

VASOMOTOR SYMPTOMS AS A VITAL SIGN

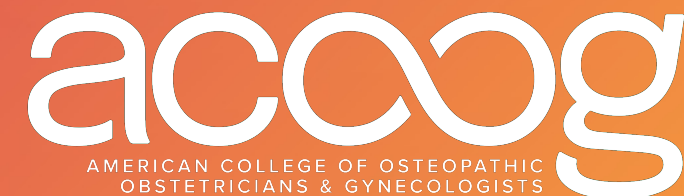
Cardiovascular, Metabolic, and Mental Health Risk in Menopause Care

Module 1: VMS as a Whole-Health Signal

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What you'll be able to do

1 Interpret moderate-to-severe VMS as a marker of cardiovascular, metabolic, and mental-health risk, via shared KNDy-neuron pathways.

2 Identify the domain-specific screens that change when VMS is present — lipids, glucose/A1c, BP trajectory, a depression screen, and sleep-apnea screening.

3 Recognize the bidirectional VMS–mood relationship, including elevated risk of new-onset and recurrent depression and suicidality.

4 Apply a structured screening bundle to a midlife patient presenting with moderate-to-severe VMS.

From nuisance to vital sign

- VMS affect ~70–80% of women through the transition — the classic menopausal symptom. [3]
- Historically treated as a self-limited quality-of-life problem — under-discussed, under-treated.
- The reframe: moderate-to-severe, frequent, or persistent VMS mark cardiovascular, metabolic, and mental-health risk. [2, 3]
- The question shifts from “how do I stop the hot flashes?” to “what else should I screen for?”

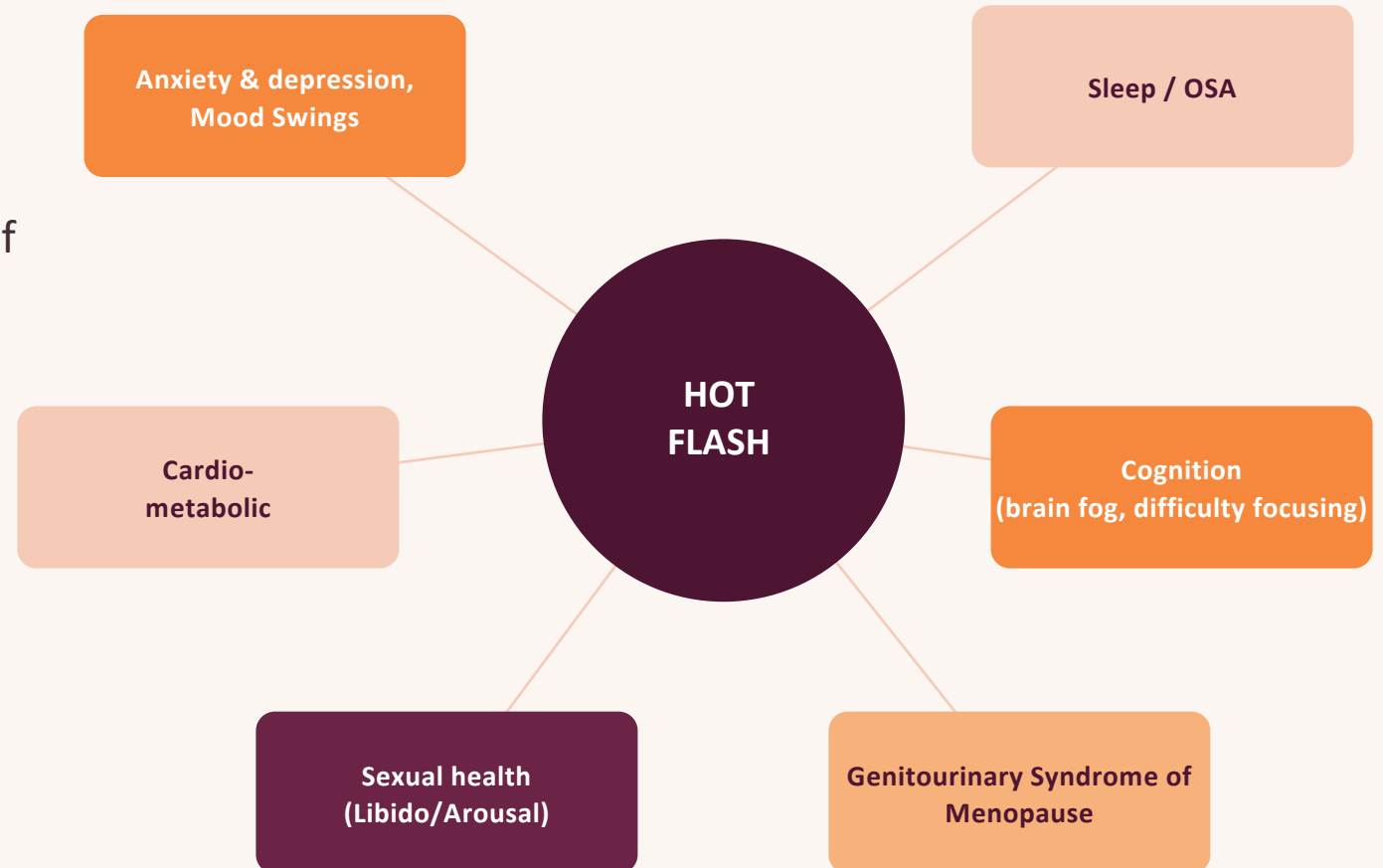
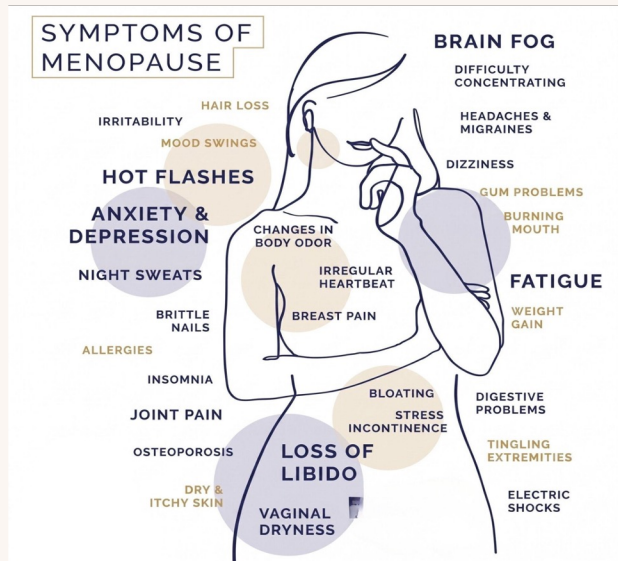
70–80%

of women experience VMS in the transition

***A hot flash is a
window into vascular,
metabolic & mood health.***

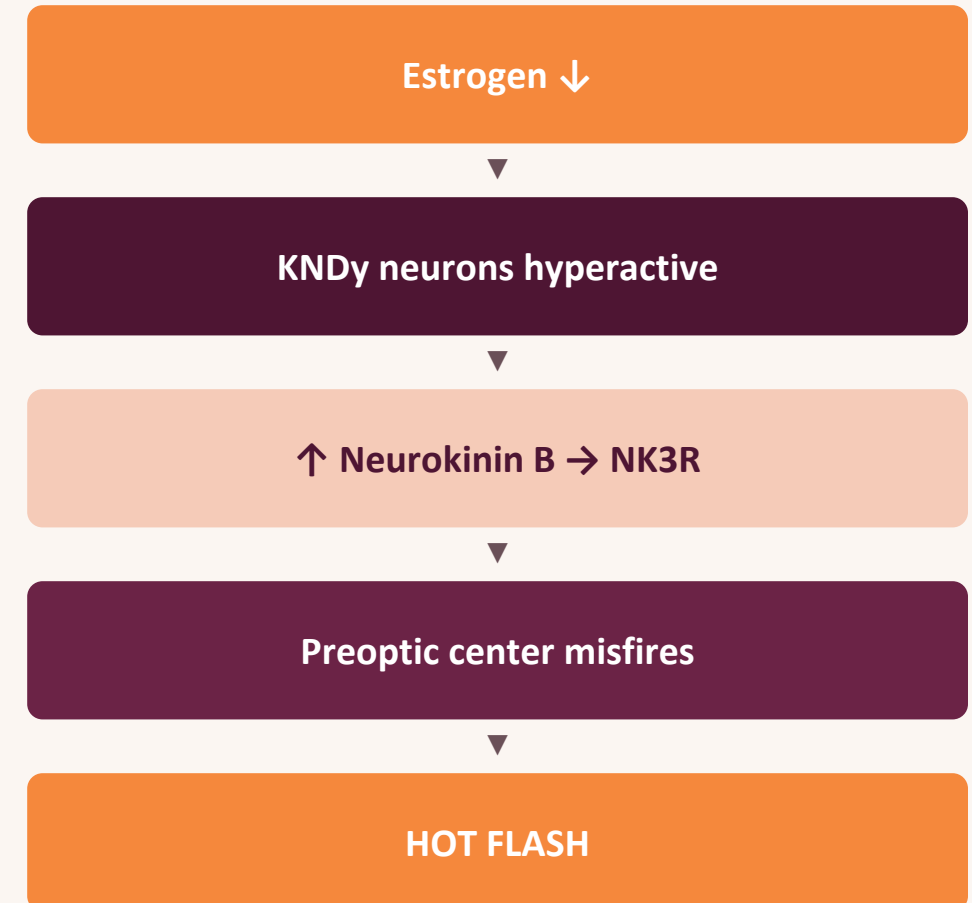
The hot flash is only the tip of the iceberg

- Up to ~80% experience VMS; ~25% describe them as severe. [3]
- VMS are the top reason women seek menopause care — atop a broad constellation of real, physiologic symptoms. [3]
- Validation matters: dismissing them delays recognition of downstream risk.



KNDy neurons: a shared neuroendocrine pathway

- KNDy neurons (kisspeptin, neurokinin B, dynorphin) sit in the hypothalamic arcuate nucleus. [1]
- They link reproductive hormones to thermoregulation via the median preoptic area. [1]
- Estrogen withdrawal → KNDy hyperactivity → excess neurokinin B on NK3 receptors → the hot flash. [1]
- Same circuitry touches autonomic, CV, sleep, and mood control — why VMS travel with other risks.



VMS predict hard cardiovascular events

- SWAN: 3,083 women, baseline age 42–52, followed up to 22 years. [2]
- Frequent and/or persistent VMS → more incident CVD events: MI, stroke, heart failure, revascularization. [2]
- This moved VMS beyond subclinical markers (carotid IMT, endothelial function) to hard endpoints. [2, 3]

22 yrs

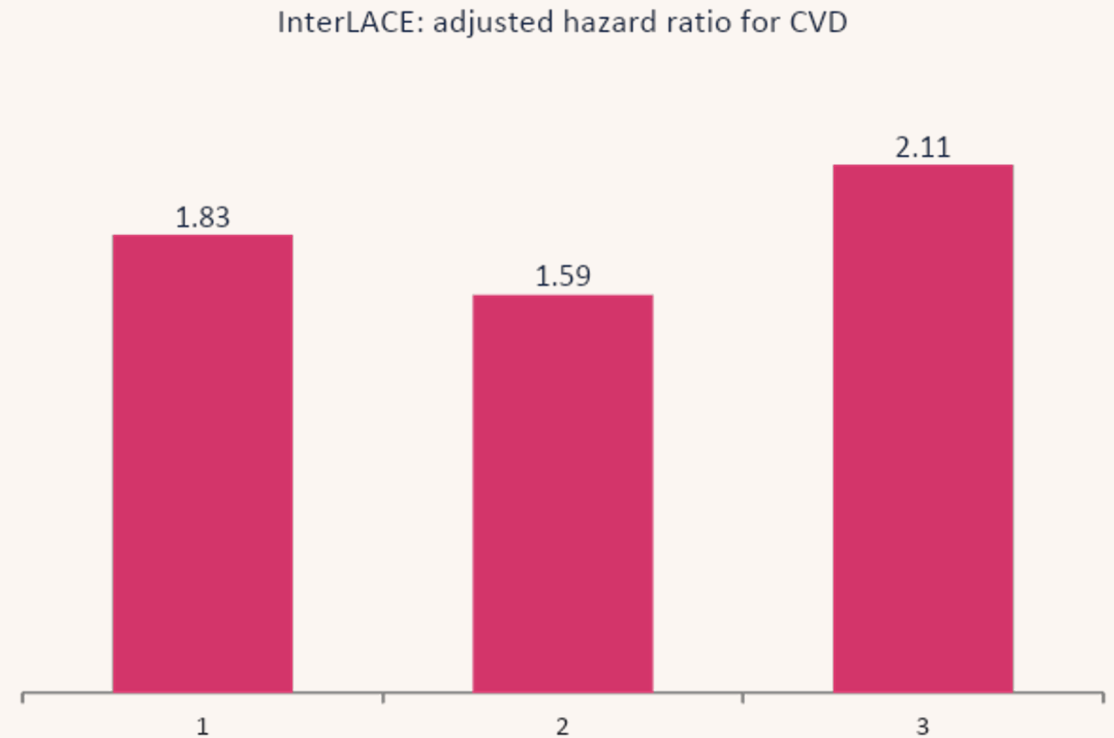
prospective follow-up · 3,083 women

**Hard
endpoints**

MI · stroke · heart failure · revascularization

Suffering and risk track together

- The features that mark more suffering — more frequent, severe, persistent — mark more CV risk.
- SWAN: frequent/persistent VMS → 50–77% higher CVD event risk. [2]
- InterLACE (23,365 women, 6 cohorts): a clear severity gradient. [7]
- Reframe: symptom burden is itself a risk stratifier. [15]



VMS travel with the whole risk-factor cluster

1

Blood pressure

Higher clinic & ambulatory
BP

[3, 6]

2

Lipids

Adverse profile beyond the
midlife shift

[4]

3

Insulin resistance

Higher glucose & HOMA-IR in
SWAN

[5]

4

Metabolic syndrome

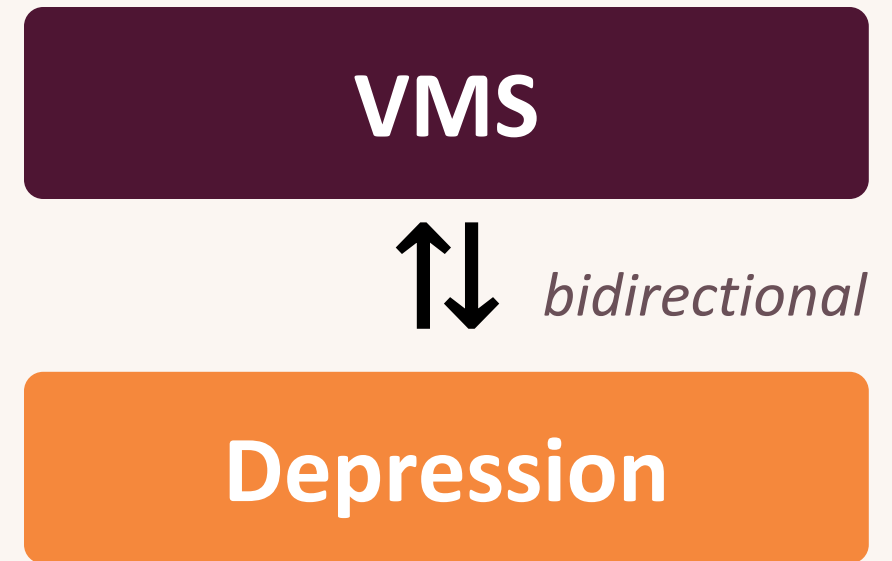
Clusters with MetS
components

[6]

Honest framing: the metabolic association is strongest in the highest-quality cohorts and heterogeneous across the broader literature — a signal worth screening, not settled causation.

A bidirectional relationship

- The transition is a window of elevated depression risk vs. premenopause. [10]
- VMS and depressive symptoms each raise the risk of the other. [9]
- VMS predict next-day negative mood, partly via nocturnal VMS and sleep loss. [15]
- A VMS visit is a prompt to screen mood — and a mood visit, to ask about VMS.



Recurrence and suicide risk

- The transition raises risk of new-onset and recurrent major depression. [10, 12]
- Not fully explained by VMS or sleep alone.
- Mood and suicidality don't always move together — screen for both. [13]
- PHQ-9 item 9 already screens self-harm — have a referral pathway ready.

16/19

studies: ↑ suicidality
across the transition
[13]

~7×

higher suicidal-
ideation risk in
perimenopause [14]

***The perimenopausal increase
held even in women with no
prior mood disorder. [14]***

Hormone therapy and mood

Not for mood disorders

Estrogen is not approved to treat mood disturbance, and is ineffective for depression postmenopausally. [27]

A perimenopausal window

In perimenopausal women with depression, estrogen has improved depressive symptoms to a degree similar to antidepressants. [26]

May augment

Estrogen-based therapy may augment antidepressant response — best when VMS also warrant it. [15]

Bottom line: treat VMS on their merits, take the mood benefit where evidence supports it (perimenopause), and never substitute hormones for indicated psychiatric care. [15]

Don't stop at night sweats: screen for OSA

- Midlife sleep disruption is not only about hot flashes.
- Higher OSA risk (STOP-BANG) tracked with heavier menopause symptom burden: 16.8 vs 12.9 ($P < 0.001$). [16]
- OSA is under-recognized in women and feeds back into CV, metabolic, and mood risk.
- US postmenopausal women (NHANES, $n=3,560$): trouble sleeping and OSA each raised the odds of hypertension (OR ~1.6); both short and long sleep increased risk. [25]

STOP-BANG · 8-item OSA screen · ≥ 3 = intermediate-to-high risk

S Snoring	T Tiredness	O Observed apnea	P Pressure (BP)
B BMI	A Age > 50	N Neck size	G Gender

Three or more “yes” answers earns a referral for testing. [16]

She's in your office today — what's your move?

THE PATIENT

52-year-old woman · 6–8 moderate-to-severe hot flashes daily for a year · frequent night sweats · unrefreshing sleep · BMI 34 · BP drifting 118/74 → 138/86 over 3 years · new low mood and loss of interest this month.

POLL — commit before we debrief

- A** Reassure — VMS are self-limited; no added workup
- B** Order the VMS screening bundle: lipids, glucose/A1c, BP trend, PHQ-9, STOP-BANG
- C** Lipids only; defer the rest until she is postmenopausal
- D** Refer to cardiology before any primary-care screening

The next slide is the debrief.

The VMS screening bundle

Order	What changes when VMS is present	Ref.
Lipid panel	Screen for the adverse lipid profile that tracks with VMS.	4
Fasting glucose / A1c	Assess glucose & insulin resistance; VMS → higher HOMA-IR in SWAN.	5
Blood-pressure trajectory	Confirm and trend BP; VMS cluster with hypertension and MetS.	3, 6
Depression screen (PHQ-9)	Bidirectional VMS–depression link; item 9 also screens suicidal ideation.	9, 13
OSA screen (STOP-BANG)	Screen for sleep apnea rather than blaming all sleep loss on night sweats.	16

Additive, not universal — let a meaningful VMS complaint raise the priority of these five domains.



The expanded panel — evidence-informed, not a mandate

Add-on	What it detects / why it fits	Evidence
Fasting insulin (→ HOMA-IR)	Flags insulin resistance before glucose/A1c rise. [5]	Recommend
Lipoprotein(a), once	Genetic, likely-causal CV risk factor that rises across menopause. [17,18]	Recommend
Apolipoprotein B	Atherogenic particle number; refines risk beyond LDL-C. [3]	Recommend
Bone density (DXA)	Screen if ≥1 osteoporosis risk factor — family history, prior fragility fracture, low BMI, early/surgical menopause, smoking, excess alcohol, chronic steroids, vitamin D deficiency; all women ≥65. [24]	Recommend
Ferritin	Iron deficiency without anemia (missed by CBC); fatigue & cognition. [20]	Consider
Vitamin D (25-OH-D)	Bone indication strong; mood link associative. [19]	Consider
DSDS / FSFI	Sexual function — tied to mood, clusters with metabolic syndrome. [21,22,23]	Consider

Use it tomorrow

1. Treat moderate-to-severe VMS as a vital sign — let it expand your screening, not just your symptom management.
2. Symptom burden is a risk stratifier: more frequent, severe, or persistent VMS flag more suffering and more CV risk. [2, 7]
3. Let “bothersome,” not a strict hot-flash count, drive treatment. [15]
4. Screen mood when VMS are present — and screen suicidality, not just low mood (PHQ-9 item 9). [13, 14]
5. Don't blame all midlife sleep complaints on hot flashes — screen for OSA. [16]
6. Frame the metabolic association honestly: a signal worth screening, not a foregone conclusion.

Whole-health care is body-unity in practice

Tenet 1 — The body is a unit

A person is a unit of body, mind, and spirit. This module treats the hot flash not as an isolated symptom but as a signal from an interconnected system — cardiovascular, metabolic, sleep, and affective health are inseparable. Screening across domains is osteopathic principle as clinical practice.

Tenet 4 — Rational, whole-person treatment

Rational treatment rests on body unity and the interrelationship of structure and function. The KNDy-neuron mechanism shows structure and function in reciprocal relationship: one hypothalamic circuit whose disruption manifests across organ systems, driving a rational, whole-person screening approach.

Numbered to the in-slide citations

1. Rance NE, et al. Modulation of body temperature and LH secretion by hypothalamic KNDy neurons. *Front Neuroendocrinol*. 2013;34(3):211–227.
2. Thurston RC, et al. Menopausal Vasomotor Symptoms and Risk of Incident CVD Events in SWAN. *J Am Heart Assoc*. 2021;10(3):e017416.
3. Thurston RC. Vasomotor symptoms and cardiovascular health: SWAN and MsHeart/MsBrain. *Climacteric*. 2024;27(1).
4. Thurston RC, et al. Vasomotor symptoms and lipid profiles in women transitioning through menopause. *Obstet Gynecol*. 2012;119(4):753–761.
5. Thurston RC, et al. Vasomotor Symptoms and Insulin Resistance in SWAN. *J Clin Endocrinol Metab*. 2012;97(10):3487–3494.
6. Janssen I, et al. Menopause and the metabolic syndrome: SWAN. *Arch Intern Med*. 2008;168(14):1568–1575.
7. Zhu D, et al. Vasomotor symptoms and risk of CVD: pooled analysis of six studies (InterLACE). *Am J Obstet Gynecol*. 2020;223(6):898.e1–898.e16.
8. Muka T, et al. Association of Vasomotor and Other Menopausal Symptoms with CVD Risk: Systematic Review & Meta-Analysis. *PLoS One*. 2016;11(6):e0157417.
9. Natari RB, et al. The bidirectional relationship between VMS and depression across the menopausal transition. *Menopause*. 2018;25(1):109–120.
10. Bromberger JT, et al. Major depression during and after the menopausal transition: SWAN. *Psychol Med*. 2011;41(9):1879–1888.
11. Freeman EW, et al. Associations of hormones and menopausal status with depressed mood. *Arch Gen Psychiatry*. 2006;63(4):375–382.
12. Freeman EW. Associations of depression with the transition to menopause. *Menopause*. 2010;17(4):823–827.

Numbered to the in-slide citations

13. Hendriks O, et al. Menopause and suicide: a systematic review. *Womens Health (Lond)*. 2025.
14. Usall J, et al. Suicide ideation across the reproductive life cycle of women (European study). *J Affect Disord*. 2009;116(1–2):144–147.
15. The Menopause Society. 2022 Hormone Therapy Position Statement. *Menopause*. 2022;29(7):767–794.
16. Gao CC, et al. Association of vasomotor symptoms and sleep apnea risk in midlife women. *Menopause*. 2018;25(4):391–398.
17. Honigberg MC, et al. Lipoprotein(a), menopausal hormone therapy, and CHD risk. *JAMA Cardiol*. 2022;7(5):565–568.
18. Anagnostis P, et al. The effect of menopause on lipoprotein(a) concentrations: systematic review & meta-analysis. *Maturitas*. 2022.
19. EMAS. Position statement: Vitamin D and menopausal health. *Maturitas*. 2023.
20. Favrat B, et al. Ferric carboxymaltose in fatigued, iron-deficient women (PREFER). *PLoS One*. 2014;9(4):e94217.
21. Clayton AH, et al. ISSWSH Process of Care for Management of HSDD in Women. *Mayo Clin Proc*. 2018;93(4):467–487.
22. Clayton AH, et al. Validation of the Decreased Sexual Desire Screener (DSDS). *J Sex Med*. 2009;6(3):730–738.
23. Dutra da Silva GM, et al. Prevalence of HSDD among postmenopausal women with metabolic syndrome. *Sex Med*. 2020;8(3):545–553.
24. US Preventive Services Task Force. Screening for Osteoporosis to Prevent Fractures: USPSTF Recommendation Statement. *JAMA*. 2025. doi:10.1001/jama.2024.27154.
25. Liu Z, Yang X, Sun F, et al. Association between sleep-related disorders and hypertension in postmenopausal women from the United States. *Menopause*. 2025. doi:10.1097/GME.0000000000002650.
26. Schmidt PJ, et al. Estrogen replacement in perimenopause-related depression: a preliminary report. *Am J Obstet Gynecol*. 2000;183(2):414–420.
27. Morrison MF, et al. Lack of efficacy of estradiol for depression in postmenopausal women: a randomized, controlled trial. *Biol Psychiatry*. 2004;55(4):406–412.