



Vasomotor Symptoms

Physiology & Counseling



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Intended for Healthcare Professionals Only

Learning Objectives



Discuss the physiology and impact of VMS due to menopause on midlife health



Understand how to characterize the different stages of reproductive aging and how to confirm menopause



Review the physiologic changes during a menopausal hot flash and the role of KNDy neurons



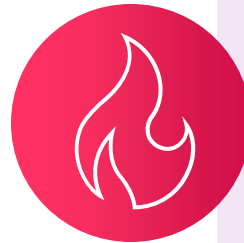
Present a counseling approach on how to discuss VMS with patients



Review principles of patient-centered counseling using the SHARE model (Seek, Help, Assess, Reach, Evaluate)

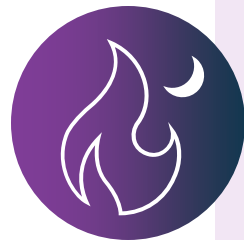
VMS (Vasomotor Symptoms)

VMS are one of the more common symptoms of menopause^{1,2}



Hot flashes

Transient episodes of flushing (cutaneous vasodilation), with intense heat on the face and upper body, increased heart rate, sometimes followed by chills^{1,2}



Hot flashes at night (night sweats)

Can result in night-time awakenings and sleep disruption³

VMS Severity

Definitions for VMS severity^a:

MILD

Sensation of Heat



MODERATE

Sensation of Heat Sweating



SEVERE

Sensation of Heat Sweating
Cessation of Activity



^aThe FDA has provided objective definitions, however patient perception of VMS is subjective.
VMS, vasomotor symptoms.

[1] Guidance for Industry: Estrogen and estrogen/progestin drug products to treat vasomotor symptoms and vulvar and vaginal atrophy symptoms—recommendations for clinical evaluation.
Food and Drug Administration; 2003. <https://www.fda.gov/media/71359/download> [Accessed Nov 2025].

“Diagnosing” Menopause

Diagnosis

Made on clinical grounds, based on symptoms

It is rarely necessary to measure hormones (LH, FSH)

Natural Menopause

Confirmed as the absence of menstrual periods for 1 year



May not be applicable for many, including those with:

- Infrequent cycles
- Hysterectomy
- Endometrial ablation
- Progestin IUD or using contraception that suppresses ovulation

Surgical Menopause

Removal of both ovaries before the onset of their spontaneous or natural menopause

STRAW + 10 (Stages of Reproductive Aging)¹

Menarche

Final menstrual period

Menopause is diagnosed

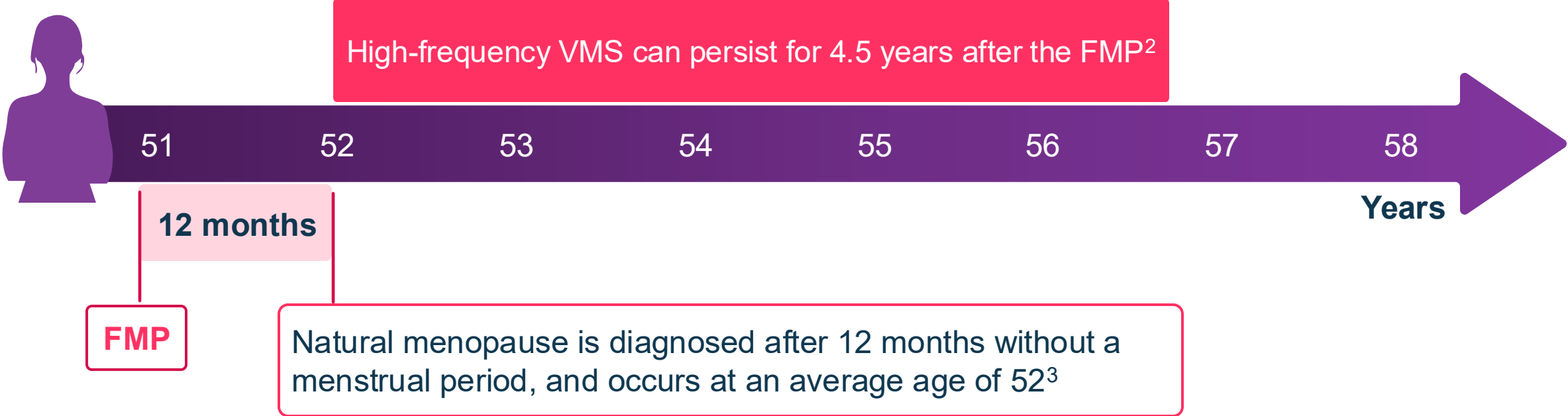
STAGE	-5	-4	-3b	-3a	-2	-1	+1a	+1b	+1c	+2
Terminology	Reproductive				Menopausal Transition		Postmenopause			
	Early	Peak	Late		Early	Late	Early		Late	
					Perimenopause					
Duration	Variable				Variable	1–3 years	2 years (1 + 1)		3–6 years	Remaining lifespan

VMS are most likely to occur during postmenopause¹

VMS MOST LIKELY

SWAN: Duration of VMS

Based on data from the SWAN study,^a high-frequency VMS can persist for 4.5 years after the final menstrual period (FMP)¹



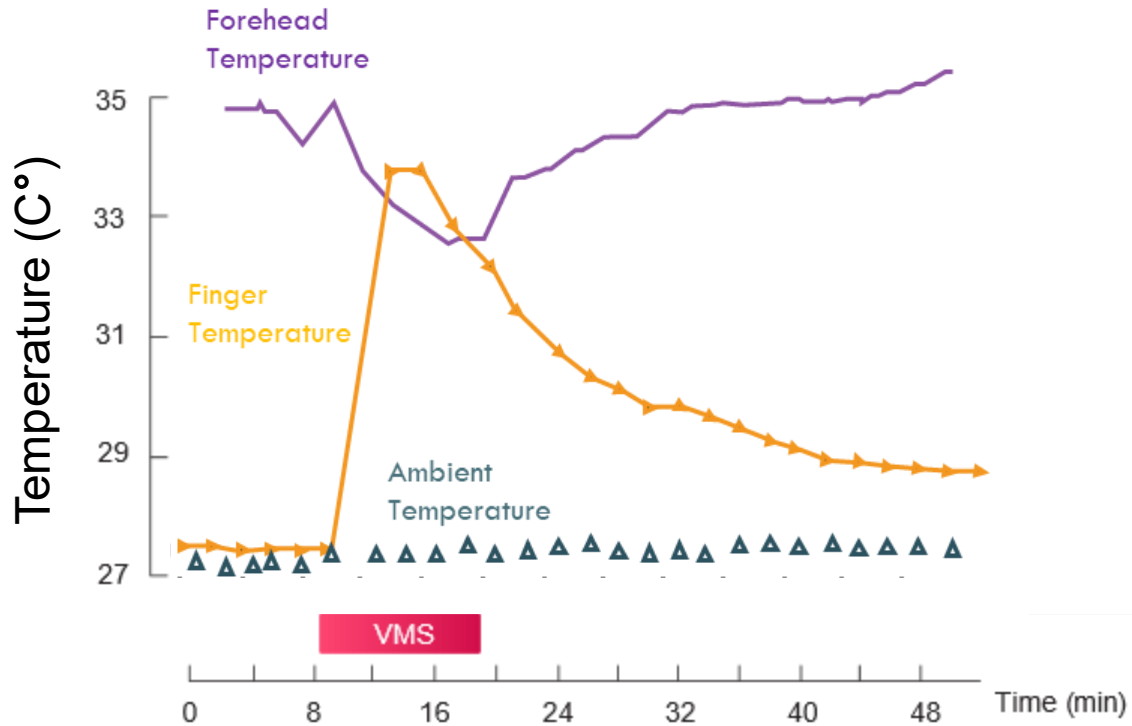
^aStudy of Womens Health Across the Nation: (SWAN) is a multiracial/multiethnic observational study of the menopausal transition among 3302 women enrolled at 7 US sites. From February 1996 through April 2013, women completed a median of 13 visits. Analyses included 1449 women with frequent VMS (>6 days in the previous 2 weeks). Median duration of VMS was evaluated from 881 women who experienced an observable FMP. VMS, vasomotor symptoms.

[1] Avis NE, et al. *JAMA Intern Med.* 2015;175(4):531-539. [2] Davis SR, et al. *Nat Rev Dis Primers.* 2015;1:15004. [3] Menopause. Cleveland Clinic; 2024. <https://my.clevelandclinic.org/health/diseases/21841-menopause> [Accessed Nov 2025].

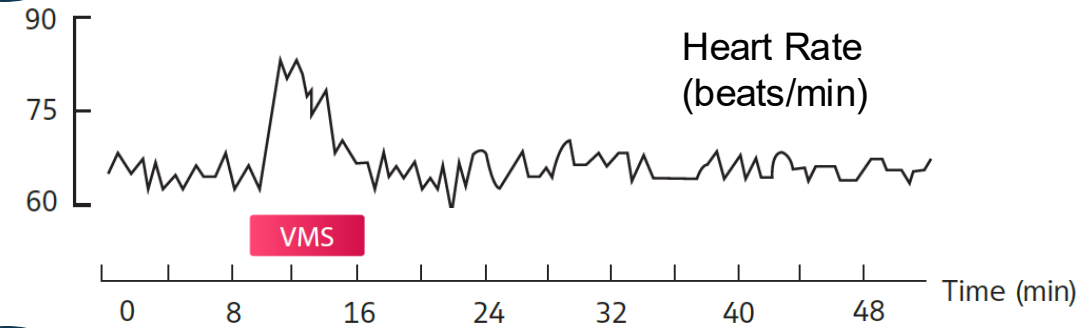
Physiologic Changes During a Hot Flash



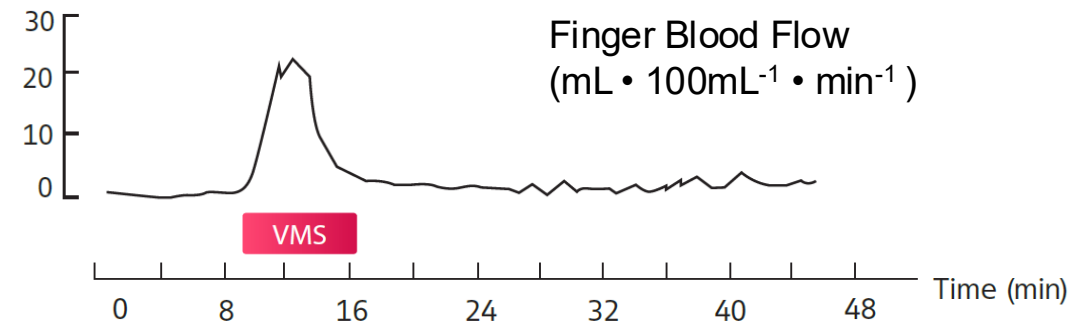
Peripheral body temperature rises quickly during, following the hot flash¹



Heart rate increases from 5 to 25 beats per min¹



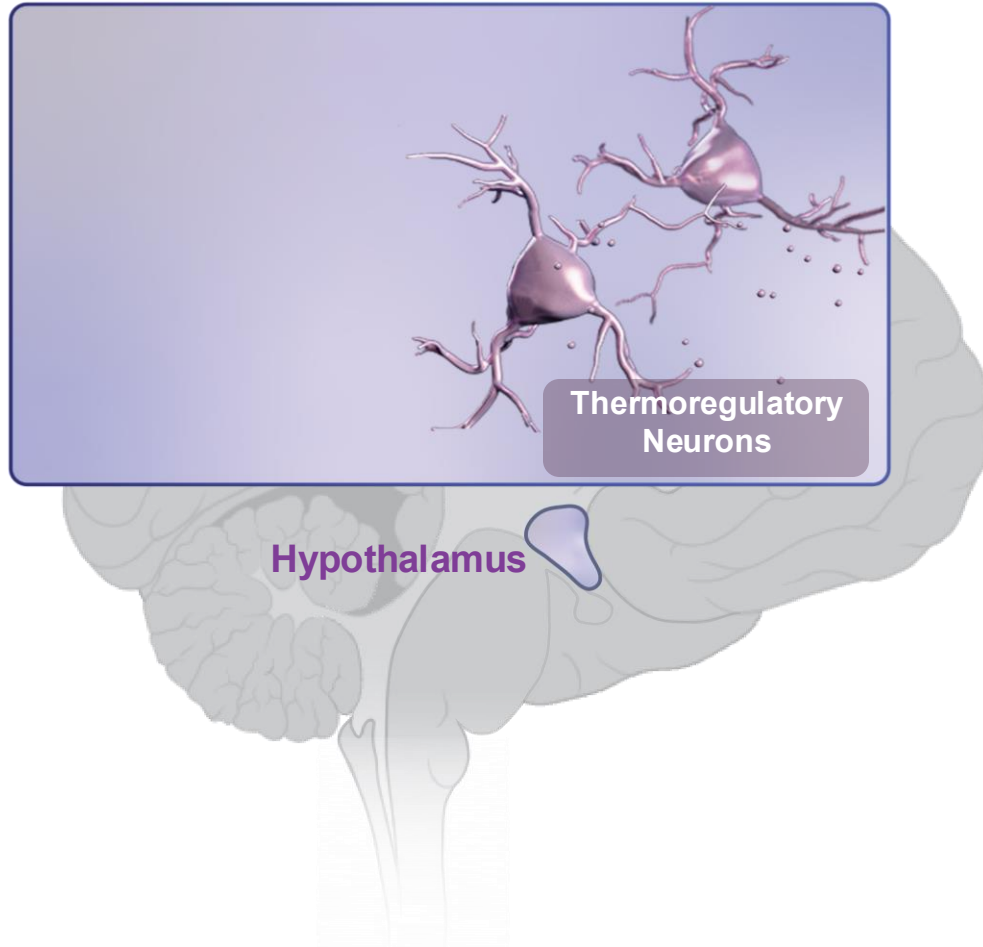
Cutaneous vasodilation occurs with increased blood flow to the skin¹



Figures adapted from: Kronenberg F. *J Nutr.* 2010;140(7):1380S-1385S.
VMS, vasomotor symptoms.

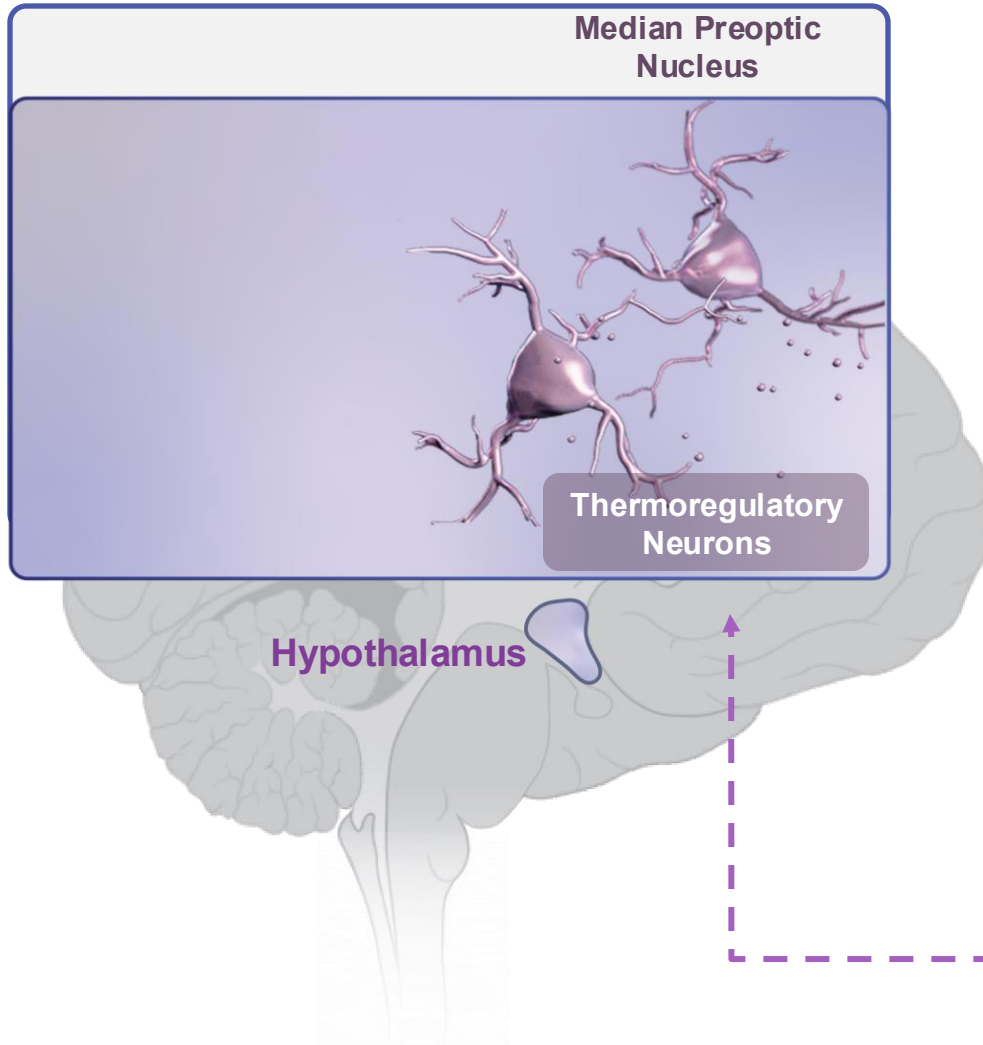
[1] Kronenberg F. *J Nutr.* 2010;140(7):1380S-1385S.

Thermoregulatory Center

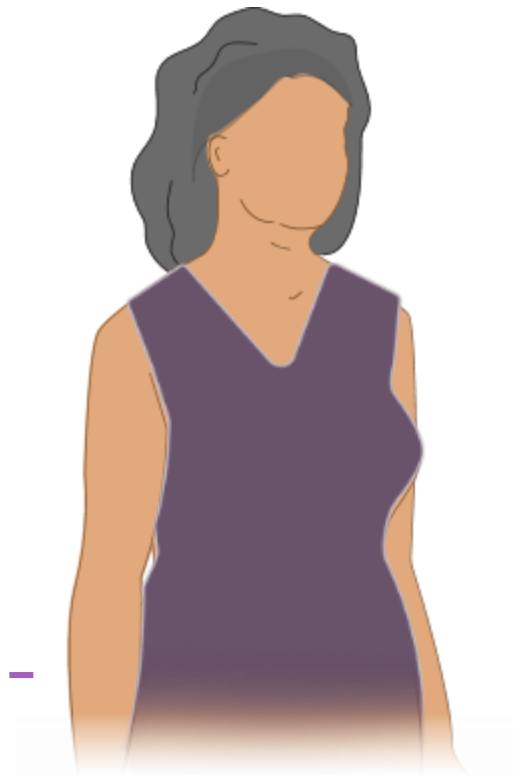


The body's thermoregulatory center is located in the hypothalamus

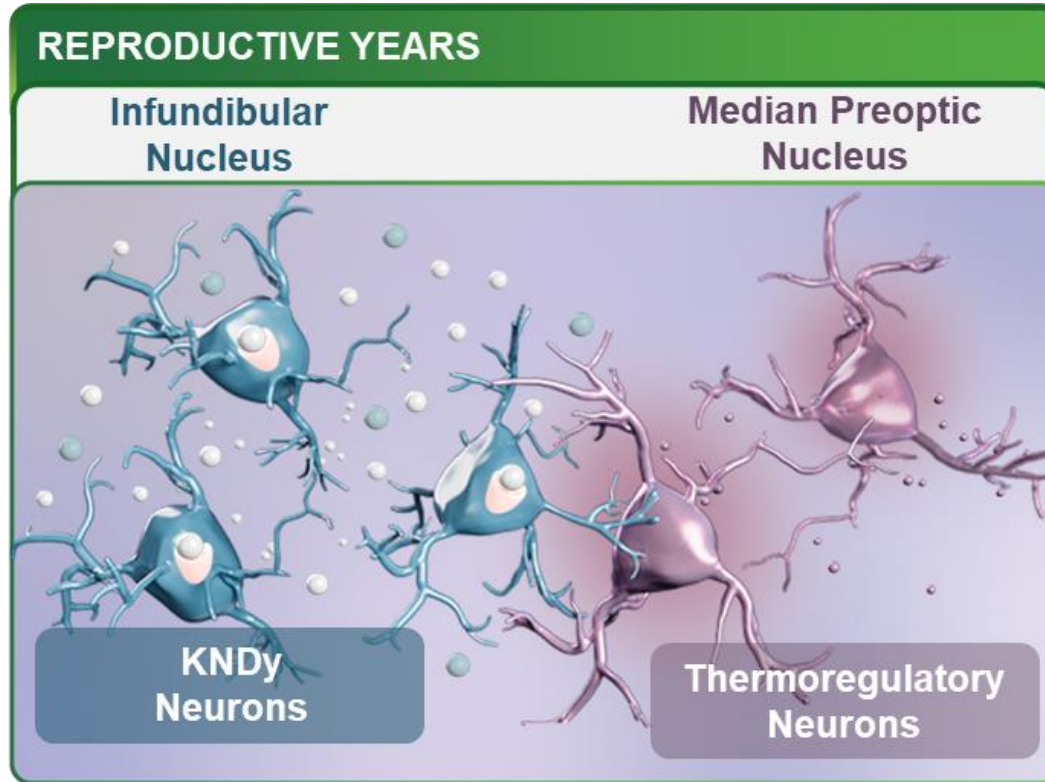
Thermoregulatory Center



Thermoregulatory neurons in the **median preoptic nucleus (MnPO)** receive information from peripheral skin sensors



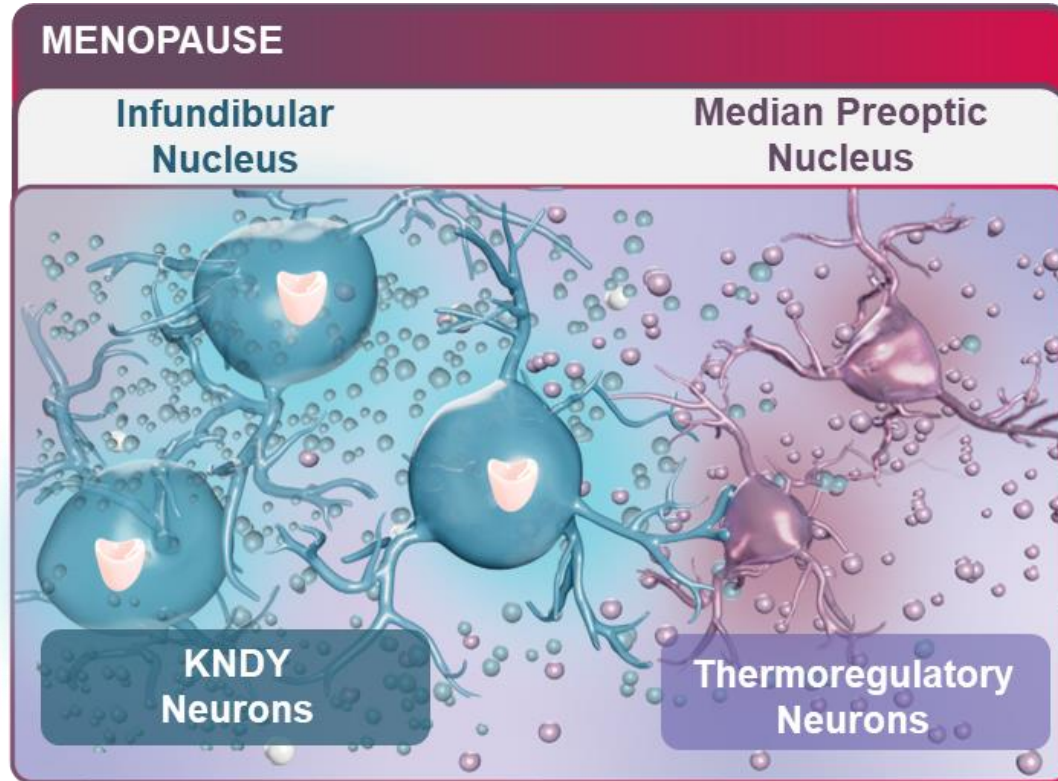
Thermoregulatory Center: KNDy Neurons



Estrogen-sensitive KNDy neurons are located adjacent to the thermoregulatory neurons. KNDy neuron activity is closely regulated by estrogen in the reproductive years

-  Neuropeptides (Kisspeptin, Neurokinin B, Dynorphin, Substance P)
-  Estrogen
-  Estrogen receptor

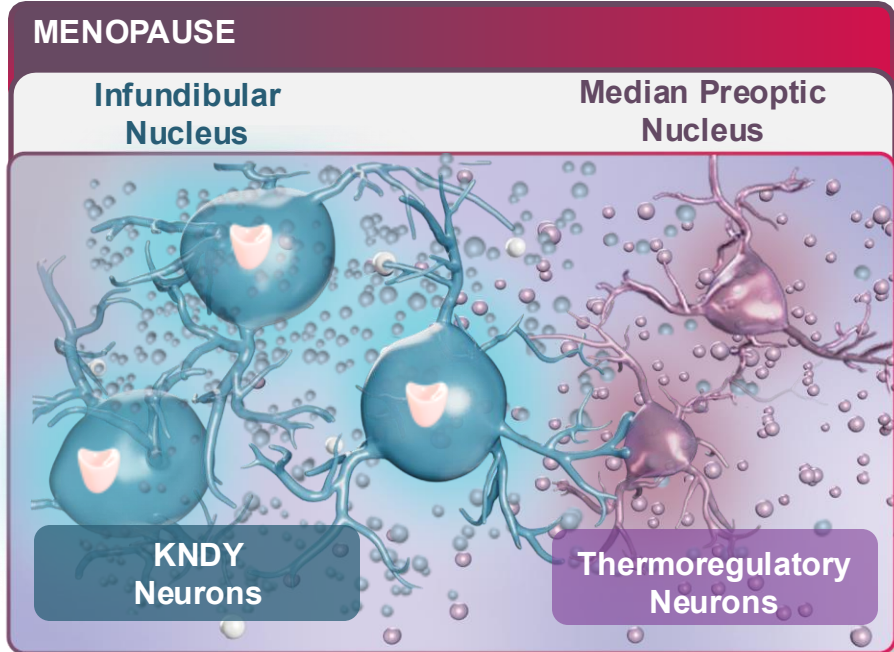
Thermoregulatory Center: Menopause



In menopause, in response to loss of estrogen, **KNDy neurons become enlarged and hyperactive**, overexpressing their neuropeptides

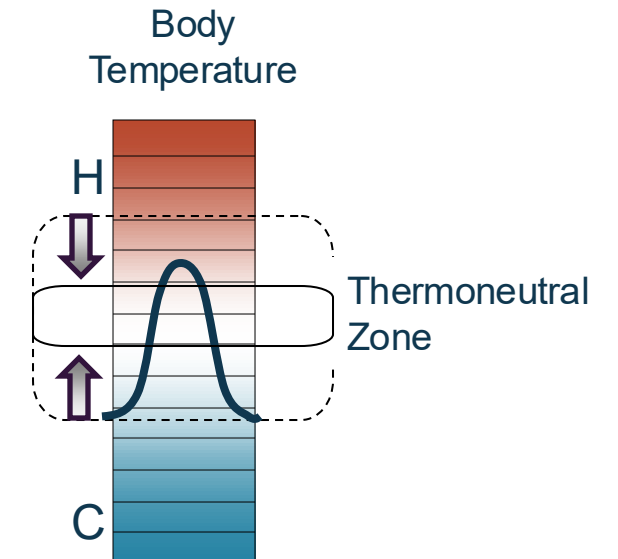
- Neuropeptides (Kisspeptin, Neurokinin B, Dynorphin, Substance P)
- Estrogen
- Estrogen receptor

Thermoregulatory Center: Menopause



Some of these neuropeptides may have a role in mediating VMS of menopause

- Neuropeptides (Kisspeptin, Neurokinin B, Dynorphin, Substance P)
- Estrogen
- Estrogen receptor





AN APPROACH TO COUNSELING PATIENTS ABOUT VMS

Patient Counseling

How the Mayo Clinic and The Menopause Society explain menopause

- // Menopause is a natural process that occurs due to the decline in reproductive hormones.
- // As you get older, your ovaries have fewer eggs, and your fertility declines.
- // With fewer eggs, there are lower levels of estrogen and other hormones.
- // Usually around age 50, you stop producing eggs altogether, and after a year of no periods, you have entered menopause.
- // One of the more common symptoms of menopause are hot flashes, including night sweats.



[1] Menopause. Mayo Clinic; 2024. <https://www.mayoclinic.org/diseases-conditions/menopause/symptoms-causes/syc-20353397> [Accessed Nov 2025].

[2] Menopause topics: symptoms. The Menopause Society; 2025. <https://menopause.org/patient-education/menopause-topics/symptoms> [Accessed Nov 2025].

[3] SWAN fact sheet: hot flash fact sheet. <https://www.swanstudy.org/wps/wp-content/uploads/2023/04/SWAN-Fact-Sheets-Hot-Flashes.pdf> [Accessed Nov 2025].

Patient Counseling

How the Mayo Clinic explains hot flashes

“Hot flashes are caused by changing hormone levels before, during, and after menopause.

Most research suggests that hot flashes occur when decreased estrogen causes your body’s thermostat (located in your brain) to become more sensitive to slight changes in body temperature.

When this thermostat in your brain thinks your body is too warm, it starts a chain of events—a hot flash to cool you down.”





Shared Decision-Making

Shared decision-making is a **patient-centered, individualized approach** to the informed consent process that involves discussion of the benefits and risks of available treatment options in the context of a patient's values and priorities.

Patients are encouraged to share information, express value-based preferences, and **provide input on a treatment plan.**

Shared decision-making allows patients to obtain personalized information about their treatment options, **with the goal of improving their ability to make an autonomous decision.**

Shared Decision-Making

SHARE Model (Seek-Help-Assist-Reach-Evaluate)



- // Throughout counseling, use of decision aids may increase patient knowledge, understanding of risk, reduce decisional uncertainty, and lead to care that more closely represents the patient's values
- // Decision aids are intended to complement the discussion and do not replace the interaction between the patient and healthcare professional



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