



Reframing Midlife: A Critical Window for Advancing Women's Health Across the Life Course

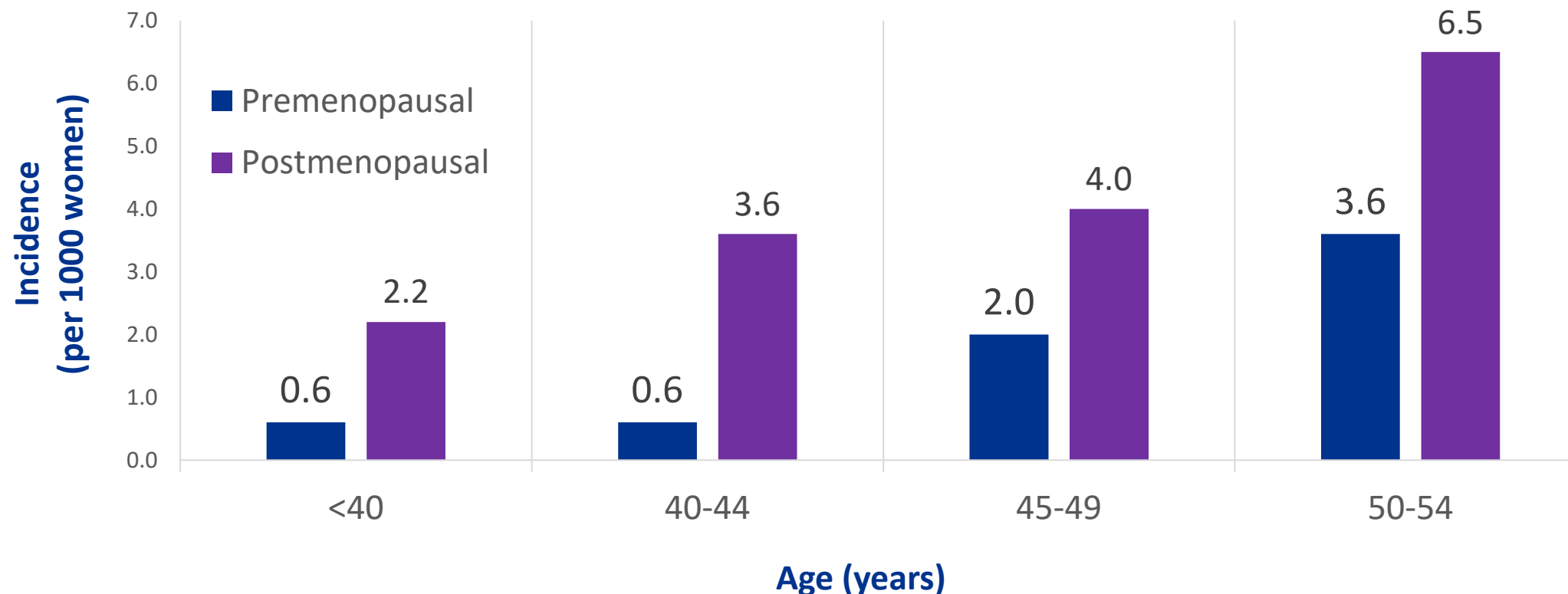
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National Institutes of Health

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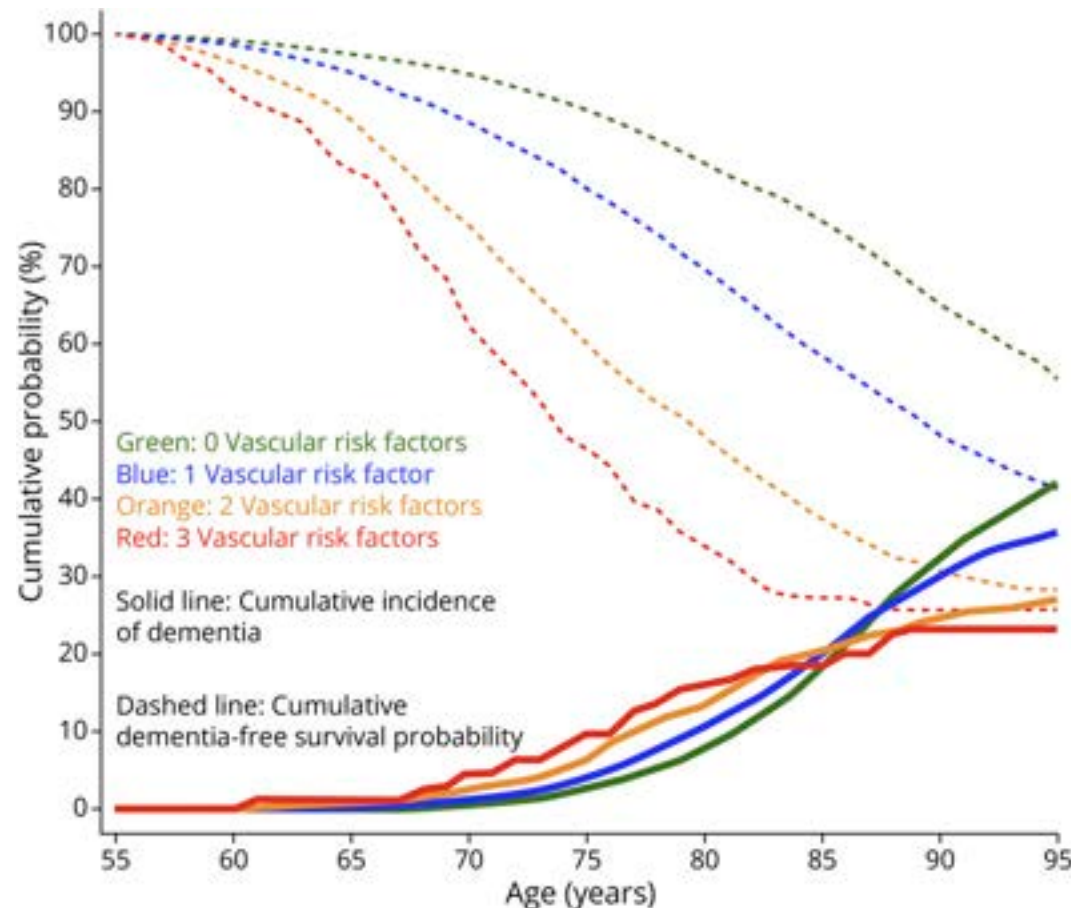
Incidence of Cardiovascular Disease in Women Increases With Age and After Menopause



Address the key role menopause plays in the health of midlife women as a critical aspect of preventing, diagnosing, and treating chronic conditions

Window of Opportunity: Fewer Number of Midlife Vascular Risk Factors Associated with Decreased Dementia Risk

Dementia-Free Survival Years by Vascular Risk Burden and Sex



Actionable insight: Manage or prevent vascular diabetes, hypertension, smoking (vascular risk factors) as a potent, modifiable strategy to extend cognitive health in women and men

Magnitude of prevention: No vascular risk factors offers ~13 additional dementia-free years for women (and ~ 12 years for men) compared to three risk factors

Healthspan vs lifespan: Reframe the midlife conversation to living longer without dementia, not just living longer to improve quality of life AND autonomy

Meaningful sex differences: Across risk factor levels, women live substantially longer dementia-free than men

Participants from 4 U.S. communities: Forsyth County, North Carolina; Jackson, Mississippi; Minneapolis Suburbs, Minnesota; and Washington County, Maryland

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Dementia-Free Survival Years by Vascular Risk Burden and Sex

Dementia-Free Survival Years (Age 55-95)



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Window of Opportunity

40 – 65 Years Old

+Awareness
Adopt health behaviors
Design early preventive practices

Changes in Symptoms and Mental Health

↑ Depression and Anxiety	Transient
↑ Urinary Incontinence	
↓ Cognitive Performance (After Menopause)	
↑ Vasomotor Symptoms (Hot Flashes and Night Sweats)	Transient
↑ Sleep Complaints	
↑ Cognitive Difficulties	Transient
↑ Vaginal Dryness	
↑ Sexual Pain ↓ Sexual Desire	

Changes in Physiological Systems and Functions

↓ Physical Function Performance	Transient
↑ Lipids ↑ Vascular Remodeling ↑ Metabolic Syndrome	
↑ Body Mass Index ↑ Blood Pressure	
↓ Bone Mineral Density	
↓ Lean Mass ↑ Fat Mass	

Midlife Aging

The Menopause Transition

Contribution of the Menopause Transition and Midlife Aging to Women's Health and Well-being

- Menopause and aging are not interchangeable, they are intertwined
- Menopause has multisystem effects beyond hot flashes
- Midlife creates an actionable window for prevention

The Menopause Transition should trigger a broad assessment of a woman's health, not solely focus on management of hot flashes.

Aging and Menopause Accelerate Chronic Conditions

Chronic conditions common in midlife

MOST COMMON HEALTH CONDITIONS IN WOMEN AGES 40 TO 59

(Prevalence in midlife)

	48%	Musculoskeletal pain
	27%	Benign neoplasms
	27%	Anxiety disorders
	25%	Depressive disorders
	24%	Disorders of lipid metabolism

Chronic health issues emerge during menopause

8 CONDITIONS THAT INCREASED $\geq 45\%$ FROM AGES 40 TO 59

Prevalence increased by 45% or more across midlife

	Disorders of Lipid metabolism		Esophageal disorders
	Hypertension		Osteoarthritis
	Sleep/wake disorders		Tendon and synovial disorders
	Thyroid disorders		Menopausal disorders

**Ages
40–59**

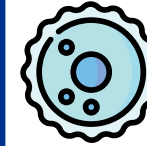


Midlife provides an important window to identify emerging chronic conditions, investigate shared biological pathways, and intervene early.

The NASEM's Conceptual Framework for Research on Chronic Conditions in Women



Female-specific and Gynecologic Conditions that Lead to Significant Morbidity
Pregnancy and Menopause



Chronic Conditions that Predominantly Impact Women
Autoimmune Disease



Chronic Conditions that Impact Women Differently
Cardiovascular Disease



Accumulation of Multiple Chronic Conditions

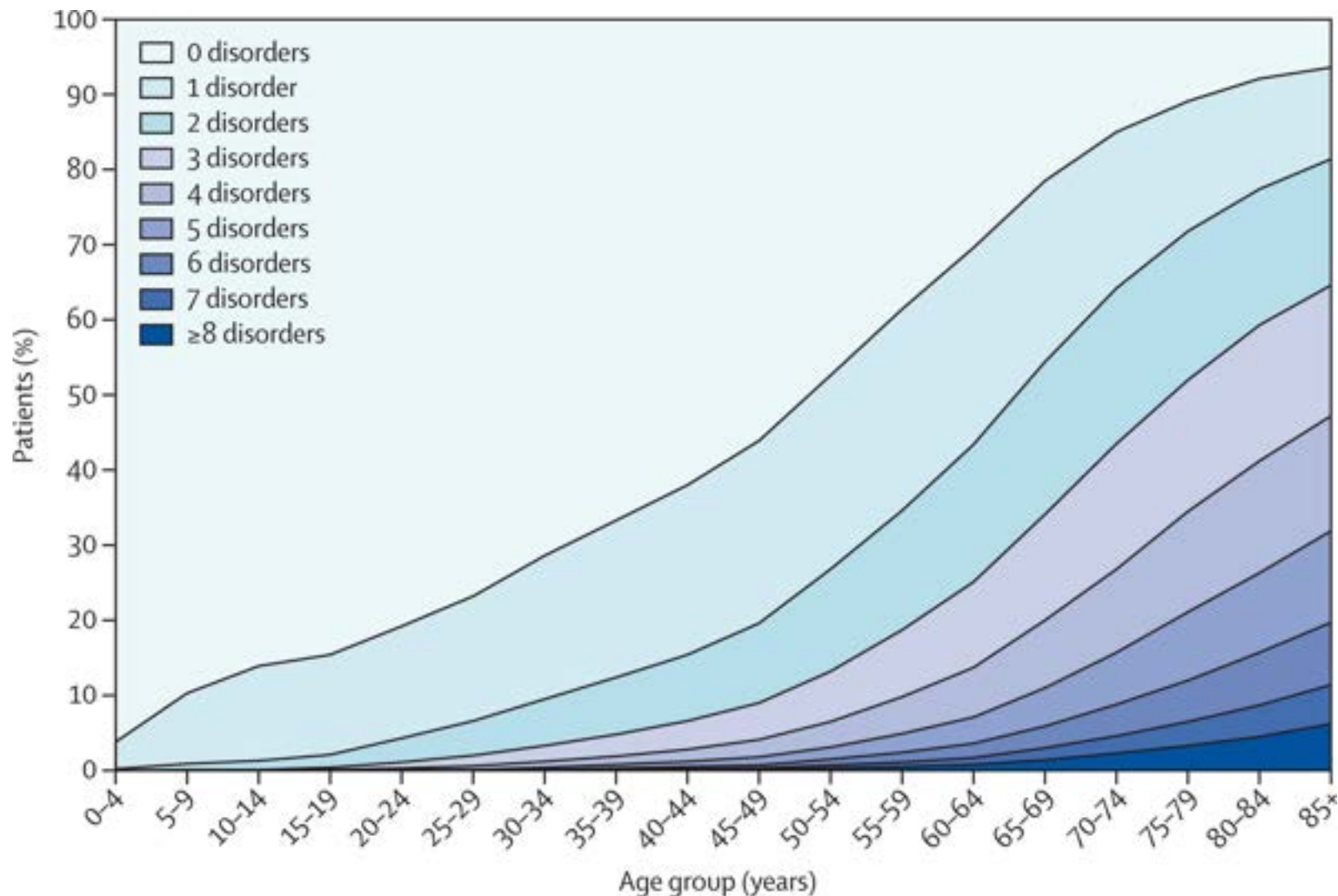
“We want to create a future anchored in enhanced knowledge and strategies...[for women] to carry out the vital functions of daily living and experience life to its fullest.”

Eve J. Higginbotham, M.D., S.M.

Chair

Committee on Framework for the Consideration of Chronic Debilitating Conditions in Women

Perimenopause: The Critical Inflection Point in the Development of Multimorbidity



Life Course Accumulation:

Multimorbidity increases with age

Absolute number with multimorbidity:

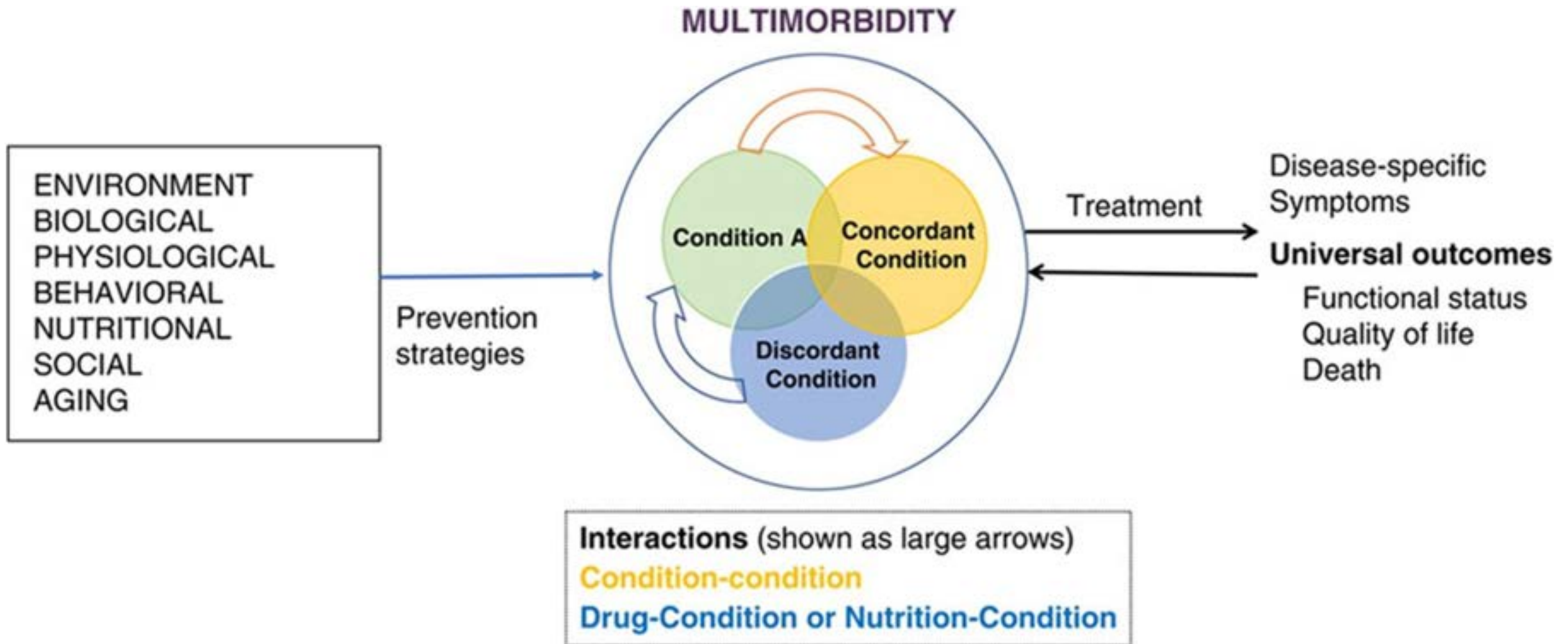
Greatest under age 65

Midlife Inflection Point: Ages 45–55

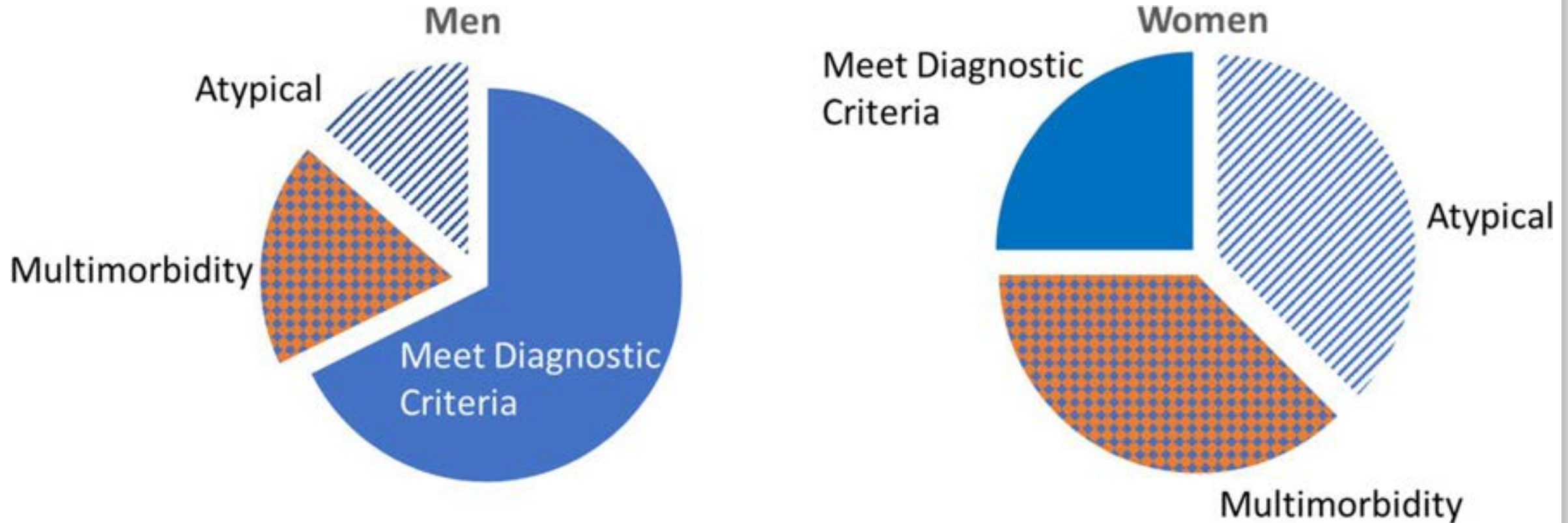
Complex Health Needs: Developing > one chronic disease requires personalized care

Population differences: Earlier and more common in under-resourced communities

Understanding Midlife Multimorbidity: Moving Beyond a Single-Disease Framework

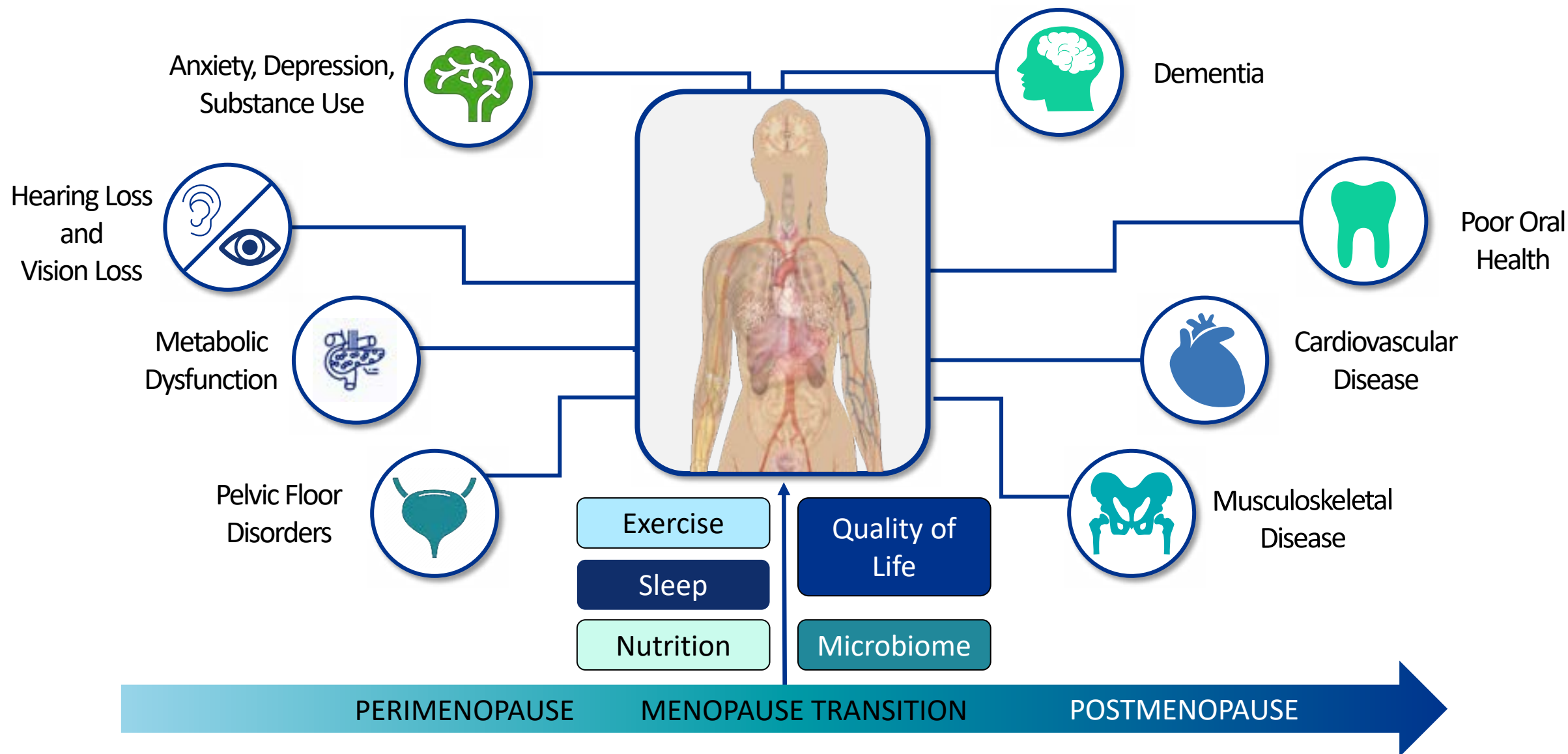


Women's Health Research Must Address Multimorbidity and Atypical Presentation of Conditions



Research and Clinical Opportunity: Sex-Informed Diagnostics

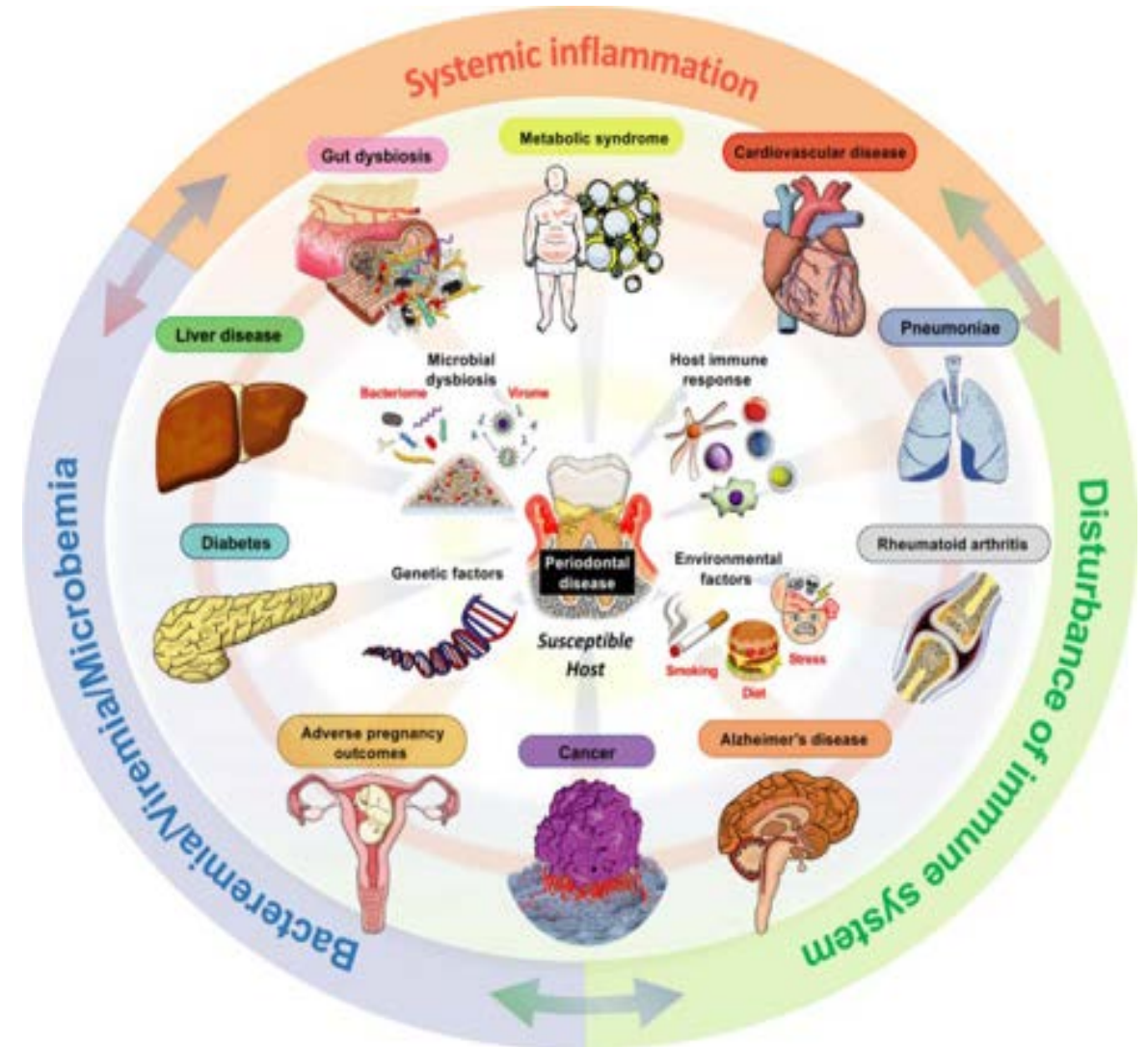
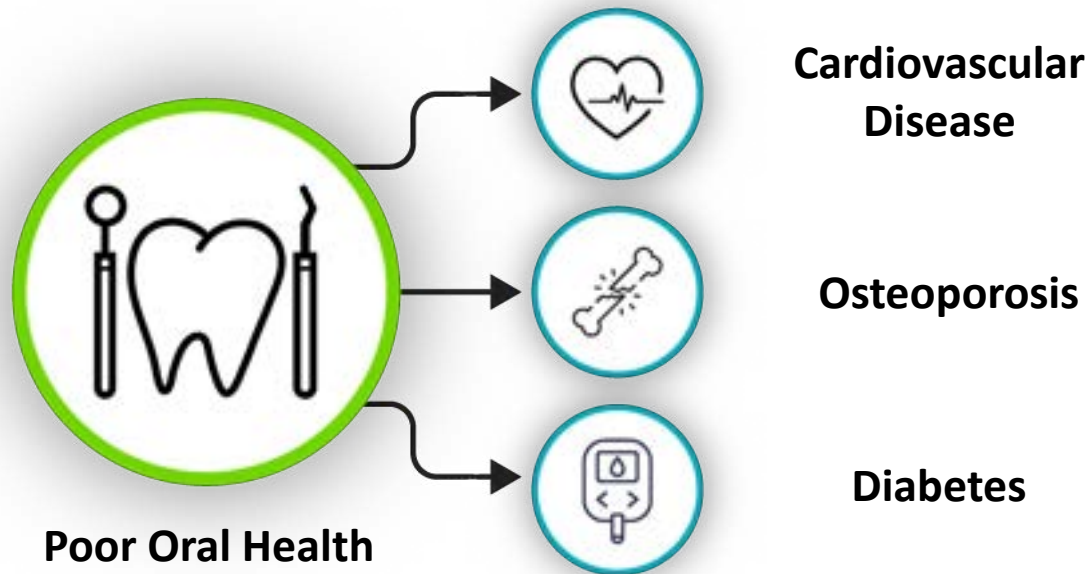
Multidimensional Approach to the Midlife Health of Women



The Critical Link Between Poor Oral Health and Chronic Systemic Diseases

Investigation

Self-reported oral health is associated with systemic health outcomes and all-cause mortality



Driving Innovation in Menopause Research, Education, and Care

April 15–17, 2026

Pathways to Prevention (P2P) Workshop: Advancing Research to Improve Health During the Menopausal Transition

- Convene federal agencies, researchers, clinicians, and community members to assess current evidence and identify **critical research gaps** in management of the menopausal transition
- **Key Precipitating Themes across NIH:**
 - **What are the most effective treatments** for menopausal symptoms?
 - **How do treatment effects vary** by timing, formulation, and population?
 - **How are benefits and risks balanced** across outcomes and development of chronic disease?
 - **How can care be improved** for women with different needs and contexts?

Videocast -
<https://go.nih.gov/qxgf3au>

LAUNCHED

COMpetency in Menopause & Integrated Therapy (COMMIT) Challenge

- Identify, amplify, and reward **evidence-based curricula** addressing the menopausal transition and hormone therapy in U.S. health education programs
- **Focus Areas:** Menopausal transition & symptom management, Hormone & non-hormone therapies, Interdisciplinary/team-based care, Competency demonstration & scalability
- The challenge recognizes programs with evidence-based, scalable curricula **already in use** and demonstrating measurable competency gains
- Anticipated start of application acceptance - **Fall 2026**; Submission close - **January 2027**

For more information:
<https://go.nih.gov/tRAKITy>

Computational Modeling of Hormone Homeostasis Program Launch

September 14, 2026

*Enabling sex-specific therapeutic efficacy and toxicity evaluation and
transforming women's health outcomes*



The Virginia Polytechnic Institute team will develop a physics-informed computational model that simulates how vaginal tissue grows, remodels, and responds to mechanical stress across the lifespan.



The Michigan State University team will develop an *in silico* platform of female reproductive endocrinology to predict metabolic therapeutic response across the female reproductive lifespan.



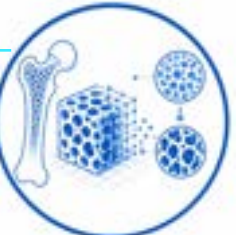
The University of Virginia team will model how the microbiome influences estrogen metabolism and how estrogen is processed and recycled by the body in a connected system linking gut, liver, and vaginal physiology. **Co-funded by the Office of Research Innovation, Validation and Application (ORIVA)*



The Montana State University team will develop a computational model of articular chondrocytes to understand how differences in male and female metabolism produce specific proteins and unintended off target drug effects.



The Morgan State University team will develop a digital twin of the hypothalamus, placenta, and gastrointestinal tract for pregnant women.



The University of California, San Francisco team will model how hormone homeostasis in both males and females influences skeletal responses to osteoporosis therapies and endocrine treatments.



THANK YOU!



National Institutes of Health
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