinical and mechanistic considerations. *Seizure*, 28, pgs. 66-70. <https://doi.org/10.1016/j.seizure.2015.03.006>
- Robakis, T., Williams, K.E., & Nutkiewicz, L. (2019). Hormonal contraceptives and mood: review of the literature and implications for future research. *Current Psychiatry Reports*, 21(7),57. <https://doi.org/10.1007/s11920-019-1034-z>
- Saglam, H.Y., & Orsal, O. (2020). Effect of exercise on premenstrual symptoms: a systematic review. *Complementary Therapies In Medicine*, 48, 102272. <https://doi.org/10.1016/j.ctim.2019.102272>
- Sarayani, A., Winterstein, A., & Cristofolletti, R. (2023). Real-world effect of a potential drug-drug interaction between topiramate and oral contraceptives on unintended pregnancy outcomes. *Contraception*, 120, 109953. <https://doi.org/10.1016/j.contraception.2023.109953>



References

- Schmidt, P.J., Martinez, P.E., & Nieman, L.K. (2017). Premenstrual dysphoric disorder symptoms following ovarian suppression: triggered by change in ovarian steroid levels but not continuous stable levels. *The American Journal of Psychiatry*, 174(10), 980-989. <https://doi.org/10.1176/appi.ajp.2017.16101113>
- Shobeiri, F., Araste, F.E., & Ebrahimi, R. (2017). Effect of calcium on premenstrual syndrome: A double-blind randomized clinical trial. *Obstetrics & Gynecology Science*, 60(1), 100-105. <https://doi.org/10.5468/ogs.2017.60.1.100>
- Schoretsantis, G., Deligiannidis, K.M., & Paulzen, M. (2022). Drug-drug interactions between psychotropic medications and oral contraceptives. *Expert Opinion on Drug Metabolism & Toxicology*, 18(6), pgs. 395-411. <https://doi.org/10.1080/17425255.2022.2106214>
- Sidhu, J., Job, S., & Singh, S. (2006). The pharmacokinetic and pharmacodynamic consequences of the co-administration of lamotrigine and a combined oral contraceptive in healthy female subjects. *British Journal of Clinical Pharmacology*, 61(2), pgs. 191-199. <https://doi.org/10.1111/j.1365-2125.2005.02539.x>



References

Silverman, J.G., & Raj, A. (2014). Intimate partner violence and reproductive coercion: Global barriers to women's reproductive control.

PLoS Medicine, 11(9), e1001723. <https://doi.org/10.1371/journal.pmed.1001723>

Simon, J.A., & Lukas, V. (2017). Distressing sexual functioning at midlife: Unmet needs, practical diagnoses, and available treatments.

Obstetrics and Gynecology, 130(4), pgs. 889-905. <https://doi.org/10.1097/AOG.0000000000002268>

Soares, C.N. (2023). Menopause and mood: The role of estrogen in midlife depression and beyond. *The Psychiatric Clinics of North*

America, 46(3), pgs. 463-473. <https://doi.org/10.1016/j.psc.2023.04.004>

Solomon, D.H., Colvin, A., & Lange-Maia, B.S. (2022). Factors associated with 10-year declines in physical health and function among

women during midlife. *JAMA Network Open*, 5(1), e2142773. <https://doi.org/10.1001/jamanetworkopen.2021.42773>



References

- Steinberg, J.R., Adler, N.E., & Thompson, K.M. (2018). Current and past depressive symptoms and contraceptive effectiveness method selected among women seeking reproductive health services. *Social Science and Medicine*, 214, pgs. 20-25. <https://doi.org/10.1016/j.socscimed.2018.08.009>
- Steiner, M., Macdougall, M., & Brown, E. (2003). The Premenstrual Symptoms Screening Tool (PSST) for clinicians. *Archives of Womens Mental Health*, 6(3), pgs. 203-209. <https://doi.org/10.1007/s00737-003-0018-4>
- Susanti, H.D., Sonko, I., & Chang, P-C. (2022). Effects of yoga on menopausal symptoms and sleep quality across menopause statuses: a randomized controlled trial. *Nursing and Health Sciences*, 24(2), pgs. 368-379. <https://doi.org/10.1111/nhs.12931>
- Terauchi, M., Odai, T., & Hirose, A. (2020). Muscle and joint pains in middle-aged women are associated with insomnia and low grip strength: A cross-sectional study. *Journal of Psychosomatic Obstetrics and Gynaecology*, 41(1), pgs. 15-21. <https://doi.org/10.1080/0167482X.2018.1530211>



References

Turner, M.J., Killian, T.S., & Cain, R. (2004). Life course transitions and depressive symptoms among women in midlife.

International Journal of Aging & Human Development, 58(4), pgs. 241-265. <https://doi.org/10.2190/4CUU-KDKC-2XAD-HY0W>

Usall, J., Pinto-Meza, A., & Fernández, A.(2009). Suicide ideation across reproductive life cycle of women. Results from a European epidemiological study. *Journal of Affective Disorders*, 116(1-2), pgs.144-147.

<https://doi.org/10.1016/j.jad.2008.12.006>

von Hippel, C., Adhia, A., & Rosenberg, S. (2019). Sexual function among women in midlife: findings from the Nurses' Health Study II. *Womens Health Issues*, 29(4), pgs. 291-298. <https://doi.org/10.1016/j.whi.2019.04.006>

Wagner-Schuman, M., Kania, A., & Barone, J.C. (2023). What's stopping us? Using GnRH analogs with stable hormone add back in treatment-resistant premenstrual dysphoric disorder: Practical guidelines and risk-benefit analysis for long-term therapy. *The Journal of Clinical Psychiatry*, 84(4), 22r14614. <https://doi.org/10.4088/JCP.22r14614>



References

- Washington, D.L., Gray, K., & Hoerster, K.D. (2016). Trajectories in physical activity and sedentary time among women veterans in the Women's Health Initiative. *The Gerontologist*, 56(1), pgs. S27-39. <https://doi.org/10.1093/geront/gnv676>
- Weise, C., Kaiser, G., & Janda, C. (2019). Internet-based cognitive-behavioural intervention for women with premenstrual dysphoric disorder: A randomized controlled trial. *Psychotherapy and Psychosomatics*, 88(1), pgs. 16-29. <https://doi.org/10.1159/000496237>
- Woods, N.F., Coslov, N., & Richardson, M.K. (2022). Perimenopause meets life: observations from the Women Living Better Survey. *Menopause (New York, N.Y.)*, 29(12), pgs. 1388-1398. <https://doi.org/10.1097/GME.0000000000002072>
- World Health Organization. (2022). International Classification of Diseases, 11th Revision.



References

- Yan, H., Ding, Y., & Guo, W. (2021). Suicidality in patients with premenstrual dysphoric disorder – A systematic review and meta-analysis. *Journal of Affective Disorders*, 295, 339-346. <https://doi.org/10.1016/j.jad.2021.08.082>
- Yonkers, K.A., Kornstein, S.G., & Gueorguieva, R. (2015). Symptom-onset dosing of sertraline for the treatment of premenstrual dysphoric disorder: a randomized clinical trial. *JAMA Psychiatry*, 72(10), pgs. 1037-1044. <https://doi.org/10.1001/jamapsychiatry.2015.1472>
- Zemlak, J.L., Marineau, L., & Willie, T.C. (2023). Contraceptive use among women experiencing intimate partner violence and reproductive coercion: The moderating role of PTSD and comorbid depression. *Violence Against Women*, 10778012231153372. <https://doi.org/10.1177/10778012231153372>
- Zhang, J., Yin, J., & Song, X. (2023). The effect of exogenous estrogen on depressive mood in women: A systematic review and meta-analysis of randomized controlled trials. *Journal of Psychiatric Research*, 162, pgs. 21-29. <https://doi.org/10.1016/j.jpsychires.2023.04.002>



References

Zhao, Y., Niu, H., & Liu, S. (2022). Effects of aerobics training on anxiety, depression, and sleep quality in perimenopausal women.

Frontiers in Psychiatry, 13, 1025682. <https://doi.org/10.3389/fpsy.2022.1025682>

Zhou, Q., Wang, B., & Hua, Q. (2021). Investigation of the relationship between hot flashes, sweating and sleep quality in perimenopausal and postmenopausal women: The mediating effect of anxiety and depression. *BMC Womens Health*,

21(1), 293. <https://doi.org/10.1186/s12905-021-01433-y>



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