Take Health to Heart:

The Missing Beat: Rewriting the Story of Women's Heart Health.

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Learning Objectives

By the end of this session, participants will be able to:

1. Identify key sex-specific and pregnancy-related cardiovascular risk factors across the female life course, including reproductive, perimenopausal, and postmenopausal periods.
2. Interpret adverse pregnancy outcomes as early indicators of future cardiovascular disease risk.
3. Implement evidence-based screening and risk-reduction strategies within their practice, including cardiovascular risk assessment, laboratory evaluation, and appropriate referrals.
4. Apply a life-course and equity-focused framework to recognize populations at increased risk and incorporate prevention counseling into routine care.

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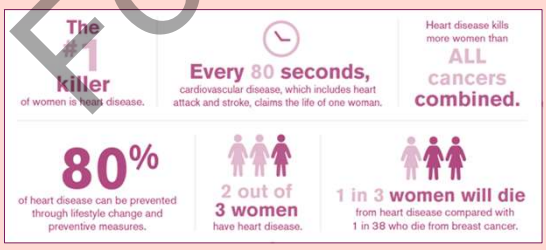
Did you know?



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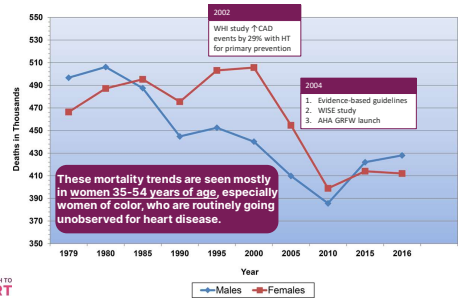
Cardiovascular disease is an equal opportunity killer: mortality trends in men and women.



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Emelia J. Benjamin. Circulation. Heart Disease and Stroke Statistics—2019 Update: A Report From the American Heart Association. Volume: 137, Issue: 12, Pages: e67-e492.

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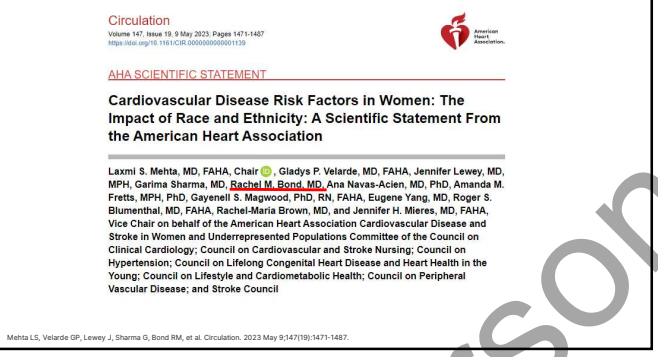

Circulation
Volume 147, Issue 19, 9 May 2023, Pages 1471-1487
https://doi.org/10.1161/CIR.0000000000001139

American Heart Association.

AHA SCIENTIFIC STATEMENT

Cardiovascular Disease Risk Factors in Women: The Impact of Race and Ethnicity: A Scientific Statement From the American Heart Association

Laxmi S. Mehta, MD, FAHA, Chair, Gladys P. Velarde, MD, FAHA, Jennifer Lewey, MD, MPH, Garima Sharma, MD, Rachel M. Bond, MD, Ana Navas-Acien, MD, PhD, Amanda M. Fretts, MPH, PhD, Gayenell S. Magwood, PhD, RN, FAHA, Eugene Yang, MD, Roger S. Blumenthal, MD, FAHA, Rachel-Maria Brown, MD, and Jennifer H. Mieres, MD, FAHA, Vice Chair on behalf of the American Heart Association Cardiovascular Disease and Stroke in Women and Underrepresented Populations Committee of the Council on Clinical Cardiology; Council on Cardiovascular and Stroke Nursing; Council on Hypertension; Council on Lifelong Congenital Heart Disease and Heart Health in the Young; Council on Lifestyle and Cardiometabolic Health; Council on Peripheral Vascular Disease; and Stroke Council

Mehta LS, Velarde GP, Lewey J, Sharma G, Bond RM, et al. Circulation. 2023 May 9;147(19):1471-1487.

5

Reasons women face disparities in CVD risk factors, prevalence, and mortality?

Bikini Medicine- medical research & management has ignored the needs of women aside from the breast and reproductive health.[1]

'Yentl syndrome' noted by **Dr. Bernadine Healy** called to attention the paradox of adverse outcomes of women with IHD when treated as "**little men**", & the under-diagnosis and under-treatment of women.[2]

Despite the slight majority of female medical students & IM residents, women are under-represented in cardiology. [6]

Women are under-represented in clinical trials with at best **30% enrollment** in CAD and CHF trials.[5]

Public awareness and education of women and health care clinicians continues to lag, with awareness in **2009 at 65%**, compared to **44% in 2019** in the community and only **22% of PCPs** and **42% of cardiologist** feeling well-prepared to assess CVD risk in women.[3,4]

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Wenger Puts Women at Heart of Research. https://nihrecord.nih.gov/2018/07/13/wenger-puts-women-heart-research 2. Healy B. The Yentl syndrome. *N Engl J Med.* 1991 Jul 25;325(4):274-6.2019. 3Bairey Merz CN, et al. the Women's Heart Alliance. J Am Coll Cardiol. 2017; 70:123–132. 4. Cushman M, et al. Circulation. 2021 Feb 15; 143(7): e239-e248 5. Vogel B, et al. Lancet. 2021 Jun 19; 397 (10292): 2385-2438. 6. To Improve Cardiac Outcomes for Women, Increase Representation. https://www.commonwealthfund.org/publications/podcast/2023/jul/improve-cardiac-outcomes-women-increase-their-representation

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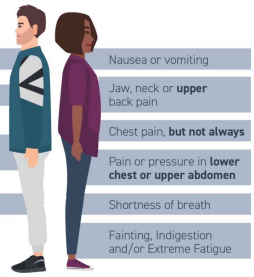
The most common symptom of a heart attack for both men and women is chest pain, but women may experience less obvious and more associated warning signs.

The **use of "atypical" is no longer suggested as it may lead to delays in diagnosis.**

To diminish ambiguity, use "**cardiac**", "**possibly cardiac**", and "**non-cardiac**" to describe the suspected cause of chest pain.



Nausea or vomiting	Nausea or vomiting
Jaw, neck or back pain	Jaw, neck or **upper** back pain
	Chest pain, **but not always**
Squeezing chest presusure or pain	Pain or pressure in **lower chest or upper abdomen**
Shortness of breath	Shortness of breath
	Fainting, Indigestion and/or Extreme Fatigue

Source: CardioSmart. American College of Cardiology.
Gulati M, et al. Circulation. 2021 Nov 30;144(22):e368-e454.

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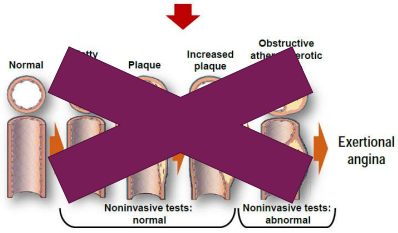
Objective of Anti-Anginal Strategies: Male-Pattern Model

Reduce Ischemia & Relieve Symptoms



Gibbons ACC/AHA 2002 guidelines., www.acc.org/clinical/guidelines/stable/stable.pdf., Abrams NEJM 2005;352:2524-33

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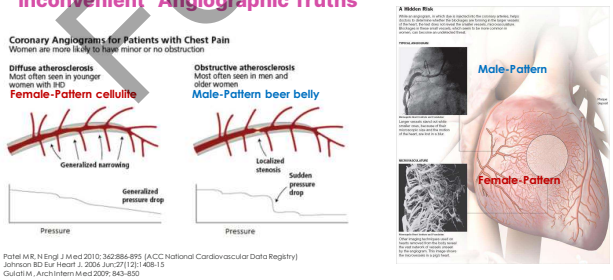
Sex differences in symptoms may translate into differences in pathophysiology.

"Inconvenient" Angiographic Truths



Patel MR, N Engl J Med 2010; 362:886-895 (ACC National Cardiovascular Data Registry)
Johnson BD Eur Heart J. 2006 Jun;27(12):1408-15
Gulati M., Arch Intern Med 2009; 843-850

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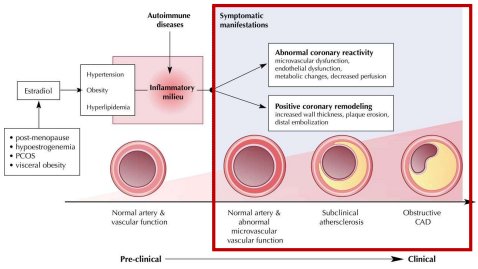
A changing philosophy is required to understand the different pathophysiology of ischemic heart disease (IHD) in women.



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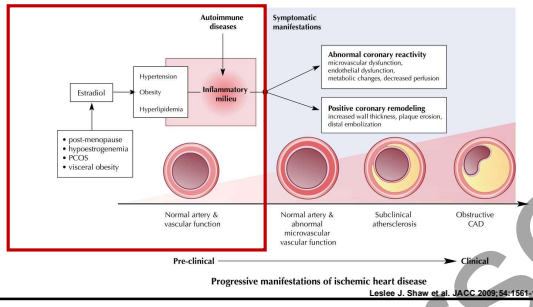
A changing philosophy is required to improve outcomes of IHD in women, especially women of reproductive age ideally before the onset of conventional cardiometabolic risk factors.



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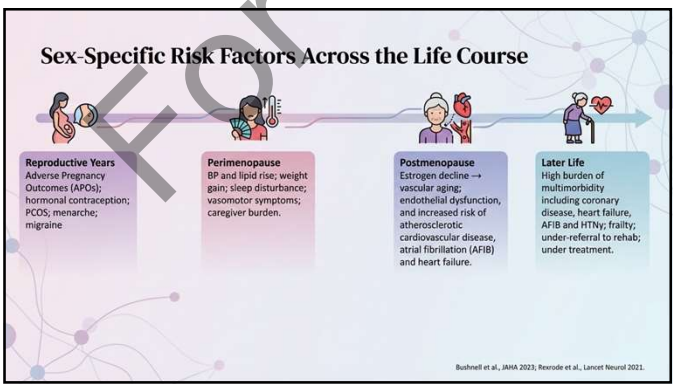
Sex-Specific Risk Factors Across the Life Course



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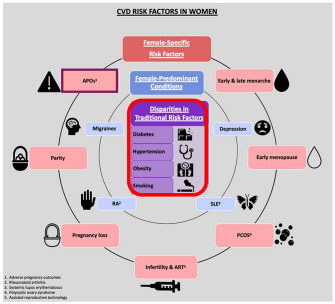
Unique Risk Factors Across the Life Course for CVD in Women

[1]



[2]

1. Rajendran A, et al. Atherosclerosis [In Press]. 2023 2. Sharma G, et al. J Am Heart Assoc. 2020;9:e015569.

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Pregnancy

Maternal and Cardiovascular Intersection

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Heart Disease & Pregnancy

- Up to **4%** of pregnancies may have cardiovascular complications, despite no known prior disease.
- In the US, **CVD** is the **leading cause of death during pregnancy and the postpartum period**, responsible for **26.5%** of all pregnancy-related mortalities, with rates of mortality and morbidity highest among women of color, and those with lower income [**Black women, across all sociodemographics, are 2-3X more likely to die**]. This is despite being largely preventable 80% of the time.
- CV disease does not preclude pregnancy but poses ↑ risk to both mother and fetus.

Source: CDC

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Cardiovascular Change in Pregnancy

Parameter	Percentage of Change
Intravascular Volume	40-45% ↑
Cardiac Output	40-50% ↑
Heart Rate	10-20% ↑
SVR	20% ↓ (as ↑uterine blood flow)
Stroke Volume	30% ↑
Systolic BP	→ Or ↓
Diastolic BP	20% ↓ at mid-pregnancy
O2 Consumption	30-40% ↑
Venous Pressure in lower extremities	↑

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Pregnancy & Heart Disease

- By the 32nd week, maternal CO is approx 40% above the pre-pregnancy level and stays at this level until birth.
- During Delivery, there is an additional ↑ in HR and BP→ further ↑ in CO as much as 80% above the pre-pregnancy level.
- Often the first, but unequivocally the most important **cardiac stress test** a woman has in her life.

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Maternal Risk

- Risk of cardiac complications can be estimated by **history**, exam, imaging
- Risk Estimation using predictors
  - CARPREG (CARdiac disease in PREGnancy) group
  - ZAHARA (largely for congenital heart disease)
  - ROPAC (Registry of Pregnancy AND Cardiac disease)
- Much of our risk estimation comes from the CARPREG group, with most utilizing **CARPREG 2** along with modified World Health Organization (**mWHO**) to best risk stratify.

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Critical periods

- Changes start from as early as – 5-6 weeks
- Max changes around –30-32 weeks
- Intrapartum period
- Just after delivery
- Second week of puerperium

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Pregnancy Related Disorders & CVD Risk Association-

The Evidence to Date:

- GDM: Level 1A evidence as a RF for DM (**>7X**)
- HDP: Level 1A evidence as RF for DM (**1.8X**)
- HDP: Level 1A as RF for HTN (**3.7X**)
- Preeclampsia: Level 1A RF for CVD/Mortality (**2X**)
  - >>> risk with recurrent episodes or preterm preeclampsia
- GDM: Level 1B as a RF for CVD/Mortality (**1.7X**)

GDM- gestational diabetes mellitus; RF- risk factor; HDP- hypertensive disorder of pregnancy

Level of evidence based on Oxford classification.

	Type 2 DM	HTN	CVD Events
GDM	1a	ND	1b
Preeclampsia	1a	1a	1a
G-HTN	1a	1b	1a

Nerenberg Nett al. Canadian Journal of Cardiology 2014;1-14.
Seely EW, et al. J Womens Health (Larchmt). 2021 March; 30(3): 305-313.

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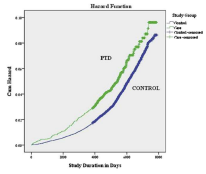
Preterm Delivery (PTD) and CVD Hospitalizations

- Cohort (N=47,908):

Women who delivered preterm (<37 weeks' gestation)

[N=5992 (12.5%)] vs. Normal term birth at the same period

- During a follow-up period of >10 years, patients with **PTD** had **higher rates** of simple and complex **cardiovascular events** and higher rates of total **cardiovascular-related hospitalization.**



Kessous et al. An association between preterm delivery and long-term maternal cardiovascular morbidity. Am J Obstet Gynecol. 2013; 209(6): 568.

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Preterm Delivery and CVD Risk: NHS II

- Women who deliver their first child preterm (<37 weeks) experience a 40% increased risk of CVD
- Women with a **very preterm first birth** (<32 weeks) have **double the risk**; <25% of this increased risk is explained by HTN, hypercholesterolemia, DMII, Change in BMI after pregnancy.

Tanz Li et al. Circulation. 2017; 135: 578-589.

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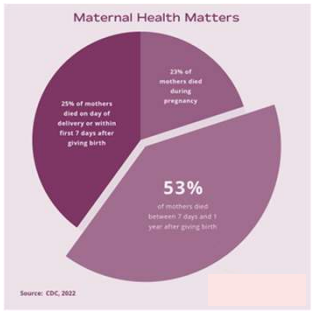

Cardiomyopathy represents **45% of all pregnancy-related deaths** between **6 weeks and a year postpartum**.

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Postpartum-Key Points

Immediate Postpartum:
- Monitoring minimum 48 hours
- Medications safety with lactation
- Assess and treat cardiac complications
- Patient counseling on symptoms of complications

Fourth Trimester:
- 3-7 days follow-up post-discharge
- Comprehensive evaluation within 6 weeks (including mental health screening)
- Contraception counseling

Long-Term:
- Transitions of care for closer and ongoing assessment, interconception optimization or post-child bearing care
  - Cardiometabolic risk screening within 3 months postpartum for women with APOs, with repeat 6-12 months postpartum after implementation of appropriate lifestyle interventions

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Davis et al. J Am Coll Cardiol 2021; 77:1763-1777.
Cho L, et al. J Am Coll Cardiol. 2020 May 26;75(20):2602-2618.
"ACOG practice bulletin no. 212: pregnancy and heart disease". Obstet Gynecol 2019;133:e320-e356.

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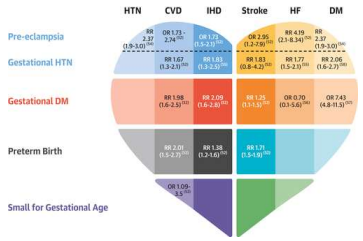
Pregnancy can be a window to one's future cardiovascular health, and identification of APOs that can ↑ risk of future pregnancies and long-term CV health is important, especially if assessed and managed prior to the onset of conventional risk factors.



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Davis MB, et al. *J Am Coll Cardiol* 2021; 77:1763-1777.

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Clinical Cardiology Update

Topic Update

Weighing Adverse Pregnancy Outcomes and Future Cardiovascular Risk

Rachel M. Bond, MD, FACC

"CVD prevention in women needs an updated approach — one that includes standard screening for [adverse pregnancy outcomes] as early as possible."
— Rachel M. Bond, MD, FACC

Rachel M. Bond, MD, FACC, is a board-certified attending cardiologist in Arizona whose clinical interests include heart health prevention and maternal health. She is System Director of the Women's Heart Health Program at Dignity Health; Assistant Director of Diversity, Equity, and Inclusion at Dignity Health East Valley Internal Residency Program; and Assistant Professor of Internal Medicine at Creighton University School of Medicine. **Disclosures:** Dr. Bond has nothing to disclose.

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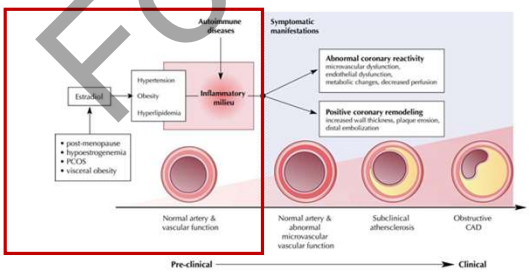
A changing philosophy is required to improve outcomes in women, especially women of reproductive age ideally before the onset of conventional cardiometabolic risk factors.



Progressive manifestations of ischemic heart disease

Leslee J. Shaw et al. JACC 2009;54:1561-1575

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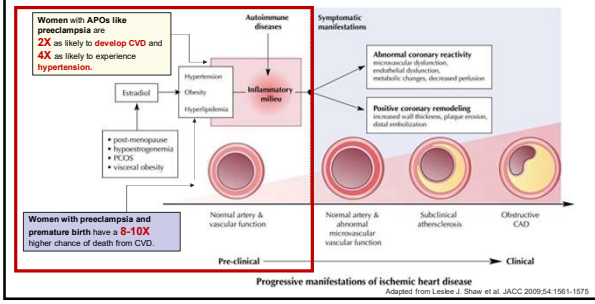

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Perimenopause Menopause

Women's Health and Cardiovascular Intersection

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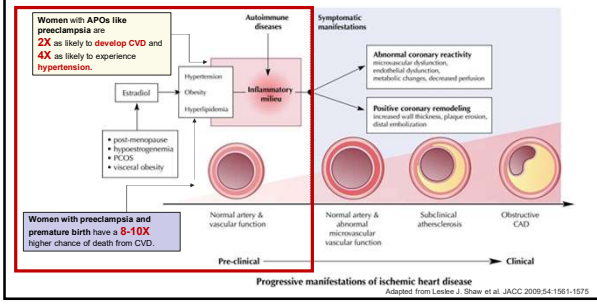

Adapted from Leslee J. Shaw et al. JACC 2009;54:1561-1575

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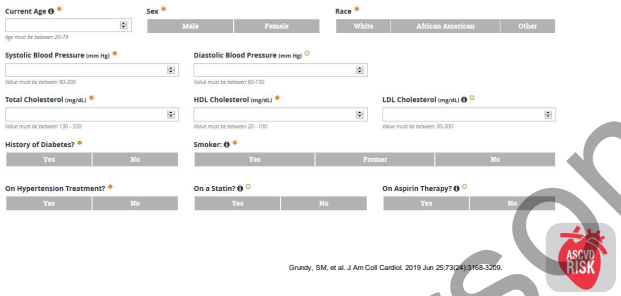
ACC/AHA Risk Calculator is NOT Capturing Younger Women:
Atherosclerotic Cardiovascular Disease (ASCVD) Risk Calculator



Grundy, SM, et al. J Am Coll Cardiol. 2019 Jun 25;73(24):3168-3209.

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Why are we STILL not capturing the ASCVD risk in women?

What are we missing?

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ACC/AHA Guidelines:
Risk-Enhancers for ASCVD

- Family history of premature ASCVD
- Persistently elevated LDL-C ≥160 mg/dL
- Chronic kidney disease
- Metabolic syndrome
- **Conditions specific to women (e.g., gestational diabetes, preeclampsia, premature menopause, post-menopausal state)**
- Inflammatory disease (generally **more common in women**)
- Ethnicity (e.g., South-Asian ancestry)

Grundy, SM, et al. J Am Coll Cardiol. 2019 Jun 25;73(24):3168-3209.

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Premature/Early Menopause

Earlier age of menopause is consistently associated with greater risks of stroke/TIA, coronary heart disease (CHD), heart failure, CVD mortality, and all-cause mortality.

- Women experience menopause at a median age of 50.0 years (interquartile range, 48.0–53.0 years) .
- However, **7.3% of women** experience menopause between the ages of 40 and 45 (**early menopause**) and **1.9%** before the age of 40 (**premature menopause**).
- Black women are more likely to experience menopause earlier than White or Hispanic women, contributing to longer duration of menopausal symptoms and associated (cardiovascular) risks.

Zhu, D et al. *PLoS Med.* 2018;15:e1002704.
Nowakowski, ACH, et al. *J Racial Ethn Health Disparities.* 2017;4:419-427.
Honigberg, MC, et al. *JAMA.* 2019;322:2411-2421.
Ley, SH, et al. *J Am Heart Assoc.* 2017;6:e007375.
Muka, T, et al. *JAMA Cardiol.* 2016;1:767-776.

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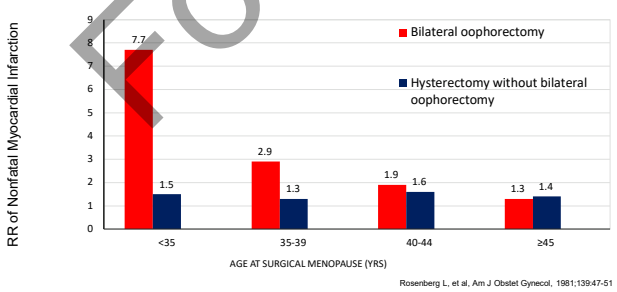
Surgical Menopause: The Younger the Women, the Greater the Concern



Rosenberg L, et al, Am J Obstet Gynecol, 1981;139:47-51

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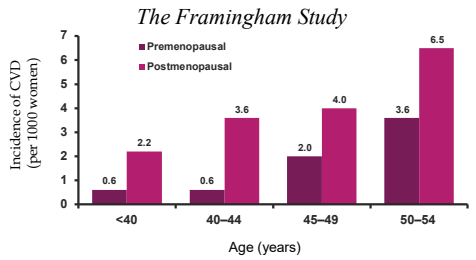
Incidence of CVD: Relation to Menopause Status with 2-to 6-times Higher Incidence in Postmenopausal Women



Kannel WB, et al. *Ann Intern Med.* 1976;85:447-52.

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Grundy, SM, et al. J Am Coll Cardiol. 2019 Jun 25;73(24):3168-3209.

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Cardiovascular Implications of Menopause

CVD Risk Factors

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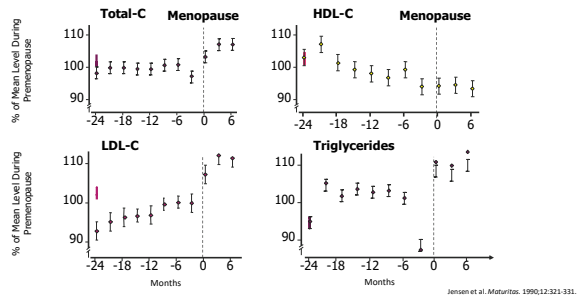
Change in Lipids After Menopause



Jensen et al. *Maturitas.* 1990;12:321-331.

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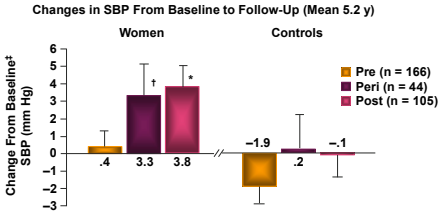
BP Rises After Menopause → 3X >Risk of HTN



*$P \leq .05$; †$P = .07$. ‡Baseline SBP: Pre = 121.4 ± 1.3 mm Hg; Peri = 122.0 ± 1.8 mm Hg; Post = 126.5 ± 1.7 mm Hg. Controls were men matched by age and BMI.

Staessen JA, et al. *J Hum Hypertens.* 1997;11:507–514.

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Postmenopausal Hypertension

1. **Estrogen is a potent vasodilator**
   a. Relaxes vascular smooth muscle cells, by increasing nitric oxide

2. **Studies have shown that menopause ↑ salt-sensitivity → to an ↑ in BP**

3. **Loss of Estrogen → Renin-Angiotensin-Aldosterone System activation**
   a. Increased number of Angiotensin 1 (AT1) receptors
   b. Increased expression and activity of angiotensin-converting enzyme (ACE)
   c. Reduced plasma renin levels

- **Clinical Takeaway:** The combined effects of vascular stiffening, heightened salt sensitivity, and RAAS overactivation after endogenous estrogen loss accelerate hypertension development, directly increasing postmenopausal women's lifetime cardiovascular disease risk.

Oparil S, Miller AP. J Clin Hypertension (Greenwich) 2005; 7: 300-307.
Reckelhoff JF. Hypertension. 2005; 45: 170-174.
Nickenig G et al. Circulation. 1998; 97: 2197-2201.

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Vasomotor Symptoms

As a Risk Factor for Cardiovascular Disease.

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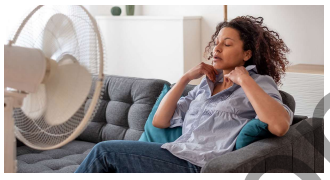
More than 70% of women report vasomotor symptoms (VMS) at some point during midlife.



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A Dose-Dependent Relationship between Severity and Frequency of VMS and CVD Risk Factors

1. **Women with VMS have a worse overall cardiovascular risk profile**
   a. LDL-C, apolipoprotein B, triglycerides, HDL-C and apo A_1 levels
   b. ↑future risk of hypertension, insulin resistance, and diabetes, independent of obesity
2. **Women with VMS are at ↑ risk of subclinical CVD**
   a. increased carotid intima-media thickness, endothelial dysfunction, and arterial calcification
3. **Women with VMS have a ↑ risk for the development of clinical CVD events**
   a. A large meta-analysis reported a **28% ↑ risk of CVD** after adjusting for traditional risk factors
   b. A prospective cohort study of 11,725 women (aged 45–50 years at baseline) reported **2-fold increased odds of CVD in women with frequent VMS** relative to women without symptoms

Franco, Oh, et al. *Maturitas*. 2015;81:353–361.
Thurston ,RC, et al. *Obstet Gynecol*. 2012;119:753–761.
Jackson, EA, et al. *J Womens Health (Larchmt)*. 2016;25:1204–1209.
Herber-Gast, GC, et al. *Menopause*. 2014;21:855–860.
Muka, T, et al. *PLoS One*. 2016;11:e0157417.

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Menopause, VMS & Cardiovascular Risk

1. **Onset of VMS is important in CVD risk**
   a. Early-onset VMS: starts before or at menopause [HR ~1.38]
   b. Late-onset VMS: beginning after menopause [HR ~1.69].
2. **VMS severity more predictive of CVD risk than frequency, and timing alone.**
   a. Severe VMS: HR ~2.11 for future CVD events.
3. Metabolic syndrome and other **cardiometabolic risk factors** (e.g., hypertension, dyslipidemia, insulin resistance, obesity) **amplify vascular risk the greatest of all factors, creating the highest-risk phenotype**. These overlapping risks suggest that VMS may act both as a marker of underlying vascular vulnerability and as a potential mediator of cardiovascular changes during the menopausal transition.

Zhu D, et al. Menopause. 2020;27(1):24-32. https://doi.org/10.1097/GME.0000000000001421
Park Y, et al. Association between metabolic syndrome and vasomotor symptoms in postmenopausal women. Menopause. 2021;28(5):528-534. https://doi.org/10.1097/GME.0000000000001748

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Who is appropriate to consider for menopausal hormone therapy (MHT)? What is the current data on risk/benefits?

"H..has your hot flush gone yet, c..can we close the window now?"

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What Experts Want BIPOC Women to Know About Menopause

September 16, 2020

New research suggests that **women of color tend to enter perimenopause and menopause at earlier ages than their White peers, have longer transition periods, and experience more intense hot flashes and vaginal symptoms.**

https://www.everydayhealth.com/menopause/what-experts-want-bipoc-women-to-know-about-menopause/

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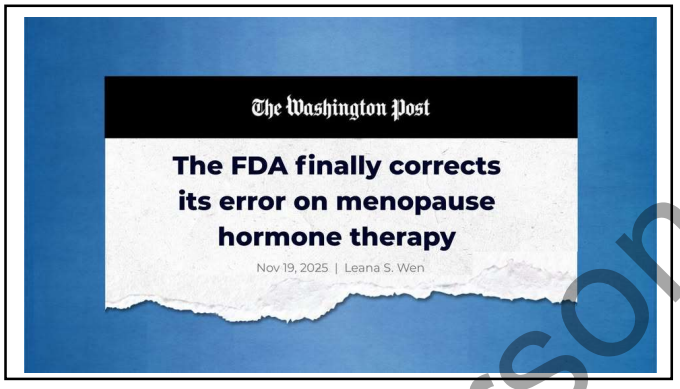

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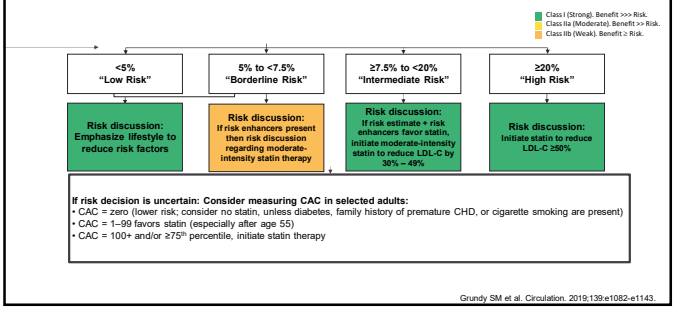
2018 AHA/ACC Guideline on the Management of Blood Cholesterol: Primary Prevention



Grundy SM et al. Circulation. 2019;139:e1082-e1143.

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Contemporary approach to prescribing MHT and MHT risk assessment.
MHT is appropriate for treatment of VMS in women who are otherwise healthy at the time of menopause, within 10 y of menopause, and under age 60 y. However, the decision to prescribe MHT should still consider a woman's individual CVD risk factors and employ a shared decision-making approach.

1. Evaluate age, time since menopause, and symptoms

<10 year from final menstrual cycle, <60 years old, and bothersome vasomotor symptoms

2. Perform ASCVD risk assessment and exclude HT contraindications

ASCVD risk factors

- Hyperlipidemia
- Hypertension
- Diabetes
- Family history of premature CVD in first-degree relative (men <55 or women <65 years of age)
- Obesity (BMI >30 kg/m²)
- Physical inactivity
- Cigarette smoking
- Coronary calcification (moderate risk: CAC 1-99; high risk: CAC >100)
- History of preeclampsia
- History of systemic autoimmune collagen-vascular disease (e.g., lupus, rheumatoid arthritis)

Contraindications to systemic HT:

Coronary heart disease, stroke, TIA
Breast or endometrial cancer
History of pulmonary embolus, venous thrombosis or clotting disorder
Active liver disease
Undiagnosed abnormal vaginal bleeding

3. Evaluate risk category

May consider HT	*May consider HT, transdermal formulation*	*Not recommended to use HT:*
ASCVD risk <5% (low risk) and ≤1 CVD risk factor	ASCVD risk 5-10% or ASCVD risk <5% but ≥2 CVD risk factors	Age ≥60 or >10 years since menopause onset or ASCVD risk >10%

4. Ensure routine follow-up with re-evaluation of risks and benefits

O'Kelly AC, et al. *Circ Res* 2022;130 (4):652-672.

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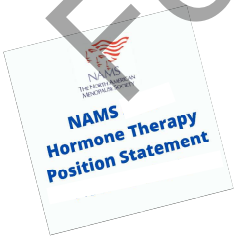
2023 Menopause Position Statement



Appropriate dose, duration and route of administration

For appropriate symptoms based on an individual women

The 2017 Hormone Therapy Position Statement of The North American Menopause Society. *Menopause*. 2017;24(7):728-753.
The 2022 Hormone Therapy Position State of the NAMS. Menopause: The Journal of The NAMS. 2022; Vol. 29, No. 7, pp. 767-794

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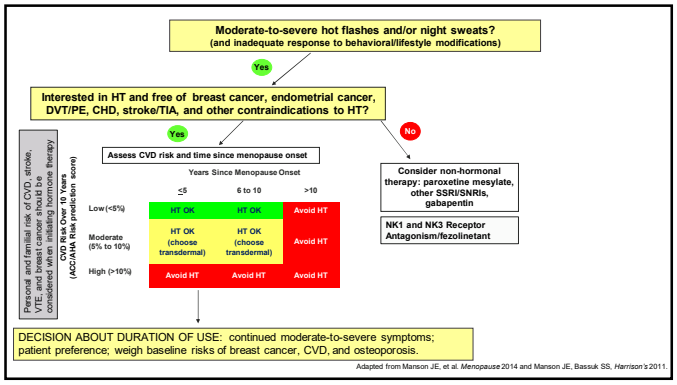

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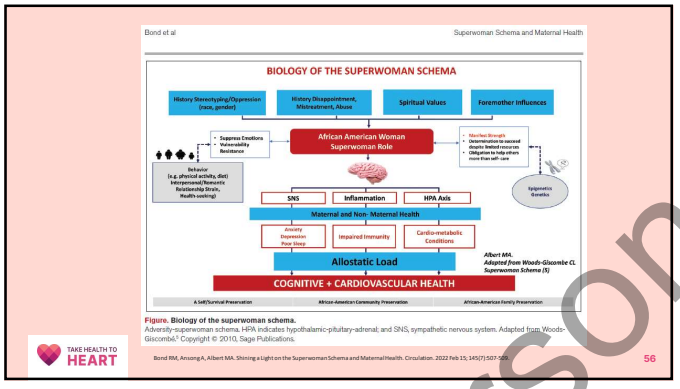

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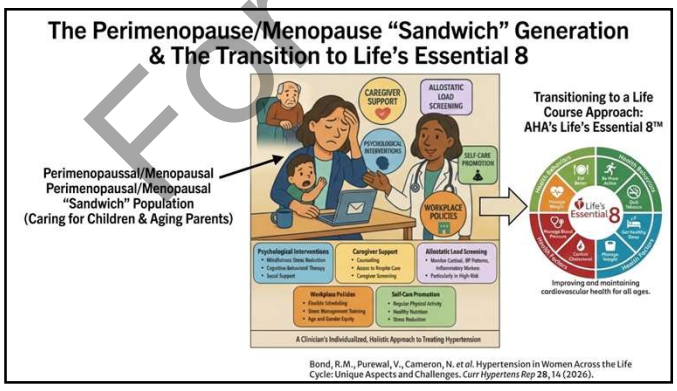

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2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/ AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults

Important as BP is the most common modifiable risk factor which impacts women across all life stages.

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Definition and Classification of Blood Pressure

Blood Pressure Category	SBP		DBP
Normal	< 120 mmHg	and	< 80 mmHg
Elevated	120 to 129 mmHg	and	< 80 mmHg
Hypertension			
Stage 1 Hypertension	130 to 139 mmHg	or	80 to 89 mmHg
Stage 2 Hypertension	≥ 140 mmHg	or	≥ 90 mmHg

COR	RECOMMENDATIONS
1	In adults, BP should be categorized as normal, elevated, or stage 1 or stage 2 hypertension to prevent and treat high BP.

Abbreviations: BP indicates blood pressure; DBP, diastolic blood pressure; and SBP, systolic blood pressure.

Jones, D.W., et al. (2025). 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. *Circulation*.

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Diagnostic Criteria for Preeclampsia

Diagnostic Criteria for Preeclampsia

Blood pressure AND **Proteinuria** OR **Other Criteria**

Either of the following:
- SBP≥140 mmHg AND/OR DBP≥90 mmHg on 2 occasions 4 hours apart >20 weeks gestation in a woman with previously normal BP
- SBP ≥160 mmHg OR DBP ≥110 mmHg (confirmed over 15 min)

Any of the following:
- ≥300mg per 24 h urine collection
- Protein/creatinine ratio ≥0.3
- Dipstick reading of 2+ (if other quantitative methods not available)

Any of the following:
- Thrombocytopenia (platelet count <100k)
- Reduced kidney function (serum creatinine>1.1 mg/dL or 2x baseline creatinine)
- Impaired liver function (transaminases >2x ULN)
- Pulmonary edema
- New-onset headache unresponsive to medication OR visual symptoms

Abbreviations: BP indicates blood pressure; DBP, diastolic blood pressure; SBP, systolic blood pressure; and ULN, upper limit of normal.

Jones, D.W., et al. (2025). 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. *Circulation*.

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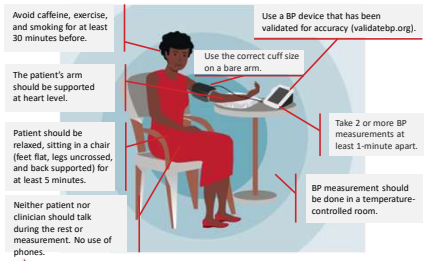
Best Practices for Accurate In-Office and Self-Monitored Blood Pressure Measurement



COR	RECOMMENDATIONS
1	When diagnosing and managing high BP in adults, standardized methods are recommended for the accurate measurement and documentation of in-office BP.
2a	When measuring in-office BP in adults, it is reasonable to use the oscillometric method with an automated device over the auscultatory method.

Abbreviation: BP indicates blood pressure.

Jones, D.W., et al. (2025). 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. *Circulation*.

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Hypertension Causes, from Lifestyle to Genetics

Dietary Intake Factors	Non-Dietary Factors
• Higher sodium intake • Lower potassium intake • Lower calcium/ magnesium intake • Lower diet quality *(lower intake of fruits/ vegetables, plant proteins, fiber)* • Alcohol intake	• Genetics variants • Overweight/obesity • Lower physical activity/fitness • Sleep disturbances *(related to duration, quality, regularity and/or disordered breathing)* • Psychosocial stressors • Air pollution

Jones, D.W., et al. (2025). 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. *Circulation*.

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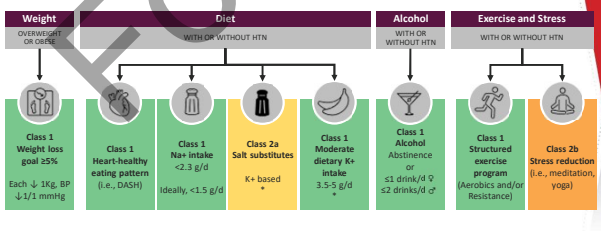
Blood pressure management: Lifestyle and psychosocial approaches



*Monitor potassium in those at risk for hyperkalemia

Abbreviations: BP indicates blood pressure; DASH, Dietary Approaches to Stop Hypertension diet Kg, kilograms; and HTN, hypertension.

Jones, D.W., et al. (2025). 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. *Circulation*.

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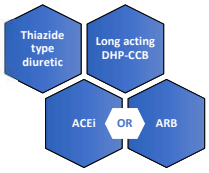
Initial Medication Selection for Treatment of Primary HTN

COR	RECOMMENDATIONS
1	For adults initiating antihypertensive drug therapy, thiazide-type diuretics, long-acting dihydropyridine CCBs, and ACEi or ARBs are recommended as first-line therapy to prevent CVD.



Abbreviations: ACEi indicates Angiotensin Converting Enzyme inhibitors; ARB, Angiotensin Receptor Blocker; CVD, cardiovascular disease; and LA DHP-CCB, Dihydropyridine Calcium Channel Blocker.

Jones, D.W., et al. (2025). 2025 AHA/ACC/ANNP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. Circulation.

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Hypertension and Pregnancy

Individuals with hypertension who are planning a pregnancy or become pregnant

- Labetalol and extended-release nifedipine are preferred to minimize fetal risk and treat hypertension — Class 1
- Should be counseled about the benefits of low-dose (81mg/day) aspirin to reduce the risk of preeclampsia and its sequelae — Class 1
- Should *not* be treated with atenolol, ACEI, ARBs, direct renin inhibitors, nitroprusside, or MRAs to avoid fetal harm — Class 3: Harm

Pregnant individuals

- With SBP ≥160 mmHg or DBP ≥ 110 mm Hg confirmed on repeat measurement within 15 minutes, lower BP to <160/<110 mm Hg within 30-60 minutes to prevent adverse events — Class 1
- With Chronic hypertension, treat to achieve BP <140/90 mm Hg to prevent maternal and perinatal morbidity and mortality — Class 1

Abbreviations: ACEi indicates Angiotensin Converting Enzyme inhibitors; ARB, Angiotensin Receptor Blocker; BP, blood pressure; DBP, diastolic blood pressure; HTN, hypertension; MRA, mineralocorticoid receptor antagonist; SBP, systolic blood pressure; and TX, treatment.

Jones, D.W., et al. (2025). 2025 AHA/ACC/ANNP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. Circulation.

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Life's Essential 8 (LE8): Holistic Prevention Framework for Women Across the Life Span.

Lloyd-Jones DM, et al. Circulation. 2022;146:e18–e43. https://doi.org/10.1161/CIR.0000000000001078

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LE8– Protecting Heart Health in Midlife Women

Healthy Diet	Physical Activity	No Nicotine	Sleep Health
Only ~40% meet AHA diet score in midlife	≥150 min/week reduces BP & glucose	8% of midlife women still smoke	Poor sleep ↑ HTN & obesity during menopause

Healthy Weight	Blood Pressure	Blood Lipids	Blood Glucose
Central adiposity ↑ post-menopause	HTN prevalence ~50% postmenopause	LDL rises, HDL drops after menopause	20–30% ↑ T2DM risk after menopause

↑ 17–40% CVD risk reduction per 10-point increase in LE8 score.

Lloyd-Jones DM, et al. Circulation. 2022;146:e18–e43. doi:10.1161/CIR.0000000000001078
Zhu D, et al. J Am Heart Assoc. 2023;12:e028355. doi:10.1161/JAHA.122.028355
El Khoudary SR, et al. Circulation. 2020;142:2403–2425. doi:10.1161/CIR.0000000000000912

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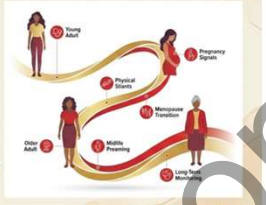
Life-Course Prevention and Recovery in Women

A Holistic Approach to Women's Cardiovascular Health

Targets:

- **BP**: goal <130/80 mmHg (optimal <120/80 mmHg)
- **Lipids**: LDL reduction per risk; check lipoprotein(a); optimal GDMT
- **Metabolic**: optimize glycemic control and weight management
- **Lifestyle**: DASH/Mediterranean diets; Physical activity, restorative sleep, stress management
- **Postpartum & perimenopause**: home BP monitoring; early follow-up & counseling
- **Recovery**: equitable rehab access, treat depression, caregiver support



AHA Scientific Statement 2022; Circulation Statistics 2024.
AHA/ACC High Blood Pressure Guidelines. *Hypertension*. Volume 82, Number 10.

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Life's Essential 8 (LE8): Holistic Prevention Framework for Women Across the Life Span.

Perimenopause/Menopause "Sandwich" Generation

- Psychological Interventions
- Caregiver Support
- Allostatic Load Screening
- Self-Care Promotion

Optimization through AHA's Life's Essential 8™ (Focusing on Health Factors & Behaviors First)

AHA's Life's Essential 8

Transition to Later Life

Ensuring Health Optimized First

Ensuring Health Optimized First for Reduced Cardiovascular Risk & Improved Quality of Life in Later Years

Lloyd-Jones DM, et al. Circulation. 2022;146:e18–e43. https://doi.org/10.1161/CIR.0000000000001078

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A Changing Paradigm in Risk Assessment

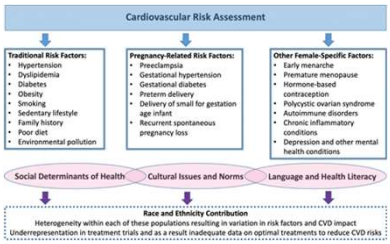

Figure 1. Cardiovascular risk factors in women and the impact of race and ethnicity contribution.

Mehta LS, Velarde GP, Lewey J, Sharma G, Bond RM, et al. Circulation. 2023 May 9;147(19):1471-1487.

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Summary & Take Home Message

- Cardiovascular disease remains the leading cause of death in women, yet much of this burden is preventable.
- Women's cardiovascular risk evolves across the life course, influenced by conventional risk factors, female-specific conditions, and female-predominant disorders.
- Pregnancy acts as an early physiologic stress test and powerful signal of future cardiovascular risk often decades before traditional risk factors.
- The perimenopause and menopause transition represents another critical inflection point, marked by rising cardiometabolic risk and accelerated increases in blood pressure.
- Hypertension remains the single greatest modifiable risk factor for CVD in women, underscoring the importance of early detection, aggressive management, and longitudinal monitoring.
- Younger women—particularly Non-Hispanic Black women—experience a disproportionate burden of cardiovascular morbidity and mortality, highlighting the importance of addressing structural inequities and social drivers of health.
- Obtaining a comprehensive reproductive and obstetric history, along with cardiometabolic screening, should be a routine component of cardiovascular risk assessment.
- A life-course, prevention-focused approach—integrating pregnancy signals, menopause transitions, and personalized care—can transform how we prevent and treat cardiovascular disease in women.

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Thank you!
Questions?

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