

Aging in Women Living with HIV

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Disclosures

None

Learning Objectives

1

To describe the impact of aging on the health of women living with HIV

2

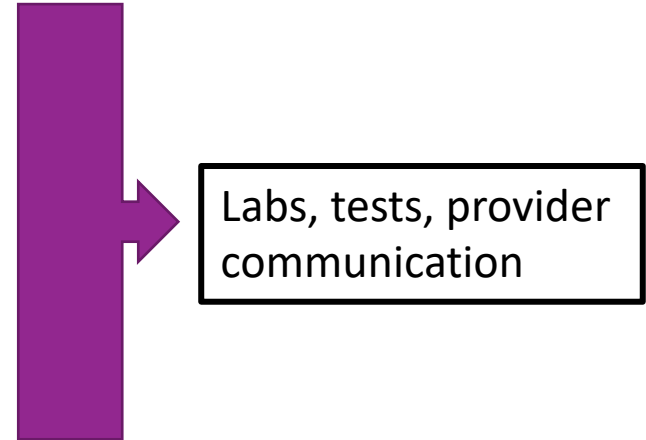
To understand factors associated with frailty and healthy aging in women living with HIV

3

To discuss medical test results and advocate for your own health with your provider

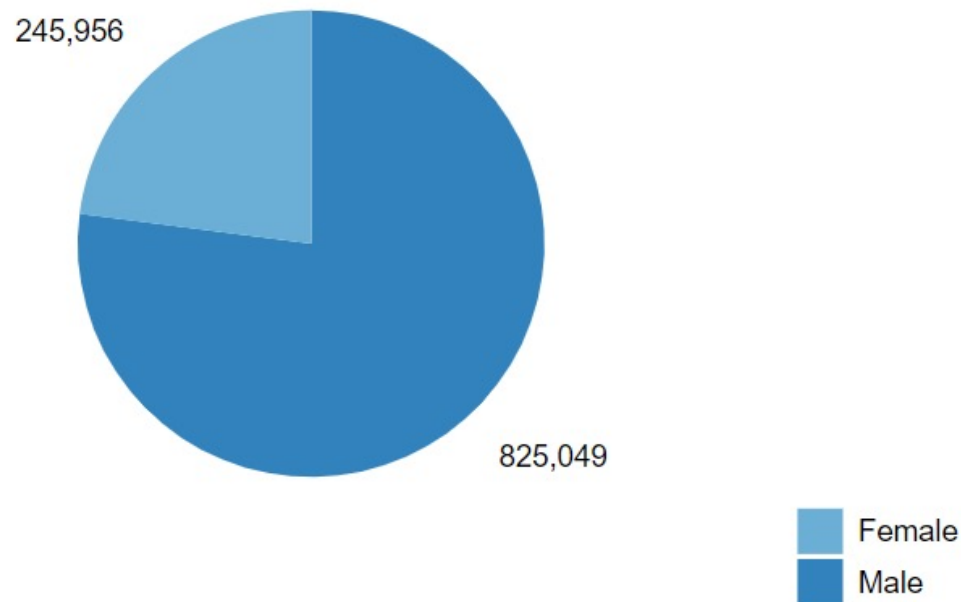
Outline

1. Background/introduction: why do we care about HIV in women?
2. Aging with HIV
 - a. Menopause
 - b. Comorbidities
 - c. Age-appropriate cancer screenings
 - d. Frailty
3. What to discuss with your healthcare provider



Women account for 23% of all PLWH in the US and over 50% of all PLWH worldwide

HIV prevalence | 2021 | Ages 13 years and older | All races/ethnicities | Both sexes | All transmission categories | United States



Centers for Disease Control and Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention



Summary of the global HIV epidemic, 2021

	People living with HIV in 2021	People acquiring HIV in 2021	People dying from HIV-related causes in 2021
Total	38.4 million [33.9–43.8 million]	1.5 million [1.1–2.0 million]	650 000 [510 000–860 000]
Adults (15+ years)	36.7 million [32.3–41.9 million]	1.3 million [990 000–1.8 million]	560 000 [430 000–740 000]
Women (15+ years)	19.7 million [17.6–22.4 million]	640 000 [480 000–870 000]	240 000 [180 000–320 000]
Men (15+ years)	16.9 million [14.6–19.7 million]	680 000 [500 000–920 000]	320 000 [250 000–430 000]
Children (<15 years)	1.7 million [1.3–2.1 million]	160 000 [110 000–230 000]	98 000 [67 000–140 000]

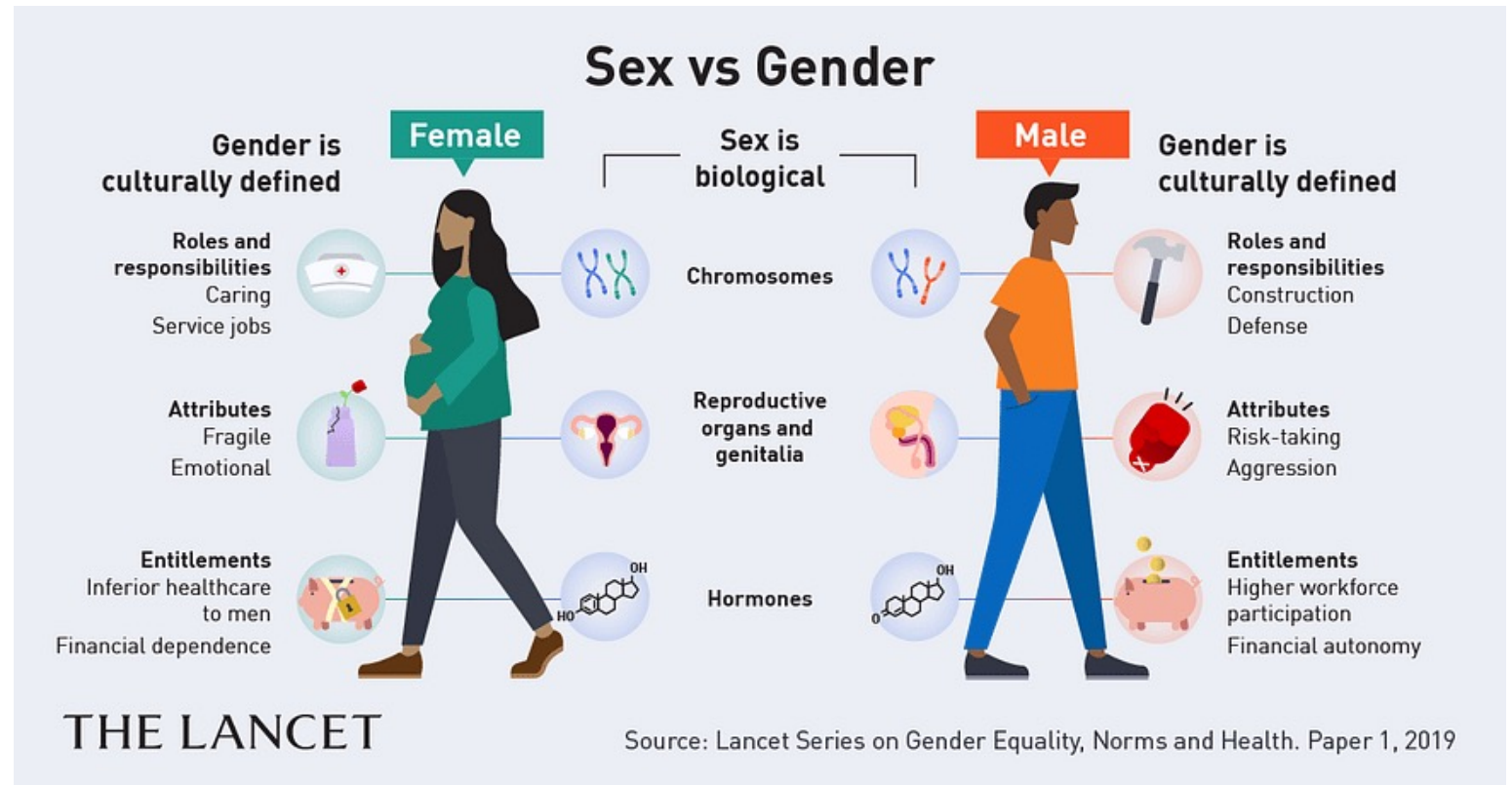
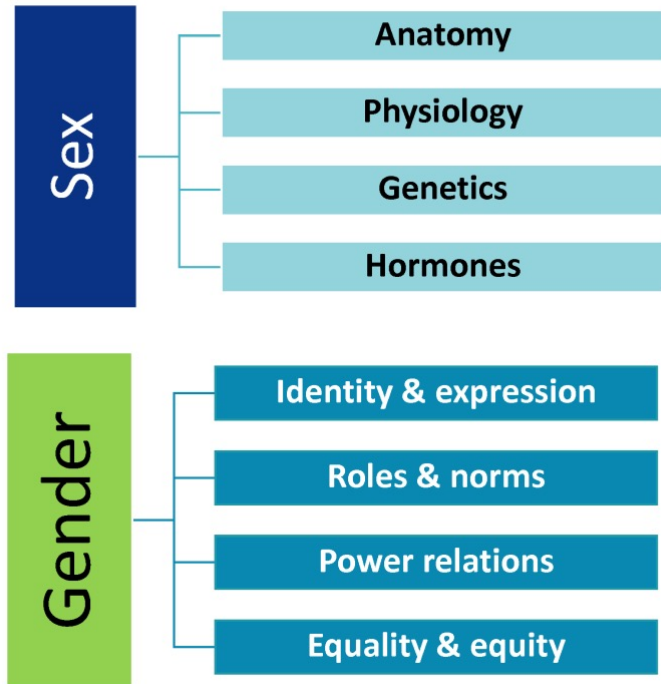
Source: UNAIDS/WHO estimates

Updated: July 2022



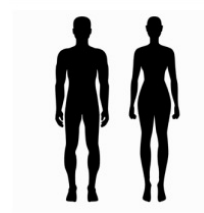
Impact of Sex and Gender on HIV in Women

Domains of Sex and Gender



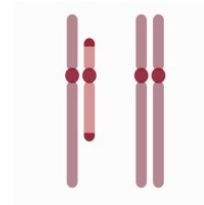
Impact of Sex on HIV in Women

- HIV acquisition
- Lower viral load set point
- Lower CD4 counts at similar viral loads
- Immune activation and inflammation
- Responses to antiretroviral therapy (ART) and side effects
- Comorbidities
- Impact of menopause



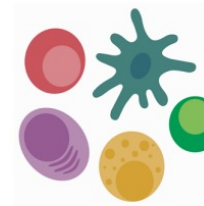
Anatomic Differences:

- Acquisition sites: female genital tract versus rectal mucosa
- Hormonal modulation of risk at the female genital tract
- Drug penetration to mucosal sites



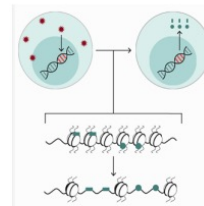
Genetic differences:

- Gene dosage effects of X chromosome encoded genes/incomplete X inactivation
- Regulatory function of X-encoded microRNAs
- Estrogen responsive elements in promoters of multiple immune active genes



Immune cell phenotypes:

- Higher interferon alpha production from plasmacytoid dendritic cells from women
- Sex differences in the efficacy of vaccines
- Hormone modulation of immune cell function



Latency maintenance:

- Estrogen blockade of HIV transcriptional activation
- Sex specific epigenetic modifications in immune cells



Microbiome:

- Female genital tract and rectal mucosa with distinct microbiome compositions that determine local inflammation and acquisition risk
- Direct effects of the vaginal microbiome on local antiretroviral drug levels
- Sex hormone modulation of the gut microbiota that contributes to systemic inflammation

Impact of Sex and Gender on HIV in Women

HIV acquisition

Delayed HIV diagnosis/Illness at diagnosis

Access to healthcare and antiretroviral therapy (ART)

ART side effects and adherence

Healthcare utilization

Inclusion of women in biomedical research



Aging in Women with HIV

Menopause

Comorbidities

Cancer screenings

Frailty

Promoting Healthy Aging in Women with HIV

“Being able to do the things we value for as long as possible”

AGEING and HEALTH  World Health Organization

▶ EVERY OLDER PERSON IS DIFFERENT



Some have the level of functioning of a 30 year old.

Some require full time assistance for basic everyday tasks.

Health is crucial to how we experience older age.

▶ WHAT INFLUENCES HEALTH IN OLDER AGE

INDIVIDUAL **ENVIRONMENT THEY LIVE IN**



Age-related changes

Genetics

Disease

Behaviours

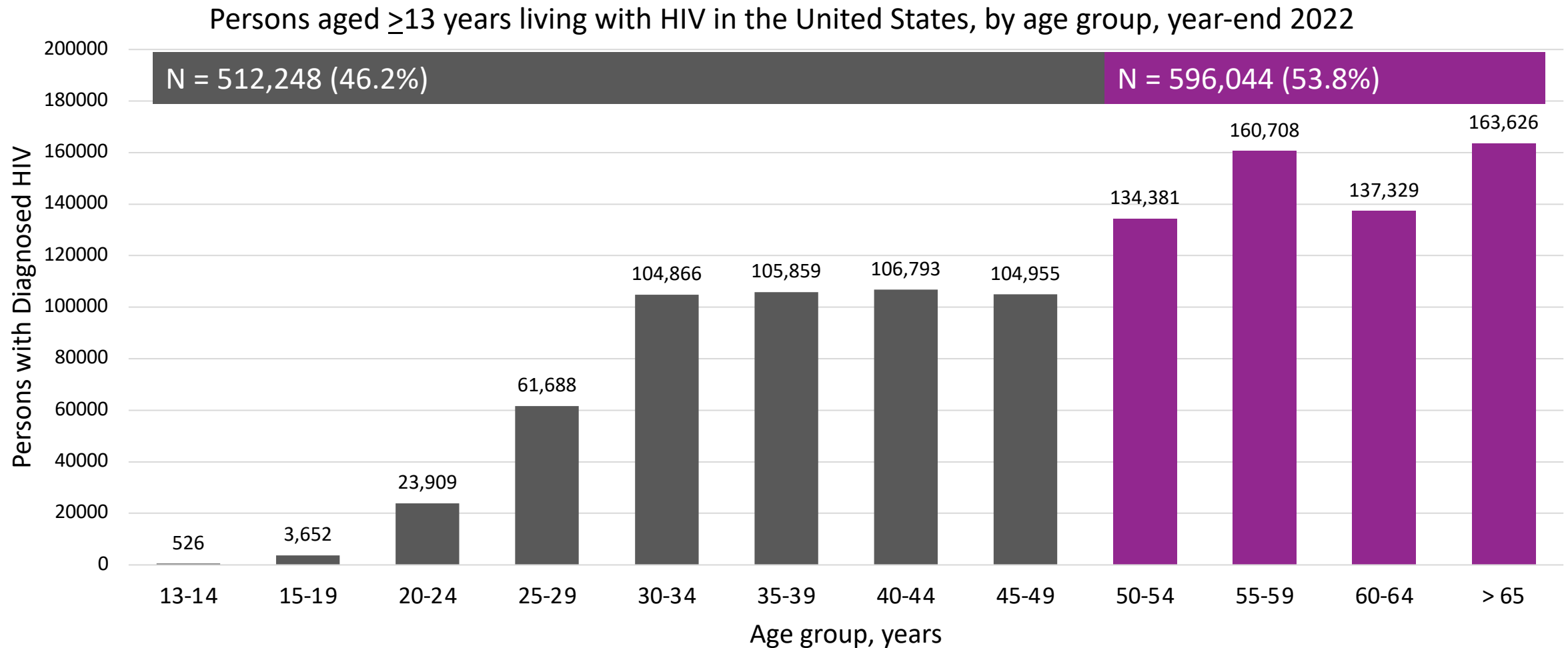
Housing

Assistive technologies

Social facilities

Transport


Over 50% of People with HIV in the U.S. are over Age 50



Source: Centers for Disease Control and Prevention. *HIV Surveillance Report*, 2022; <https://stacks.cdc.gov/view/cdc/156509> May 2024. Accessed October 2024.

**BY 2030, UP TO
70% OF PEOPLE
WITH HIV WILL BE
OVER THE AGE OF 50.**





“To suggest that in order to age successfully, one must age in the absence of disease is unrealistic if not ageist, ignoring the diversity that exists in the health of older adults.”

Emlet CA et al. *Ageing and Society*. 2017;37(10):2128-2151

Menopause

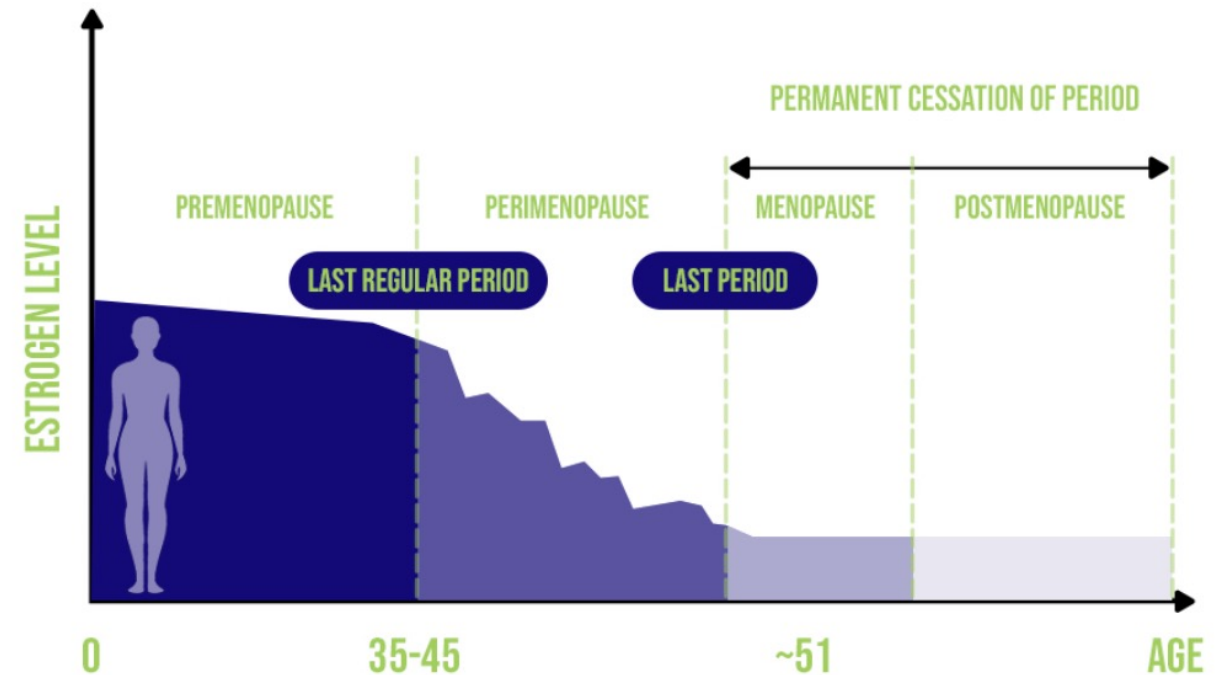
Symptoms

Treatment

Menopause

- 12 months after the final menstrual period
- Average age: 45-55 (possibly younger in women with HIV)
- Ovaries stop producing estrogen
- Results in important health changes
 - Weight gain
 - Cardiovascular risk
 - Bone loss
- Most women with menopausal symptoms do not receive effective, approved, evidence-based therapy

STAGES OF THE MENOPAUSE TRANSITION



Menopause in women with HIV

Biopsychosocial impact

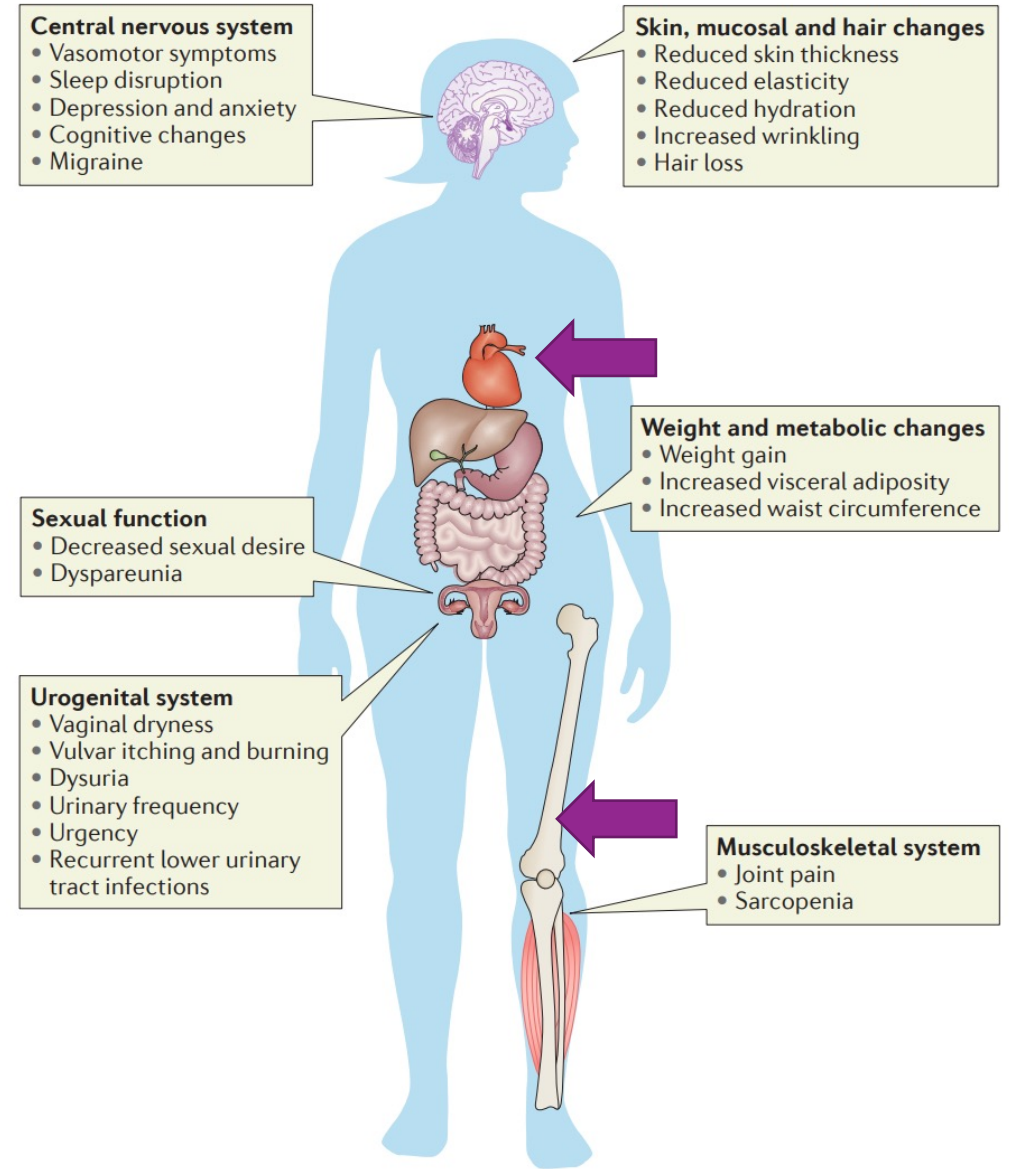
- Comorbidity risk
 - Heart disease
 - Osteoporosis (bone disease)
- Psychological impact
 - Anxiety/depression
 - Irritability
 - Difficulty concentrating

Menopause timing

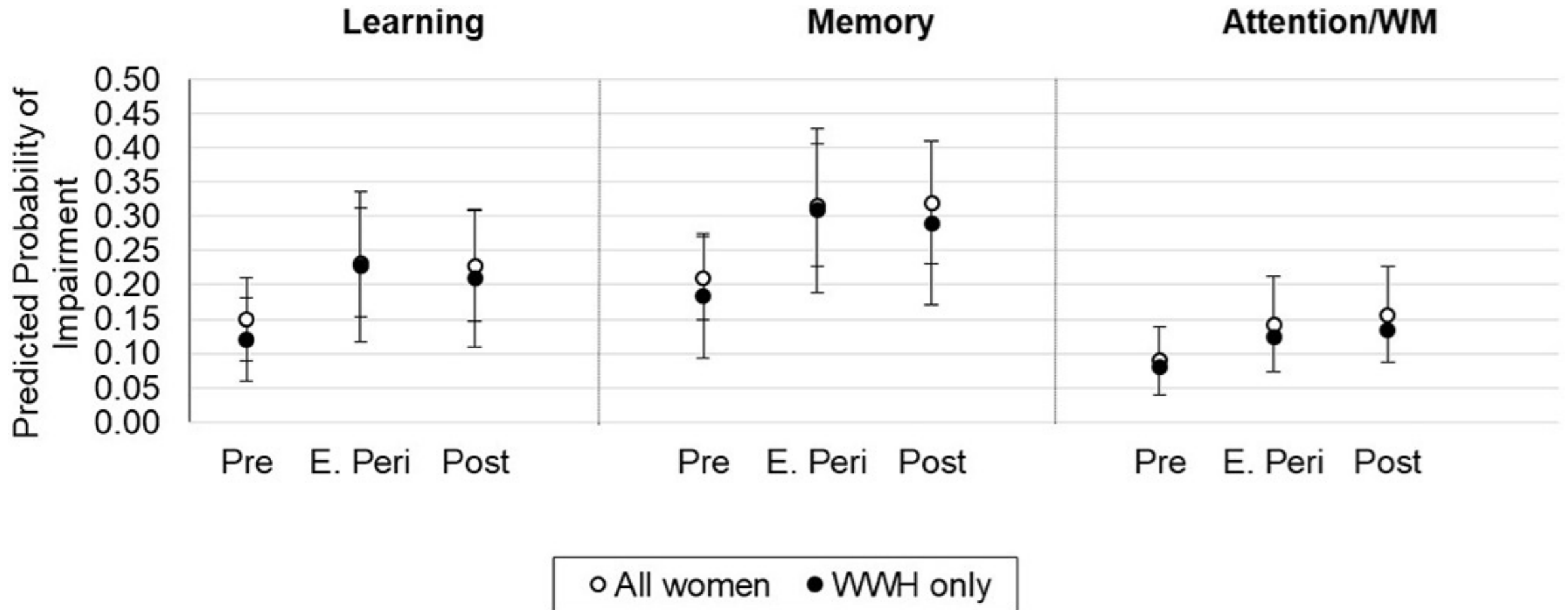
- Smoking
- Detectable HIV viral load
- Hepatitis C virus coinfection

Symptom burden and severity

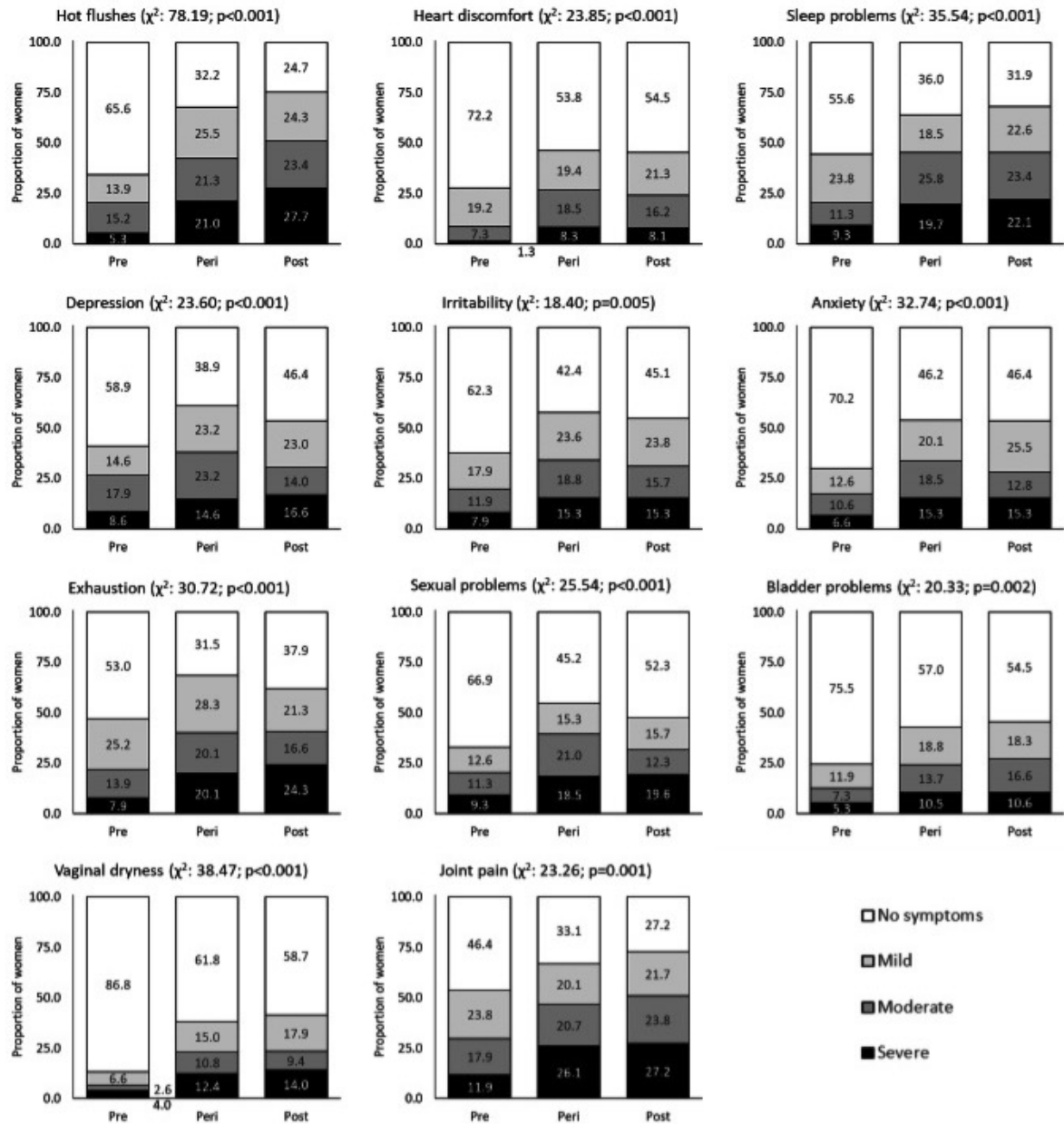
- Hot flashes
- Fatigue
- Muscle aches/joint pains
- Insomnia
- Sexual health and well-being



Menopause is associated with declines in cognitive function in women with and without HIV

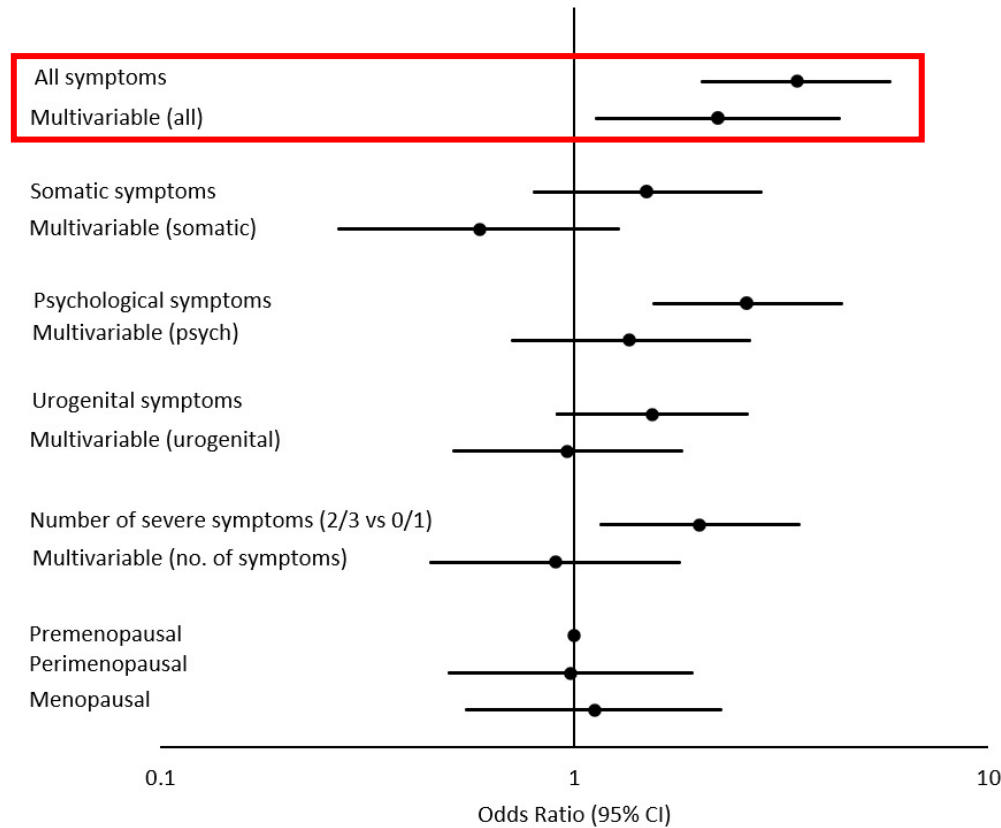


Menopause symptoms are common in women with HIV

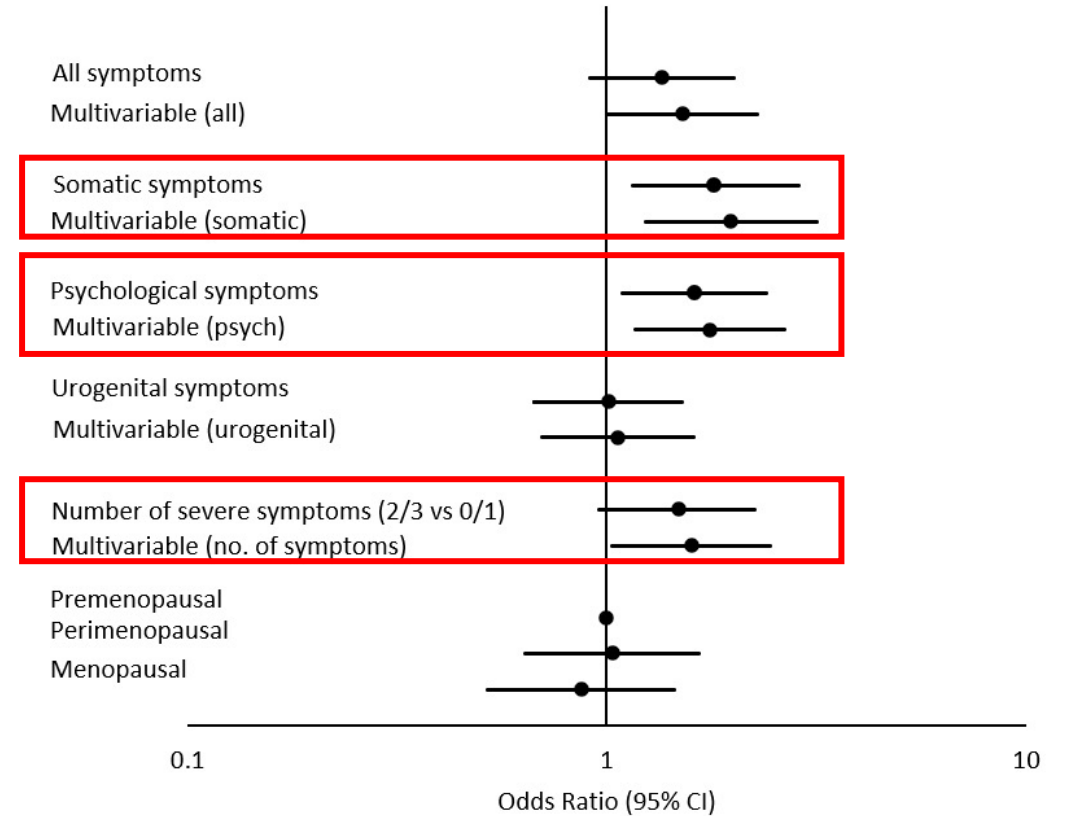


Severe menopause symptoms are associated with reduced quality of life, poorer mental health, and poorer engagement in HIV care

Univariable and multivariable logistic regression analyses of the association between menopausal symptoms (severe vs. none/mild/moderate) and suboptimal ART adherence



Univariable and multivariable logistic regression analyses of the association between menopausal symptoms (severe vs. none/mild/moderate) and suboptimal HIV clinic attendance



Solomon D et al. *AIDS Care*. 2021;33(1):101-108

Haag K et al. *Menopause*. 2022;29(4):421-429

Okhai H et al. *Women's Health (Lond)*. 2022;18:174550652111068722.

Treatment options for menopause symptoms



Systemic menopause hormone therapy

- Estrogen (no uterus)
- Estrogen + progestin (uterus)



Topical hormone therapy

- Low-dose vaginal estrogen
 - For vaginal dryness
 - Prevents recurrent UTIs



Non-hormonal medication

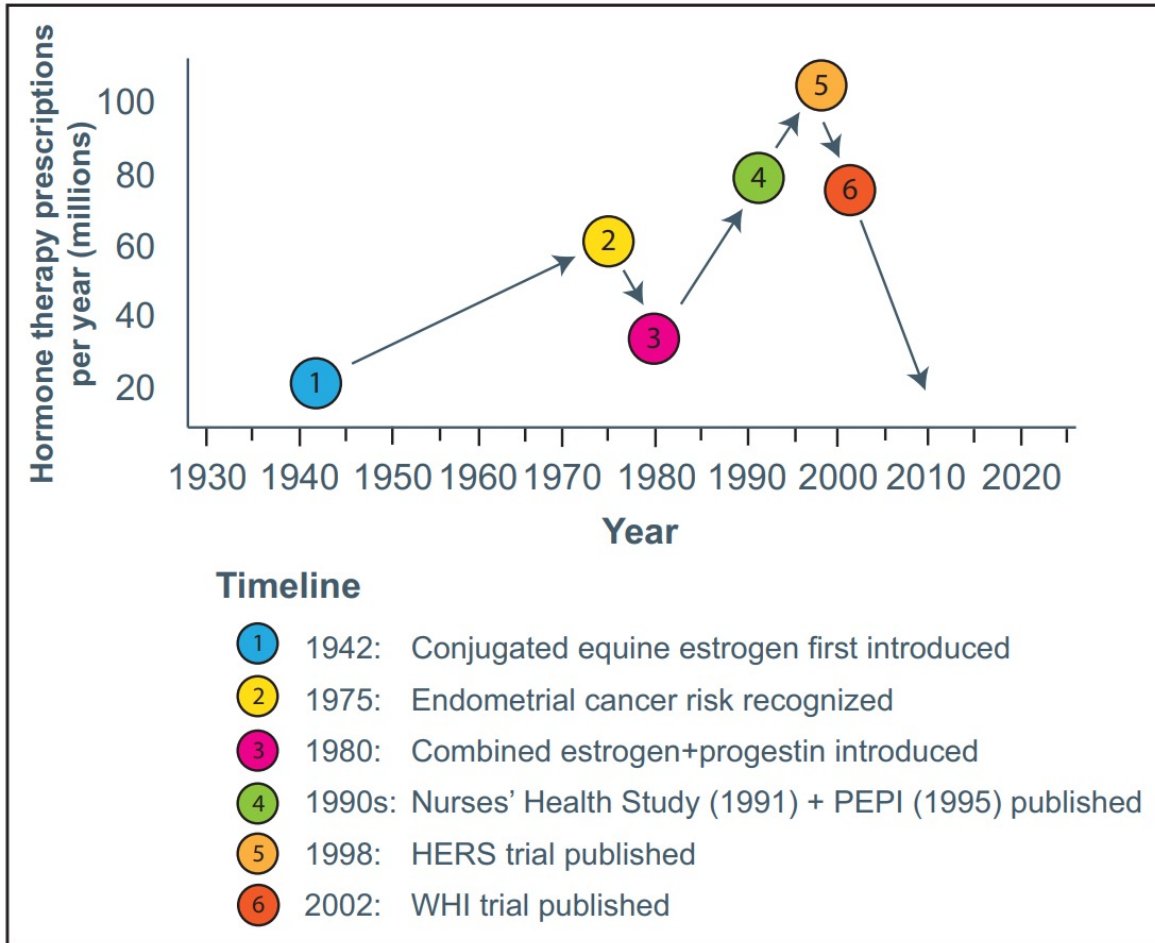
- Sleep aids
- Antidepressants (citalopram, venlafaxine, paroxetine)
- Gabapentin
- Clonidine
- Oxybutynin
- Neurokinin B receptor antagonists



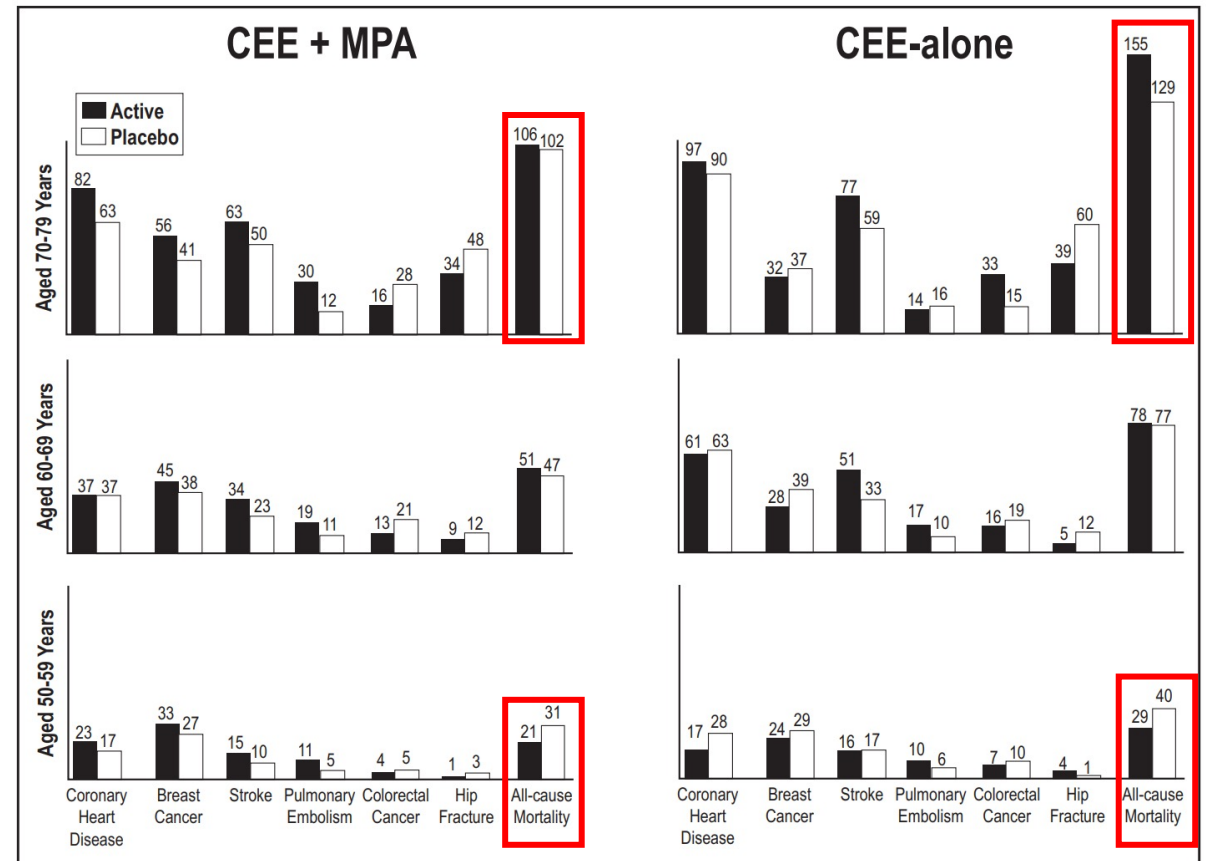
Non-pharmacologic treatments

- Cognitive behavioral therapy
- Hypnotherapy
- Acupuncture

A brief history of menopausal hormone therapy

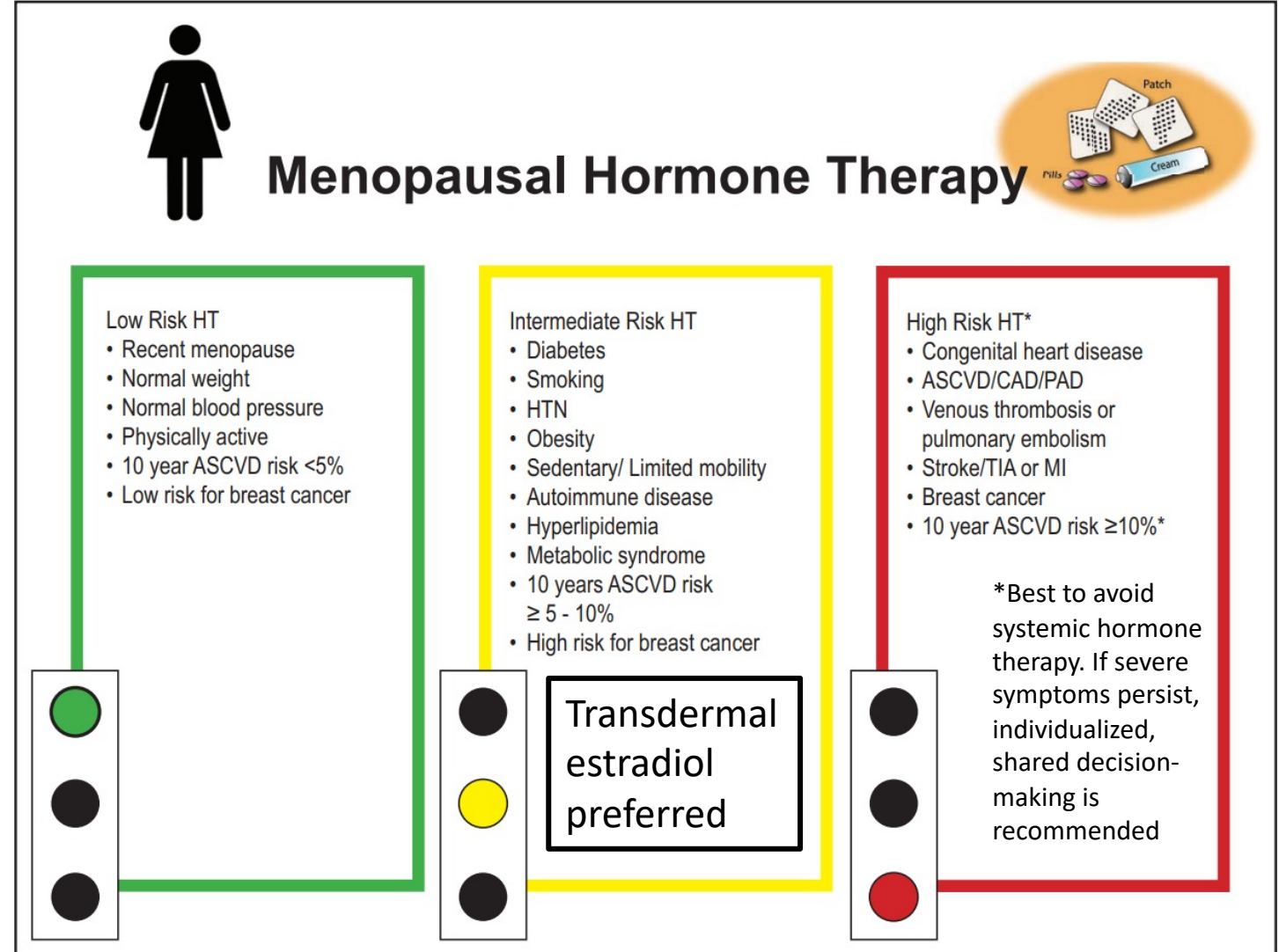


The Timing Hypothesis



Recommendations for menopausal hormone therapy

- Age <60, within 10 years of last menstrual period
- For vasomotor symptoms
- Lowest dose for the shortest time
- Indicated for premature and early menopause
- Almost all women are candidates for low-dose vaginal estrogen therapy for genitourinary symptoms of menopause



Menopausal hormone therapy is underutilized in women with HIV

Use of MHT

- Vancouver study: 12% offered, 5.5% uptake¹
- WHS study: 23% reported ever use, 8% reported current use²
- Swiss HIV Cohort Study: 11% use³

Reasons for underuse

- Provider knowledge/comfort
- Concern for drug-drug interactions with ART
- Pill burden
- Concerns about side effects

¹Duff PK et al. *Menopause*. 2018;25(5):531-537

²Peters BA et al. *Clin Infect Dis*. 2023;76(3):e661-e670

³Hachfeld A et al. *HIV Med*. 2022;23(4):417-425

King EM et al. *Lancet HIV*. 2021;8(9):e591-e598

Untreated menopause symptoms are linked to a lack of discussion with HIV care providers

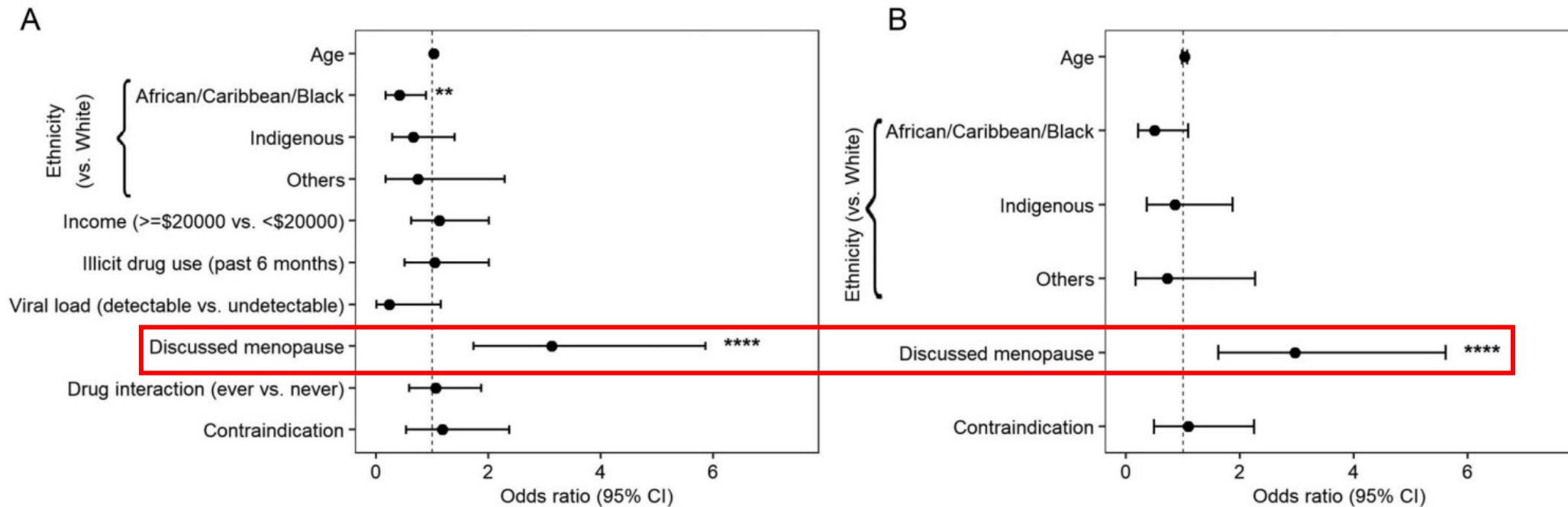
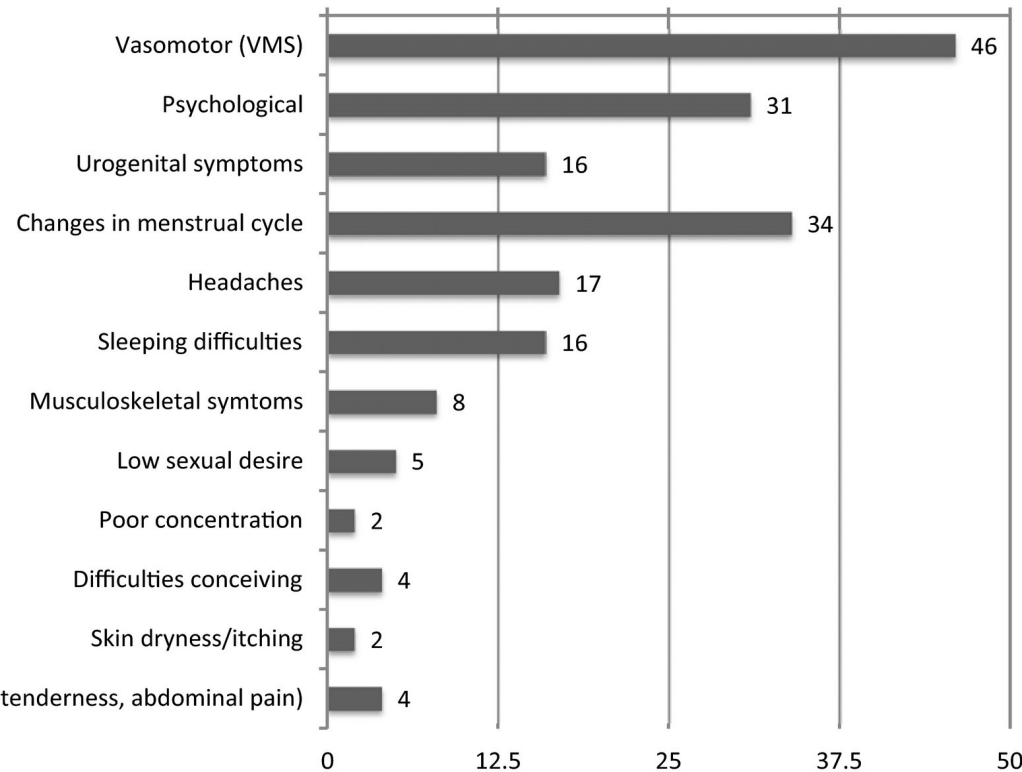


FIGURE 1. Univariable (A) and multivariable (B) analyses of factors associated with ever using menopausal hormone therapy in perimenopausal/menopausal women living with HIV (n = 464). ** $P < 0.05$; **** $P < 0.001$.

97.8% had regular HIV follow-up (71.8% with ID, 17.2% with general practitioner)
 44.8% ever discussed menopause (35.9% Black, 37.2% Indigenous vs 50.6% white)
 47.8% had a first-line indication for MHT
 11.8% ever used MHT (16.5% with early menopause)

Speak up! Women with HIV who are treated with MHT have menopause symptom improvement



Key:

- Vasomotor symptoms: hot flushes, sweats and palpitations
- Psychological symptoms: labile mood, depression, anxiety, irritability and fatigue
- Urogenital symptoms: vaginal dryness, urinary tract symptoms and dyspareunia
- Changes in menstrual cycle: Any change of normal menstrual cycle due to menopause transition
- Musculoskeletal symptoms: joint and/or muscle pains

HIV Menopause Clinic

- 55 women
- Average age: 49 years
- Average symptom duration: 31 months
- 73% prescribed MHT (transdermal patch > oral)
- Median MHT duration: 10 months
- 73% reported symptom improvement

Treatment options for menopause symptoms



Systemic menopause hormone therapy

- Estrogen (no uterus)
- Estrogen + progestin (uterus)



Topical hormone therapy

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Non-hormonal medication

- Sleep aids
- Antidepressants (citalopram, venlafaxine, paroxetine)
- Gabapentin
- Clonidine
- Oxybutynin
- Neurokinin B receptor antagonists

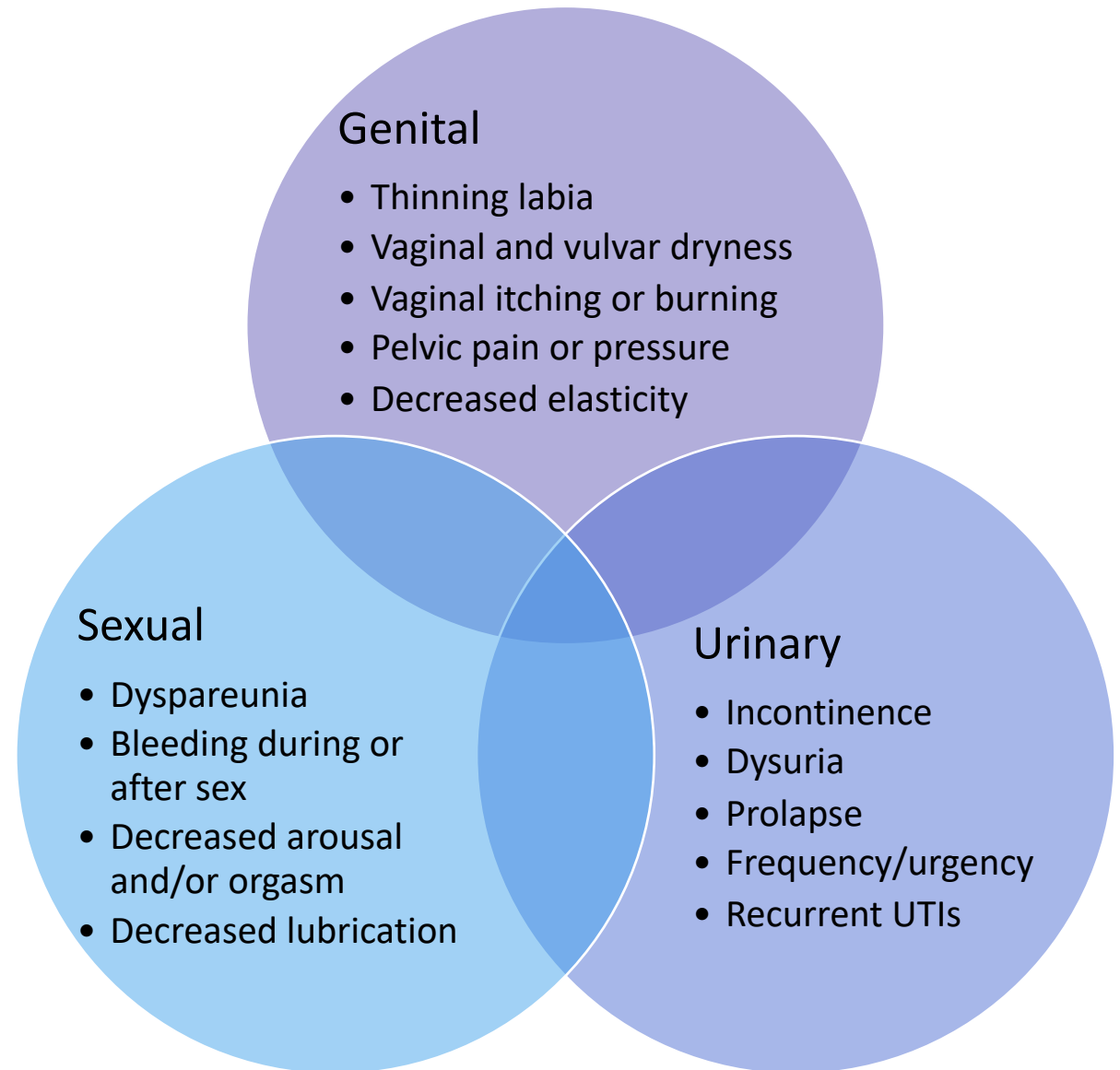


Non-pharmacologic treatments

- Cognitive behavioral therapy
- Hypnotherapy
- Acupuncture

Genitourinary Syndrome of Menopause

- Highly prevalent (up to 84% of women 6 years after menopause)
- Generally progressive (in contrast to vasomotor symptoms)
- Caused by estrogen withdrawal to vagina, vulva, and bladder
- Can be treated with nonhormonal (lubricants) and hormonal (vaginal estrogen) therapies



Treatment options for menopause symptoms



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Non-pharmacologic treatments

- Cognitive behavioral therapy
- Hypnotherapy
- Acupuncture

Nonhormone therapy for vasomotor symptoms

Recommended

- Cognitive-behavioral therapy
- Clinical hypnosis
- Weight loss
- SSRIs/SNRIs
 - Paroxetine*, escitalopram, citalopram, venlafaxine, desvenlafaxine (large RCTs)
 - Duloxetine (smaller studies)
- Gabapentin
- Oxybutynin
- Fezolinetant* (neurokinin B antagonist)
- Stellate ganglion block

*FDA approved indication for VMS

Not recommended

- Cooling techniques
- Avoiding triggers (e.g., alcohol, caffeine, spicy foods, hot beverages)
- Exercise and yoga
- Dietary modifications (e.g., soy, plant-based)
- Mindfulness-based interventions, paced respiration, relaxation
- Pregabalin
- Clonidine
- Suvorexant
- Dietary supplements
- Cannabinoids
- Acupuncture

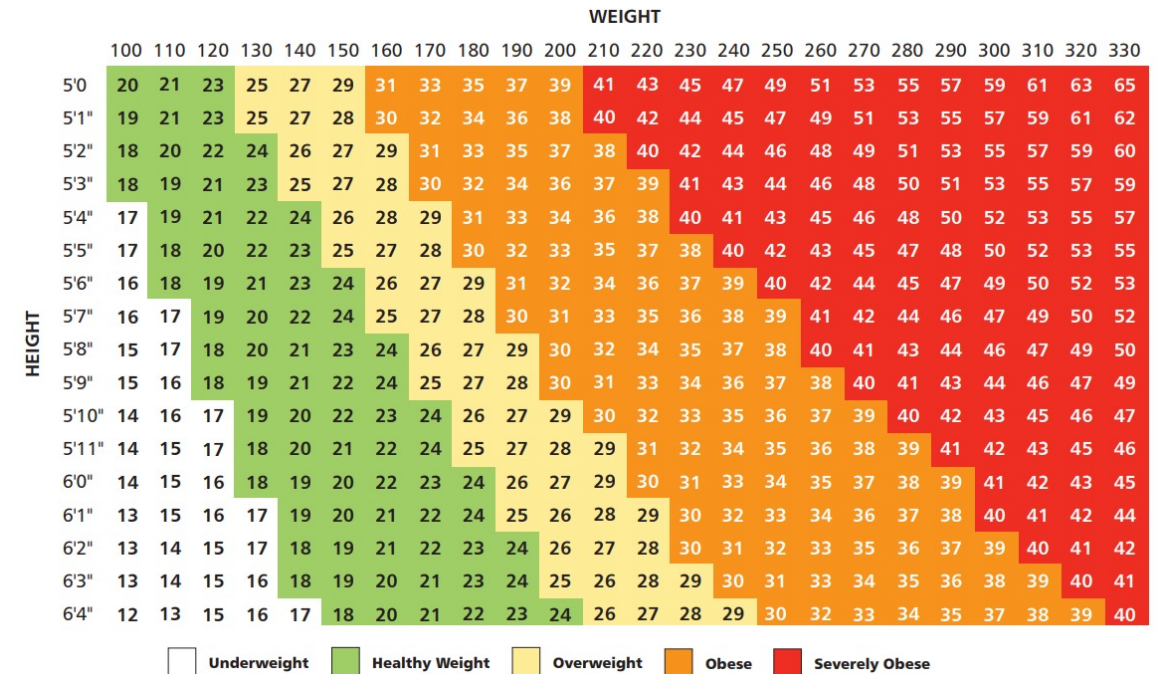
Weight Gain and Obesity in Women with HIV

Obesity

Antiretroviral Therapy

What is obesity?

- Obesity is:
 - Weight that is higher than what is considered healthy for a given height (BMI ≥ 30 kg/m²)
 - A chronic medical condition
 - Very common (41% of U.S. adults have obesity)
 - Associated with stigma and difficulty accessing medical care
- Obesity is NOT:
 - A sign of laziness, disregard for health, or lack of self-control
- Not all obesity is the same:
 - Sarcopenic obesity (lack of muscle)
 - Abdominal obesity



Source: <https://www.cdc.gov/obesity/index.html>
<https://www.eatsmartmovemorenc.com/resource/bmi-chart/>

Many Americans lack healthy, affordable foods and places to be active.



More than **half of Americans** don't live within half a mile of a park.



40% of all US households do not live within 1 mile of healthier food retailers.

BMI cutoffs may vary by sex and race

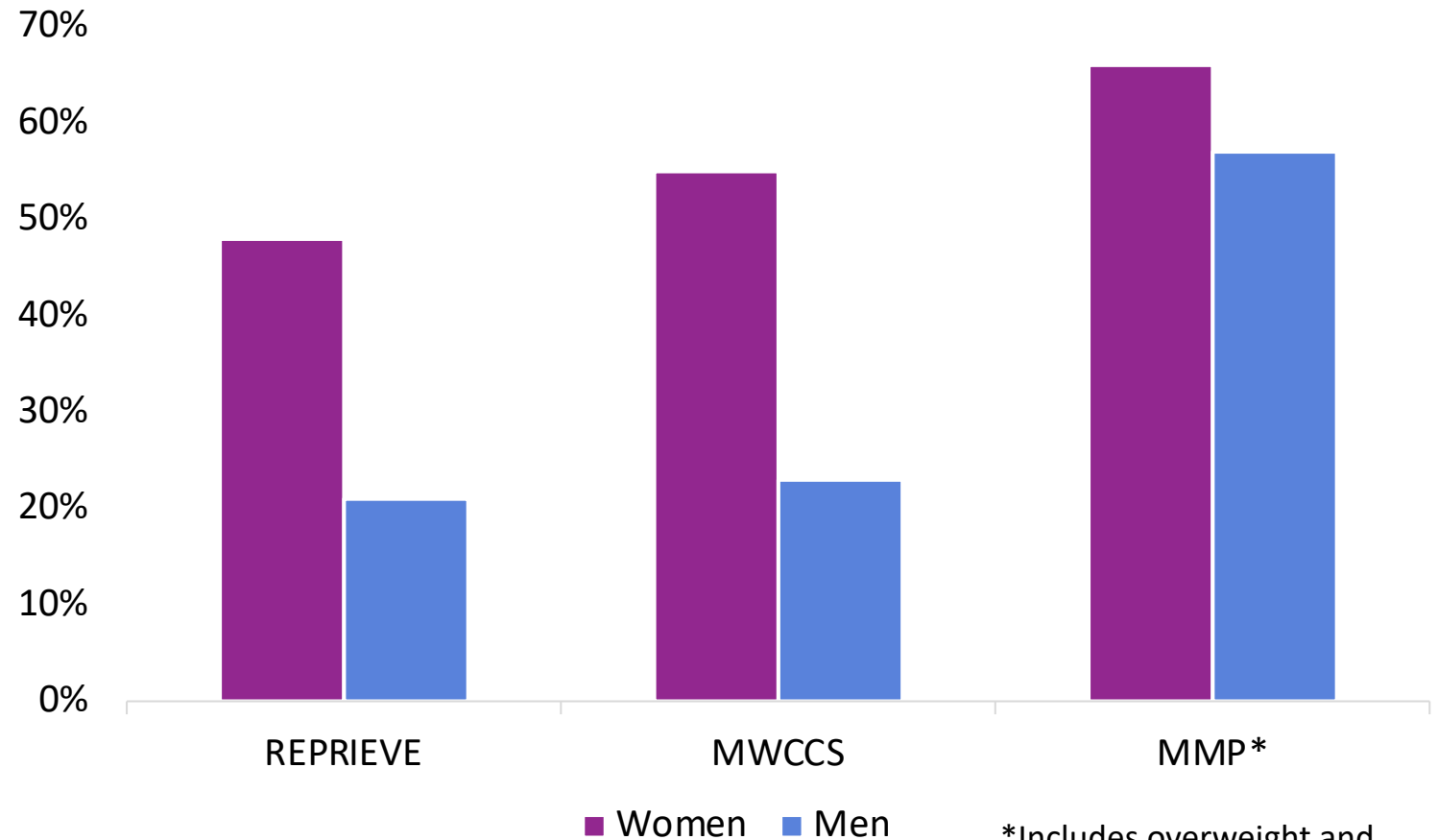
TABLE. Cutoffs for BMI Based on ROC Curve Analysis

Obesity Co-morbidity	BMI (kg/m ²)					
	Men			Women		
	Black	Hispanic	White	Black	Hispanic	White
Hypertension	28	29	28	31	28	27
Dyslipidemia	27	26	27	29	27	25
Diabetes	29	29	30	33	30	29
≥2 risk factors	28	29	29	31	30	28
Average	28	28	29	31	29	27

BMI = body mass index; ROC = receiver operating characteristic.

Obesity is more common in women than men with HIV in the US

Prevalence of Obesity among People with HIV in Three U.S.-based Cohort Studies, Stratified by Sex



1. Zanni ZM et al. *Clin Infect Dis*, 2023;76(2):323-334
2. D'Souza G et al. *Am J Epi*, 2021;190(8):1457-1475
3. Frazier EL et al. *Clin Infect Dis*, 2019;69(12):2091-2100

Obesity complications in people with HIV

Heart disease

Stroke

Type 2 diabetes

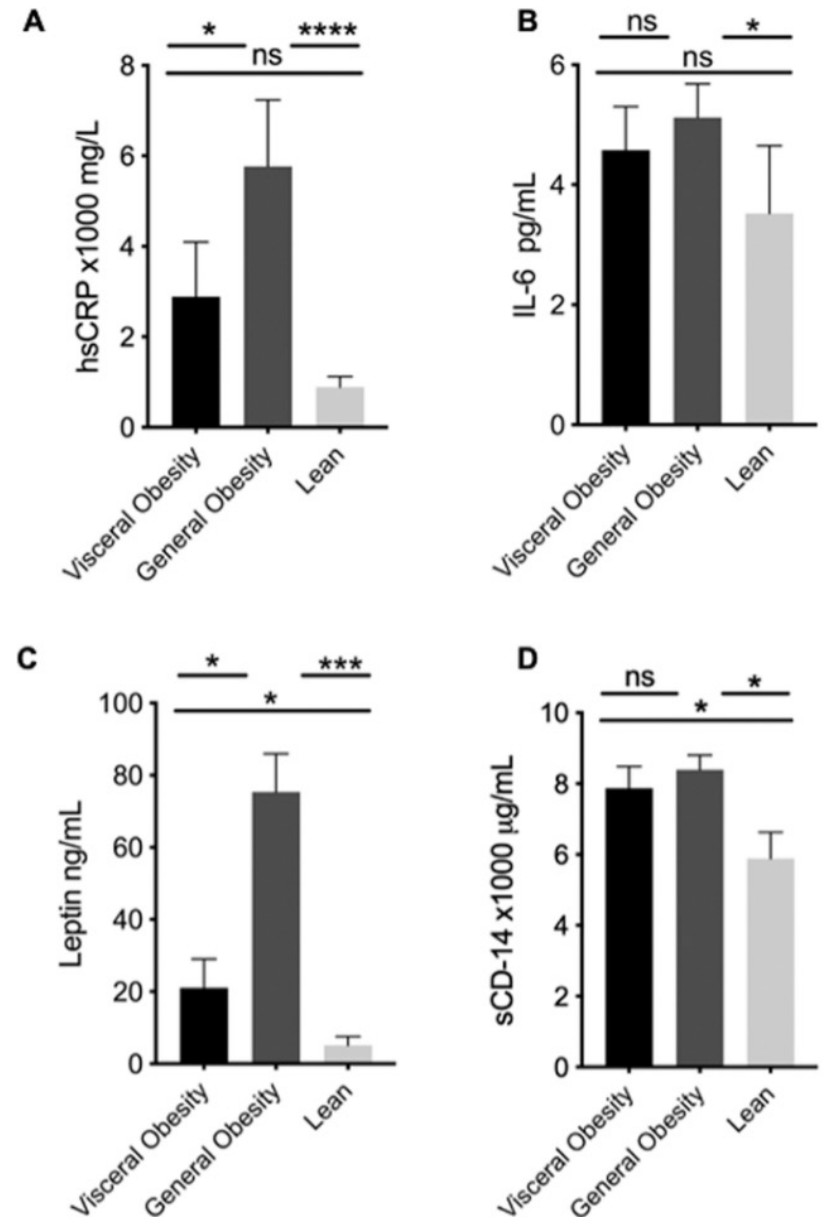
Certain types of cancers

Obstructive sleep apnea

Osteoarthritis

Increased inflammation

Intestinal dysbiosis



Treatments for obesity includes lifestyle, medical, and surgical interventions



Goal: to prevent, treat, or reverse complications of obesity and improve quality of life



Lifestyle measures:
everyone

Low calorie diet, 150 minutes
of exercise/week
5-7% weight loss



Medical: BMI ≥ 30 or 27-29
with certain medical
conditions

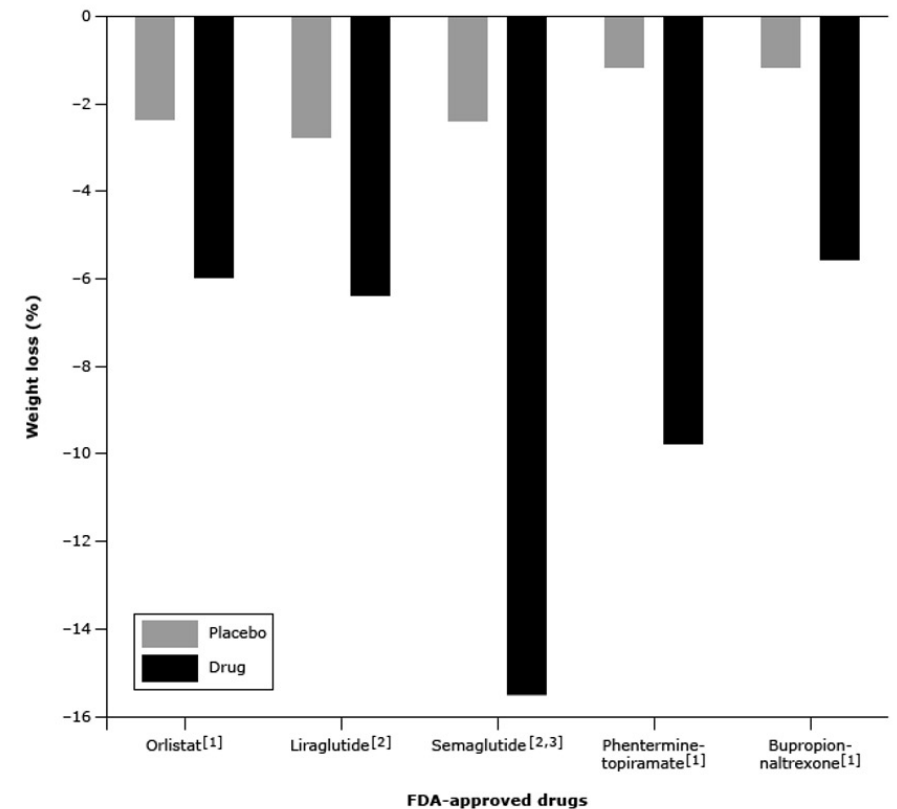
GLP-1 Receptor Agonists
(semaglutide, liraglutide)
5-15% weight loss
Side effects, availability



Surgical: BMI ≥ 40 or 35-39
with certain medical
conditions

Gastric banding, gastric
bypass
Up to 40% weight loss

Weight loss outcomes with FDA-approved medications

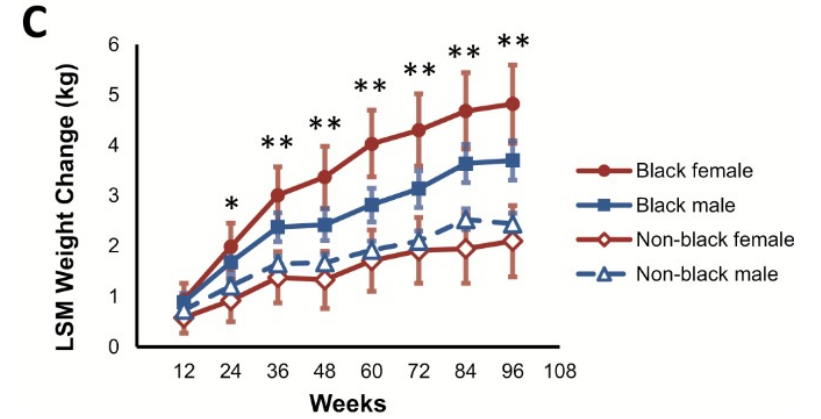
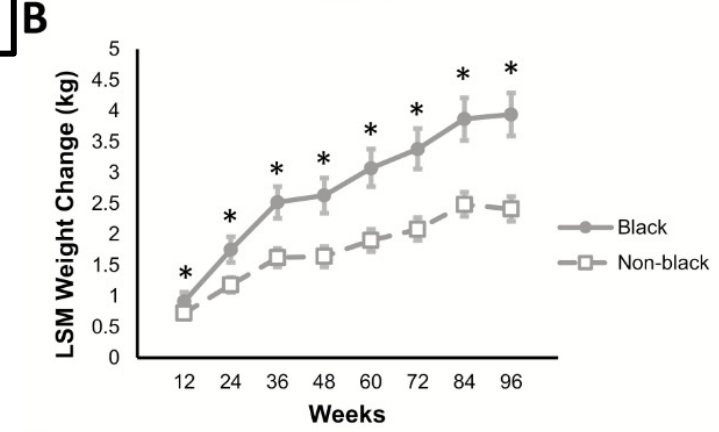
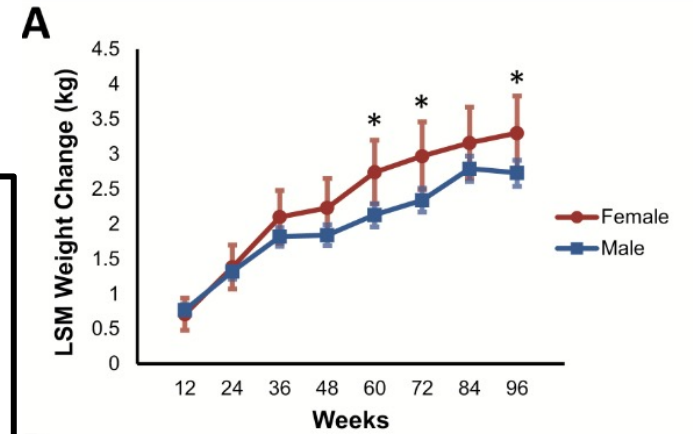
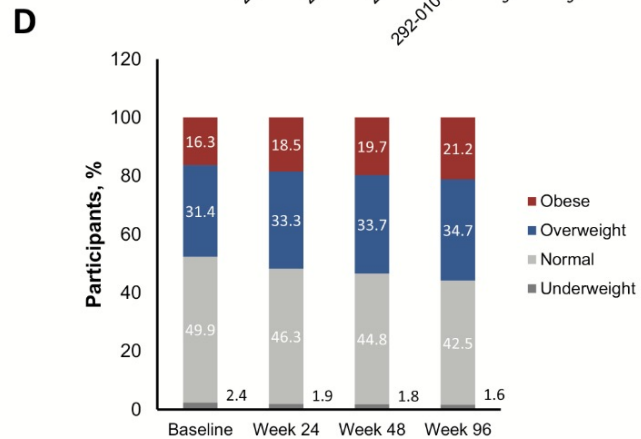
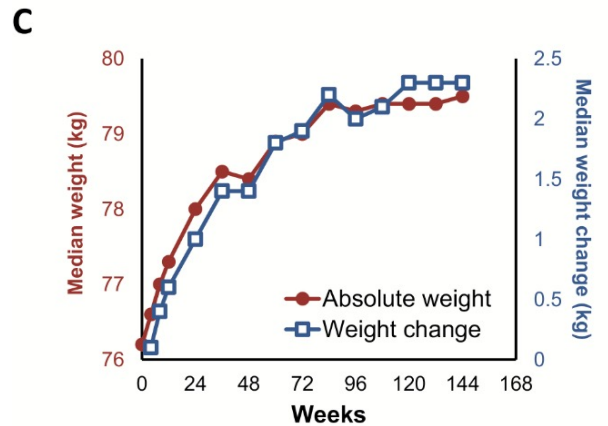
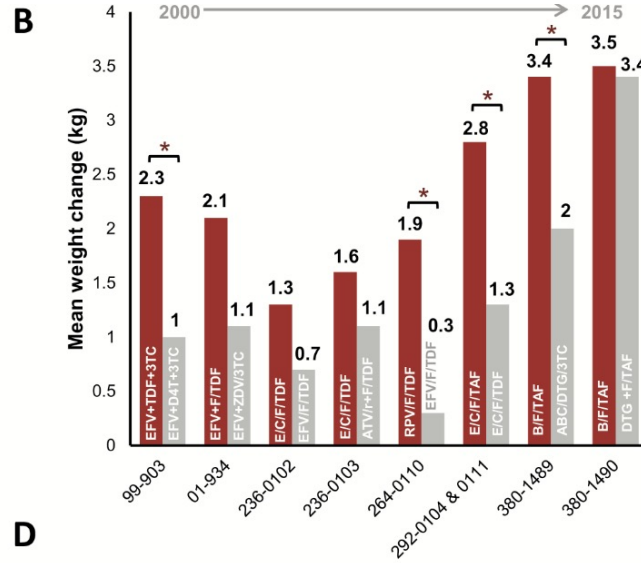
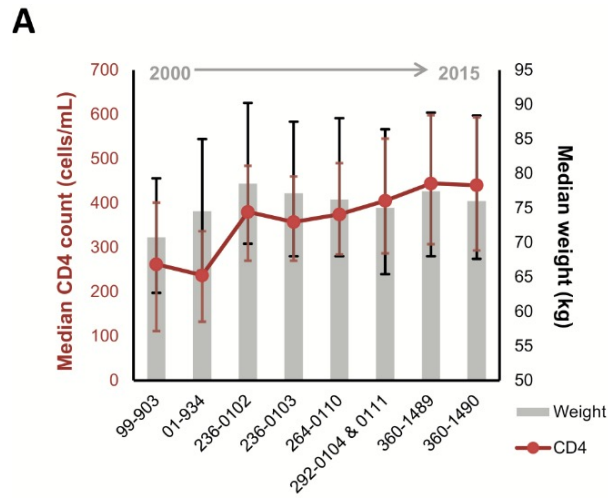


Perreault L. *UpToDate*. 2022

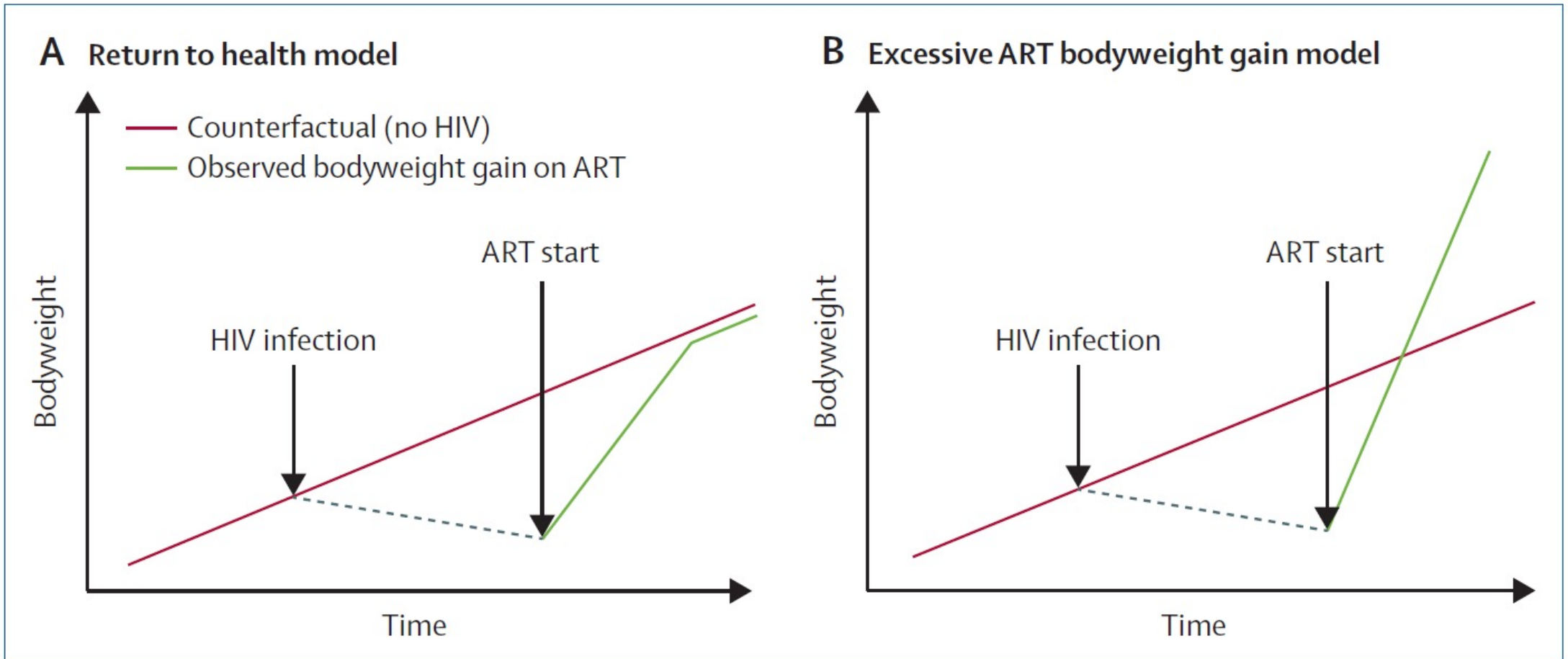
McCarty TR et al. *Bariatr Surg Pract Patient Care*. 2020;15(3):116-123

Weight gain is common after starting ART

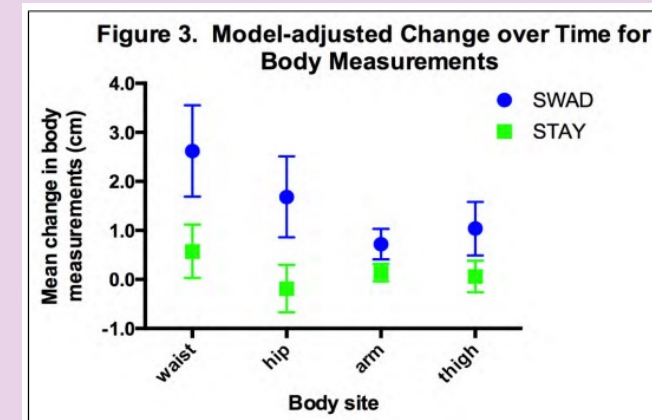
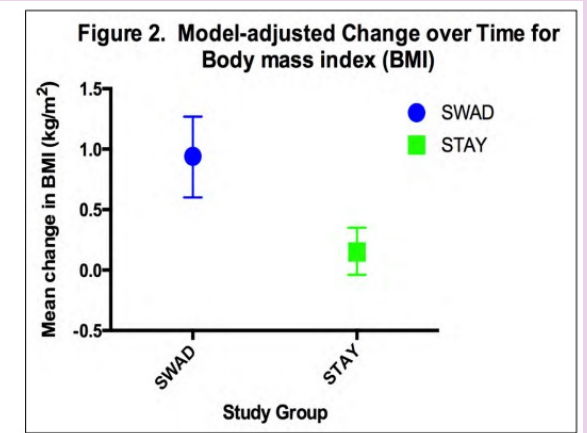
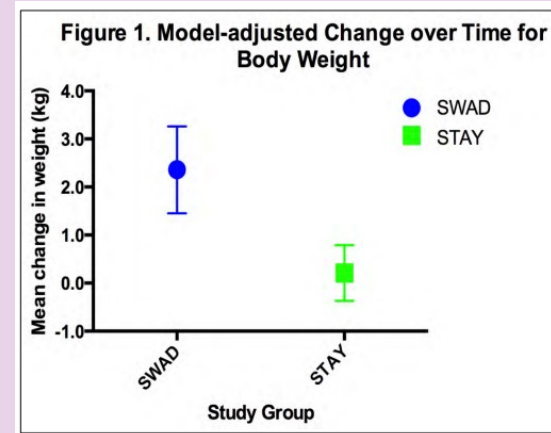
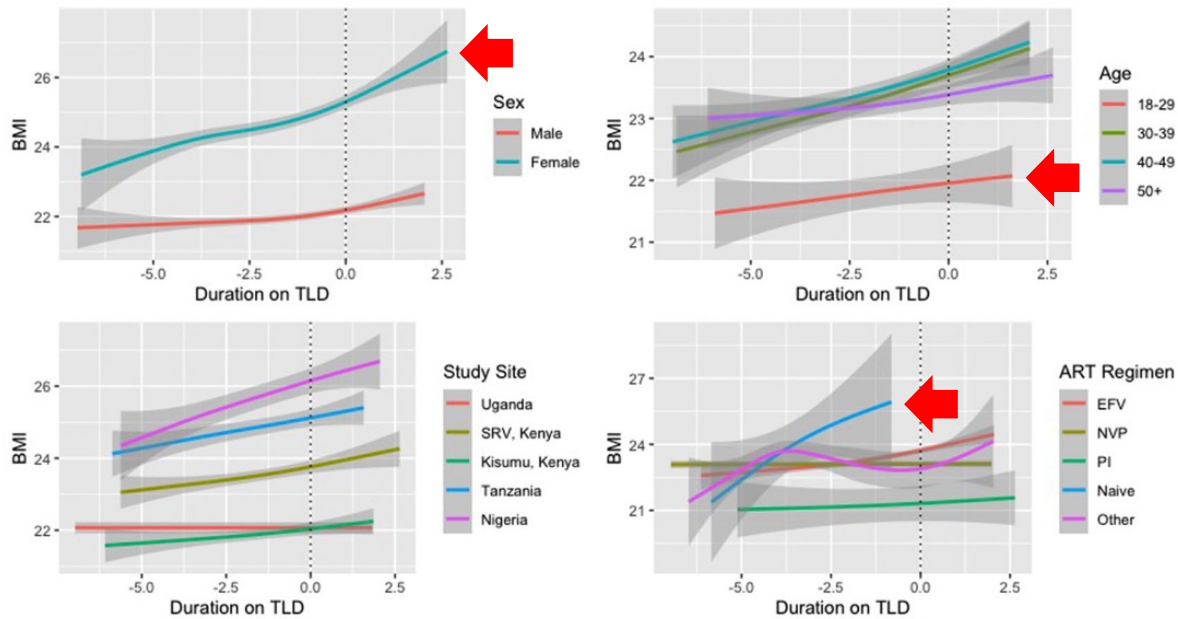
Most weight gain with INSTI- or TAF-containing regimens



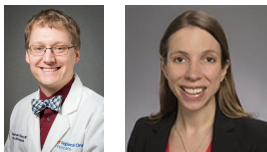
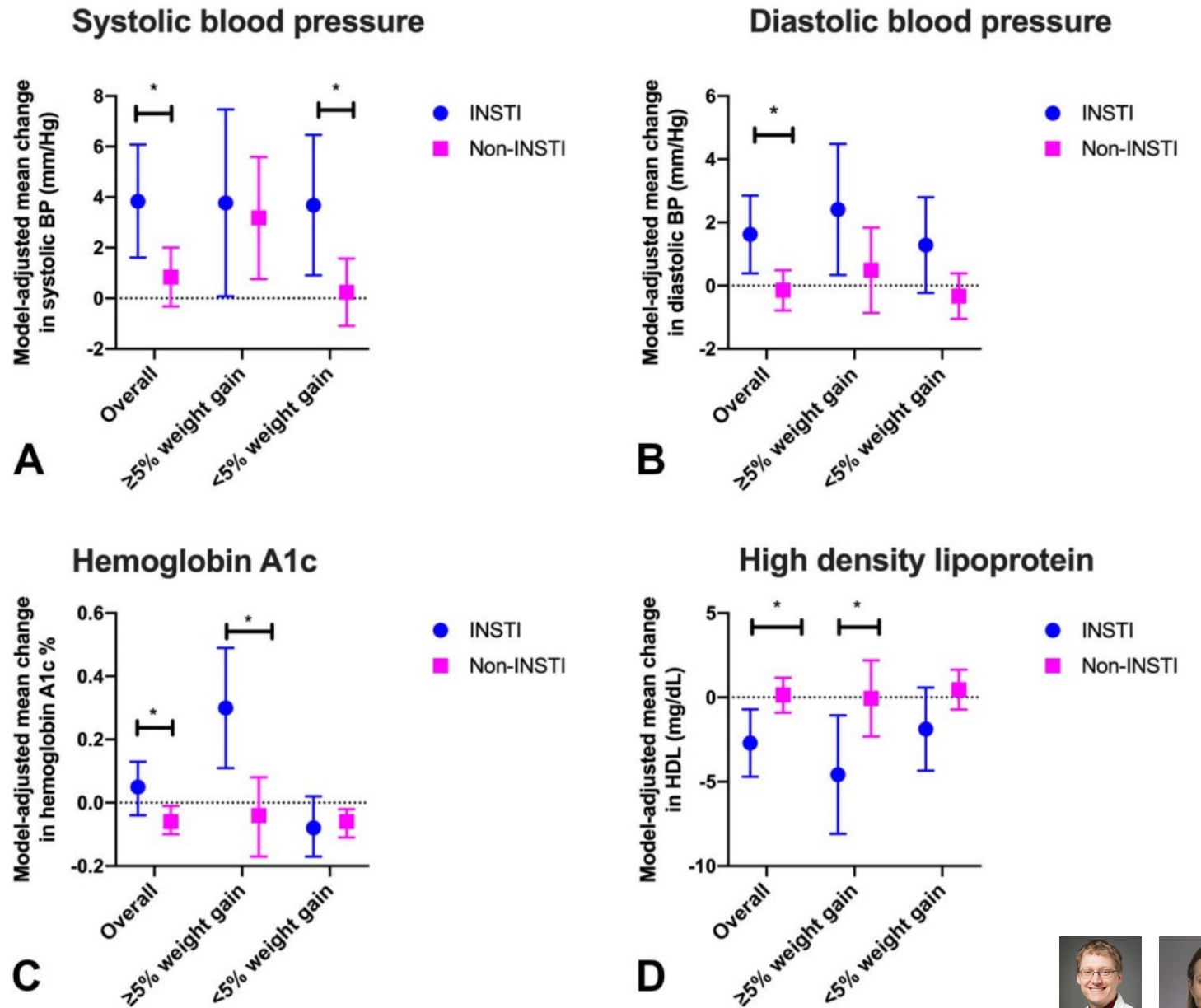
It is still unknown if ART-related weight gain is expected or excessive



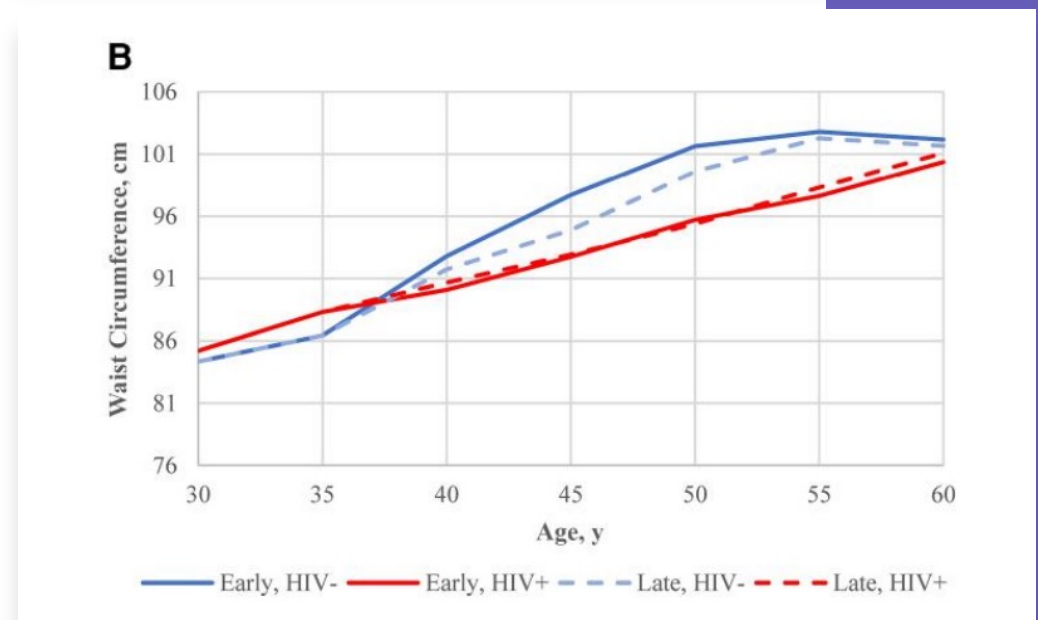
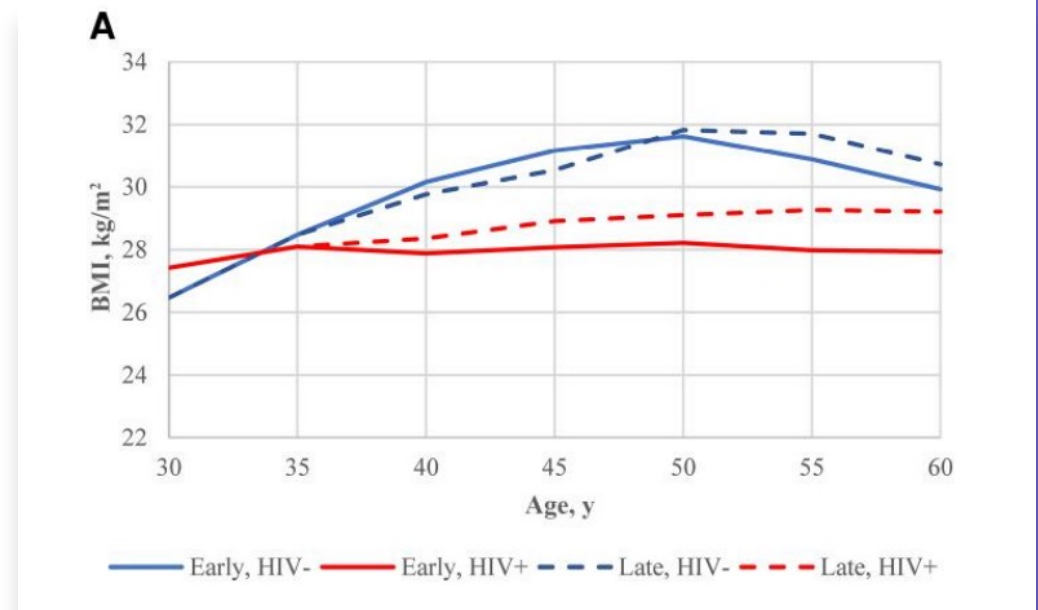
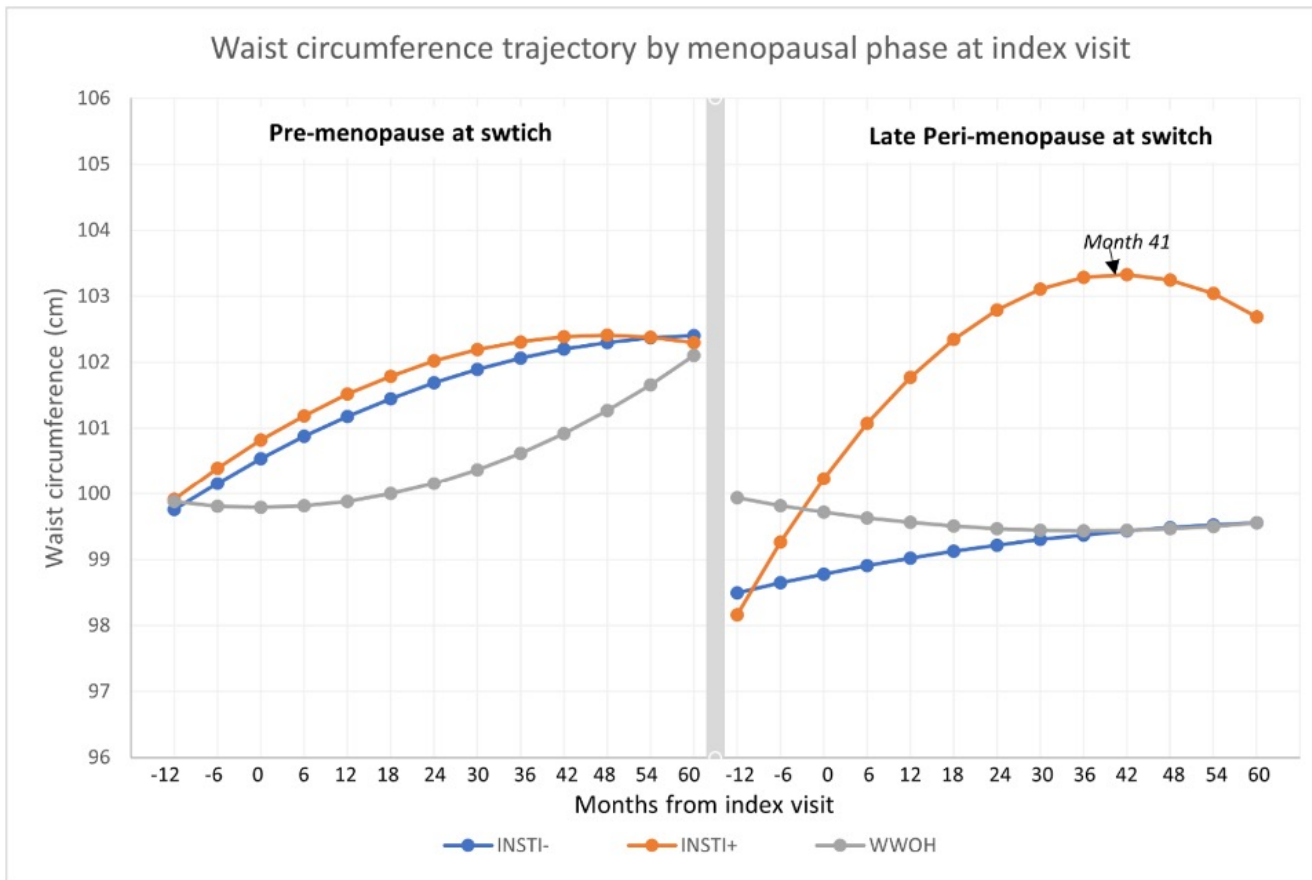
Weight gain is associated with switching to INSTIs in virally-suppressed people with HIV



ART-associated weight gain is associated with cardiometabolic effects in women with HIV



Menopause may modify HIV- and INSTI-associated weight gain



In summary

Overweight and obesity are common in women living with HIV

Obesity is associated with several health complications

Weight gain in women living with HIV may be related to ART class and menopause

Reducing Cardiovascular Risk in Women with HIV

Risk Calculators

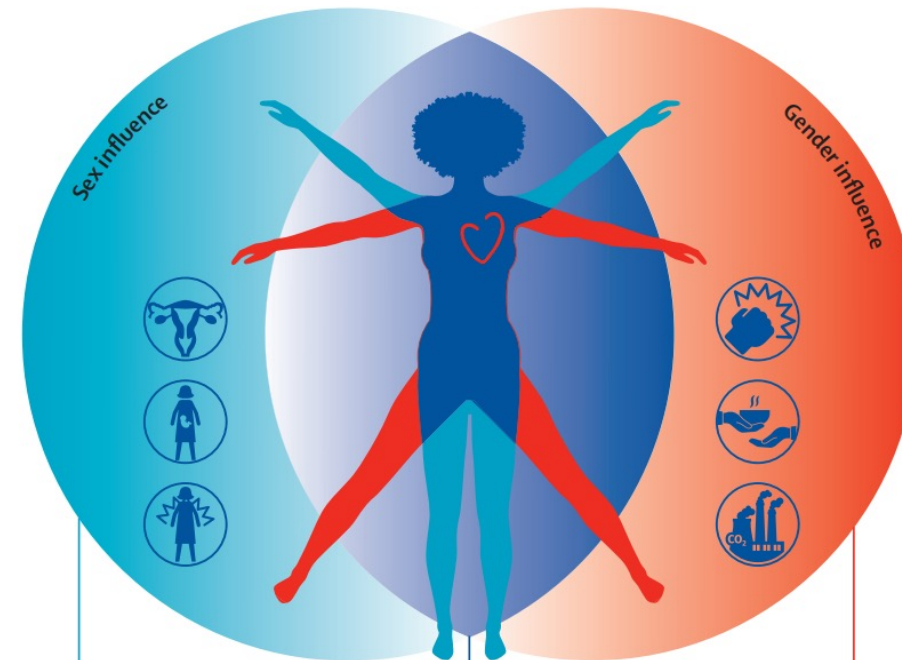
Statins

Important numbers to know



Heart disease in women

- Leading cause of death in women worldwide
- Improvements in prevalence and mortality have slowed over the past decade
- Rates are increasing among younger women
- Risk in women is often underestimated by both patients and healthcare providers



Sex-specific risk factors

- Premature menopause
- Gestational diabetes
- Hypertensive disorders of pregnancy
- Preterm delivery
- Polycystic ovary syndrome
- Systemic inflammatory and autoimmune disorders*

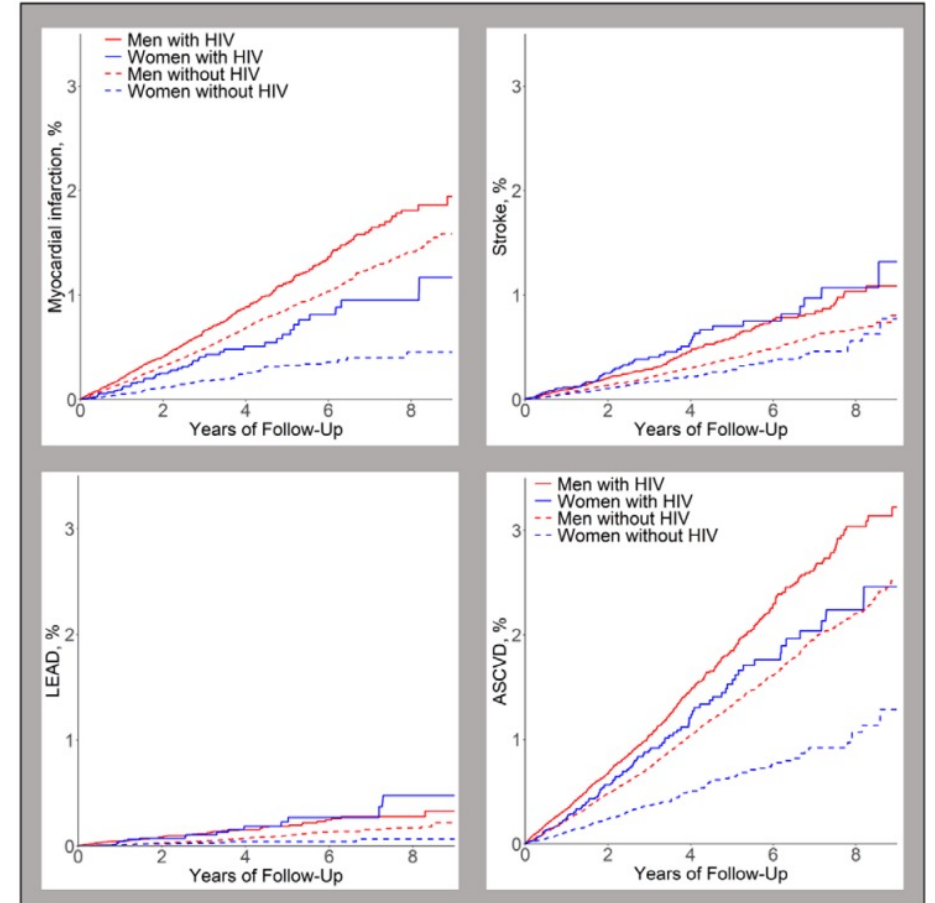
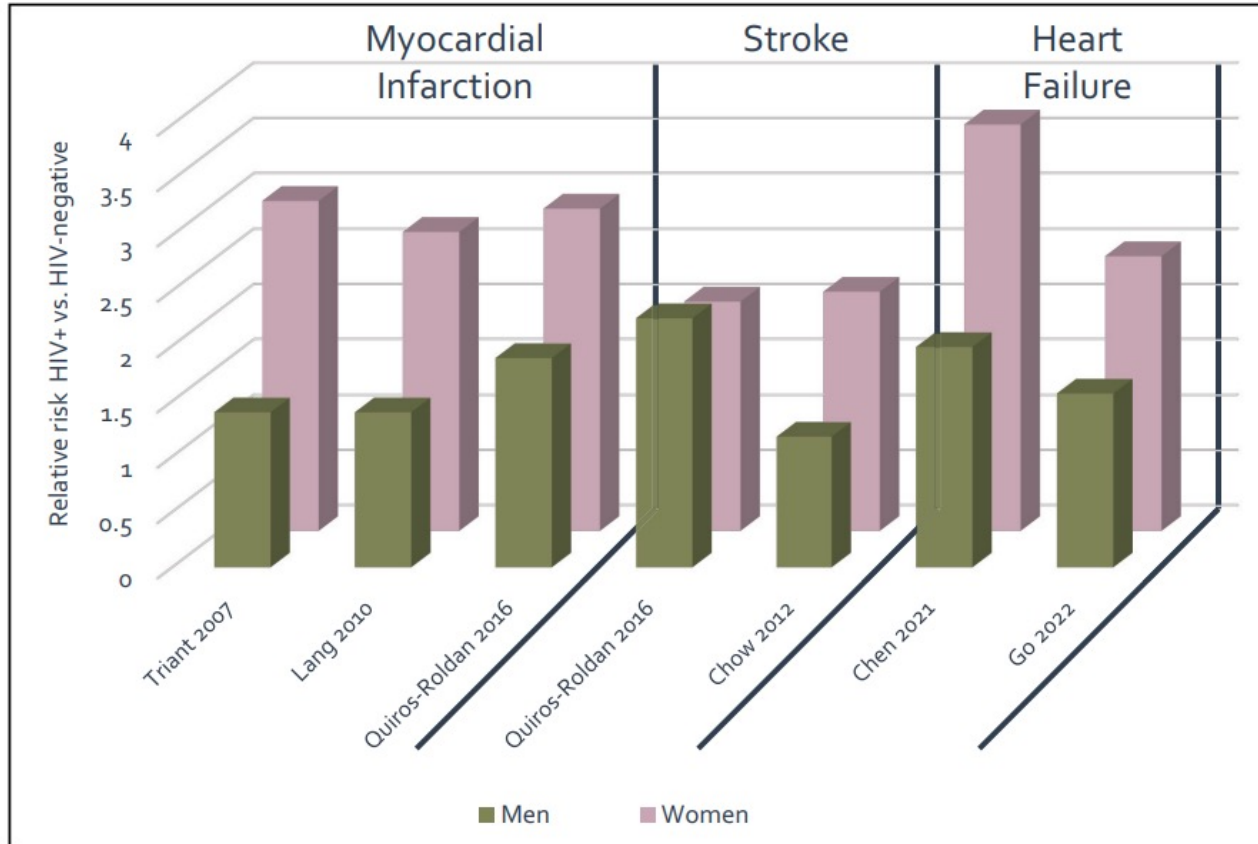
Well-established risk factors

- Hypertension
- Dyslipidaemia
- Diabetes
- Obesity
- Unhealthy diet
- Sedentary lifestyle
- Smoking or tobacco use

Under-recognised risk factors

- Psychosocial risk factors
- Abuse and intimate partner violence
- Socioeconomic deprivation
- Poor health literacy
- Environmental risk factors

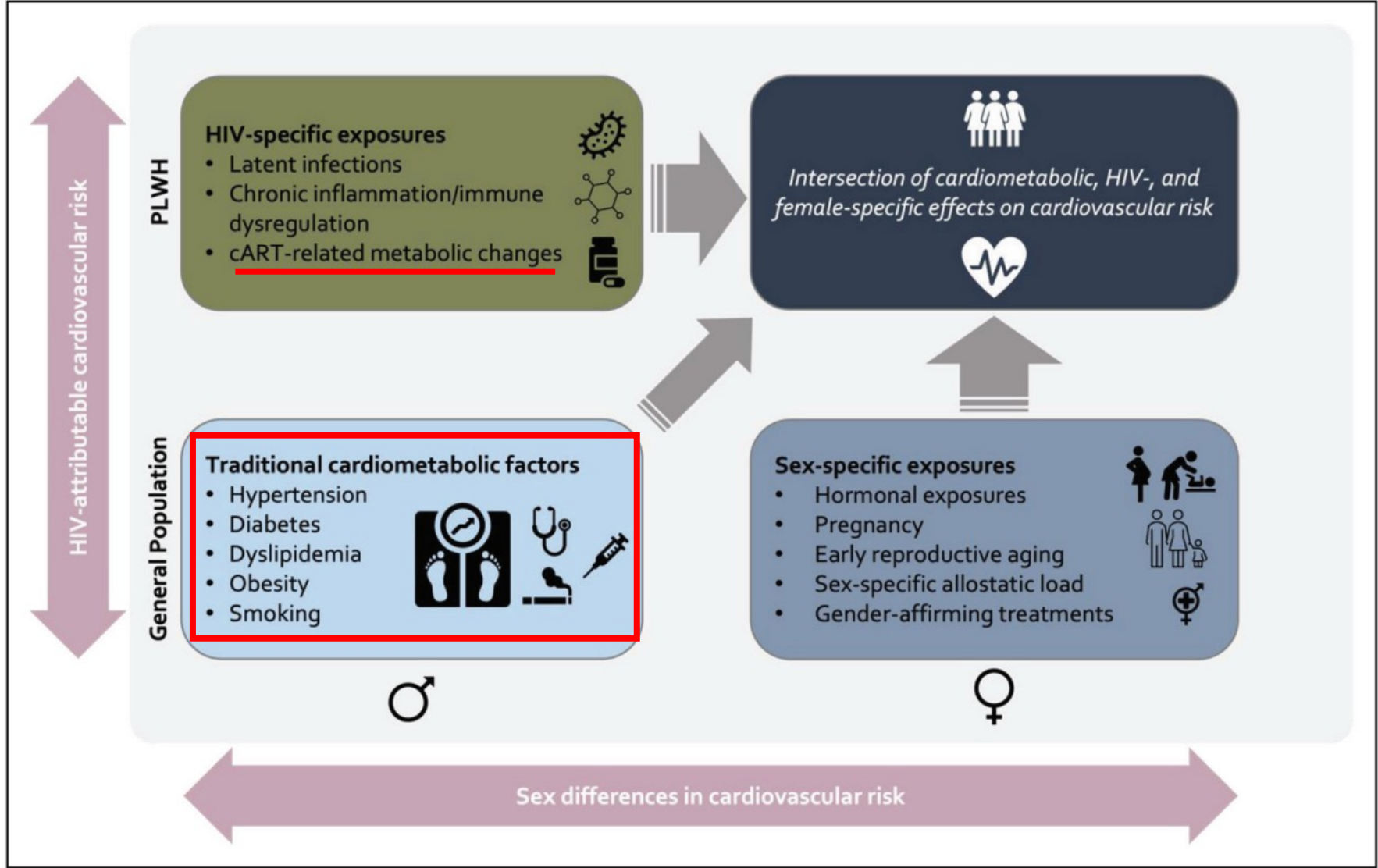
The relative risk of CVD in people with HIV is greater in women than in men



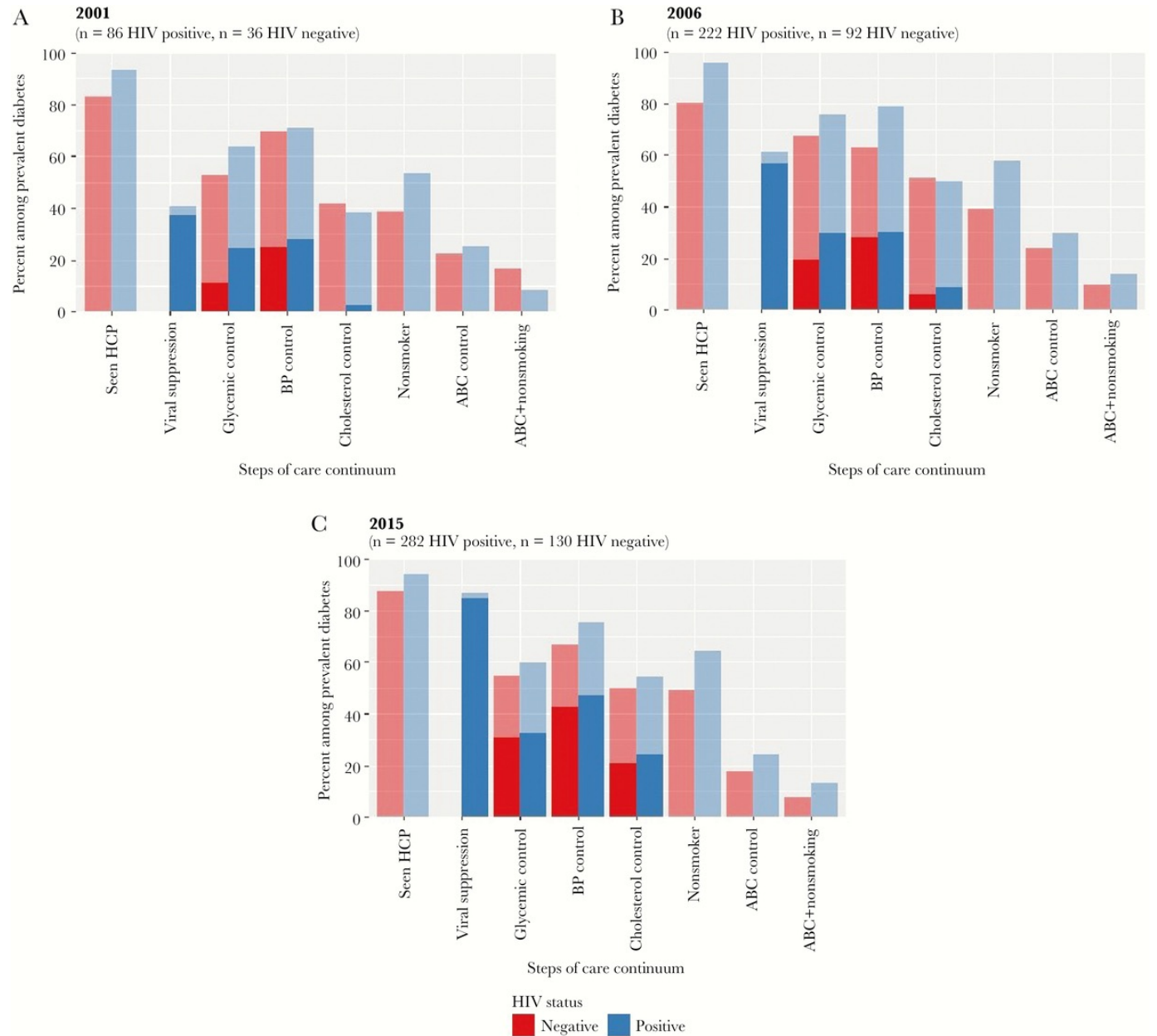
Kentoffio K et al. *Curr Opin HIV AIDS* 2022;17(5):270-278

Wise J et al. *AIDS* 2023;May.[Epub ahead of print]

Mechanisms of CVD in Women with HIV

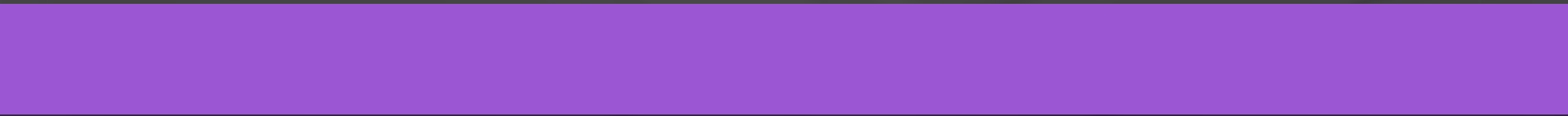


There is room for improvement in blood pressure, cholesterol, and diabetes control for women with and without HIV





Calculating your CVD risk



2013 ACC/AHA Pooled Cohort Equation ASCVD Risk Calculator

Current Age ⓘ *

Age must be between 20-79

Sex *

Male	Female
------	--------

Race *

White	African American	Other
-------	------------------	-------

Systolic Blood Pressure (mm Hg) *

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) *

Value must be between 60-130

Total Cholesterol (mg/dL) *

Value must be between 130 - 320

HDL Cholesterol (mg/dL) *

Value must be between 20 - 100

LDL Cholesterol (mg/dL) ⓘ ○

Value must be between 30-300

History of Diabetes? *

Yes	No
-----	----

Smoker? ⓘ *

Current ⓘ	Former ⓘ	Never ⓘ
-----------	----------	---------

On Hypertension Treatment? *

Yes	No
-----	----

On a Statin? ⓘ ○

Yes	No
-----	----

On Aspirin Therapy? ⓘ ○

Yes	No
-----	----

<https://tools.acc.org/ascvd-risk-estimator-plus/#!/calculate/estimate/>

2013 ACC/AHA Pooled Cohort Equation ASCVD Risk Calculator

Current Age ⓘ *

55

Age must be between 20-79

Sex *

Male

✓ Female

Race *

White

✓ African American

Other

Systolic Blood Pressure (mm Hg) *

145

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) *

9.6%
Intermediate

**Current 10-Year
ASCVD Risk****

Total Cholesterol (mg/dL) *

190

Value must be between 130 - 320

Lifetime ASCVD Risk: **39%**

Optimal ASCVD Risk: **1.8%**

Value must be between 50-300

History of Diabetes? *

Yes

✓ No

Smoker? ⓘ *

Current ⓘ

Former ⓘ

✓ Never ⓘ

On Hypertension Treatment? *

✓ Yes

No

On a Statin? ⓘ ○

Yes

✓ No

On Aspirin Therapy? ⓘ ○

Yes

✓ No

<https://tools.acc.org/ascvd-risk-estimator-plus/#!/calculate/estimate/>

2013 ACC/AHA Pooled Cohort Equation ASCVD Risk Calculator: Impact of Hypertension Control

Current Age ⓘ *

55

Age must be between 20-79

Sex *

Male

✓ Female

Race *

White

✓ African American

Other

Systolic Blood Pressure (mm

120

Value must be between 90-200

5.1%
Borderline

**Current 10-Year
ASCVD Risk****

Lifetime ASCVD Risk: **39%** Optimal ASCVD Risk: **1.8%**

Total Cholesterol (mg/dL) *

190

Value must be between 130 - 320

40

Value must be between 20 - 100

130

Value must be between 30-300

History of Diabetes? *

Yes

✓ No

Smoker? ⓘ *

Current ⓘ

Former ⓘ

✓ Never ⓘ

On Hypertension Treatment? *

✓ Yes

No

On a Statin? ⓘ ○

Yes

✓ No

On Aspirin Therapy? ⓘ ○

Yes

✓ No

<https://tools.acc.org/ascvd-risk-estimator-plus/#!/calculate/estimate/>

2013 ACC/AHA Pooled Cohort Equation ASCVD Risk Calculator

Current Age ⓘ *

55

Age must be between 20-79

Sex *

Male

✓ Female

Race *

White

✓ African American

Other

Systolic Blood Pressure (mm Hg) *

145

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) *

Total Cholesterol (mg/dL) *

190

Value must be between 130 - 320

9.6%
Intermediate

Current 10-Year ASCVD Risk**

Lifetime ASCVD Risk: 39%

Optimal ASCVD Risk: 1.8%

History of Diabetes? *

Yes

✓ No

Smoker? ⓘ *

Current ⓘ

Former ⓘ

✓ Never ⓘ

On Hypertension Treatment? *

✓ Yes

No

On a Statin? ⓘ ○

Yes

✓ No

On Aspirin Therapy? ⓘ ○

Yes

✓ No

<https://tools.acc.org/ascvd-risk-estimator-plus/#!/calculate/estimate/>

2013 ACC/AHA Pooled Cohort Equation ASCVD Risk Calculator: Impact of Smoking

Current Age ⓘ *

55

Age must be between 20-79

Sex *

Male

✓ Female

Race *

White

✓ African American

Other

Systolic Blood Pressure (mm Hg) *

145

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) *

18.3%
Intermediate

Current 10-Year ASCVD Risk**

Lifetime ASCVD Risk: 50% **Optimal ASCVD Risk: 1.8%**

Total Cholesterol (mg/dL) *

190

Value must be between 130 - 320

History of Diabetes? *

Yes

✓ No

Smoker? ⓘ *

✓ Current ⓘ

Former ⓘ

Never ⓘ

On Hypertension Treatment? *

✓ Yes

No

On a Statin? ⓘ ○

Yes

✓ No

On Aspirin Therapy? ⓘ ○

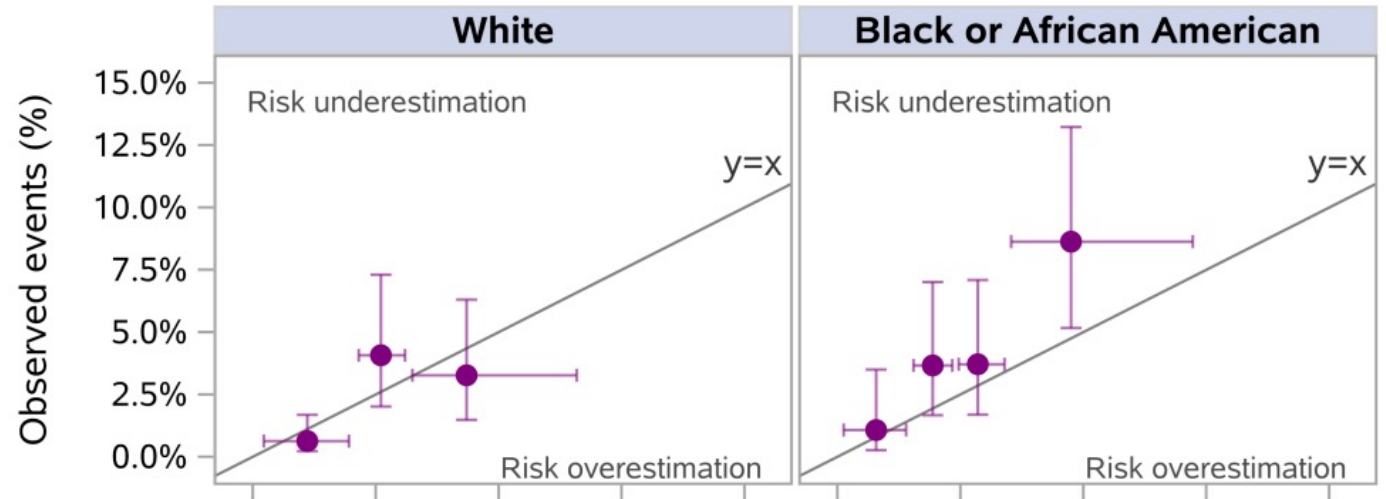
Yes

✓ No

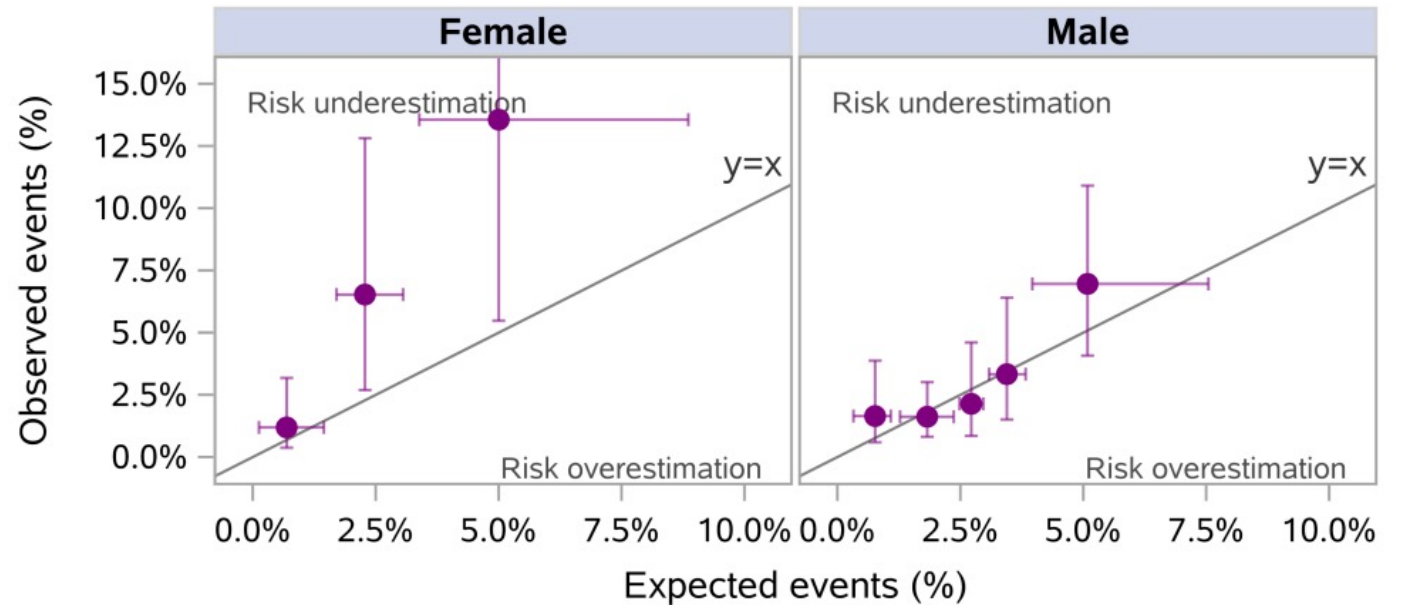
<https://tools.acc.org/ascvd-risk-estimator-plus/#!/calculate/estimate/>

The 2013 ACC/AHA Pooled Cohort Equation ASCVD Risk Calculator may underestimate ASCVD risk in women with HIV

(b) By Race (within High Income)



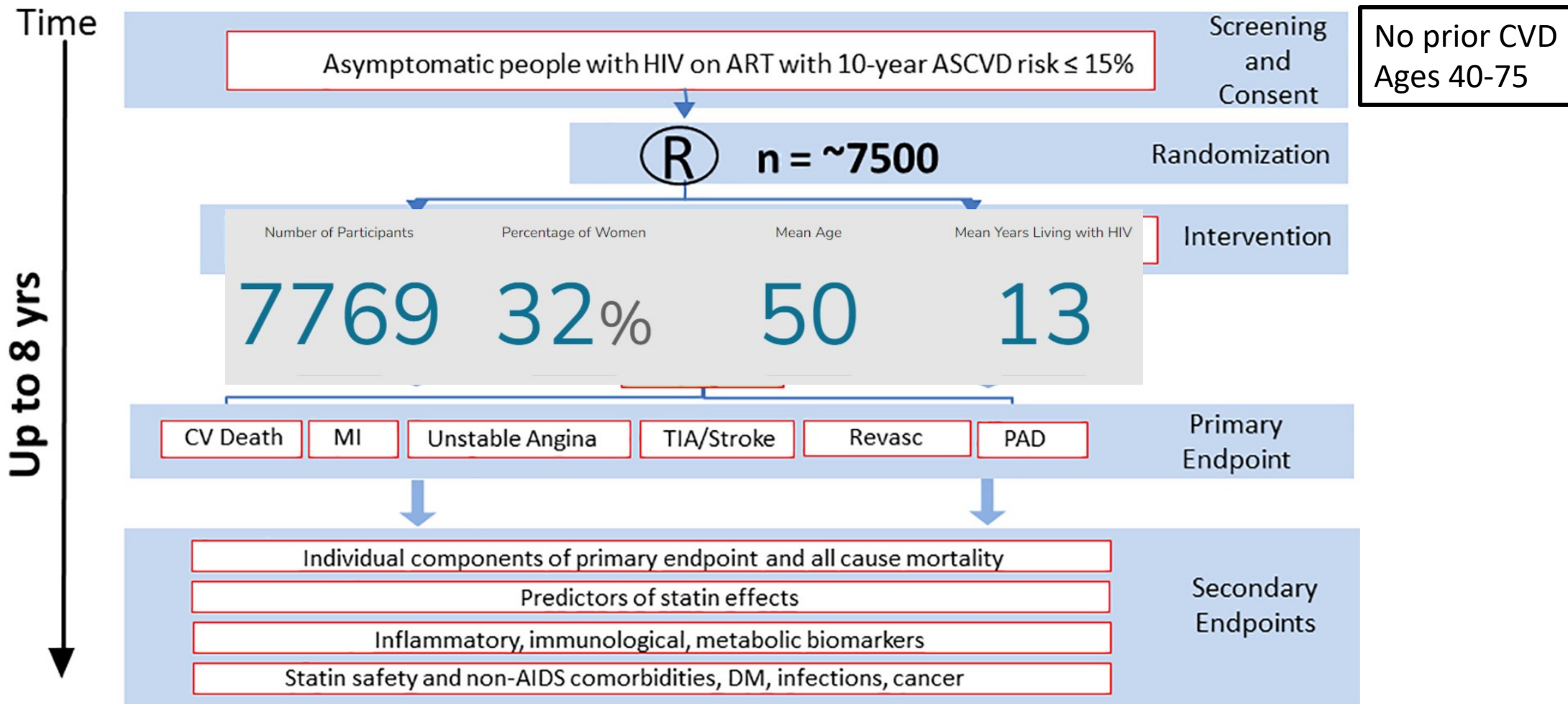
(c) By Sex (within High Income)





REPRIEVE

Randomized Trial to Prevent Vascular Events in HIV



NEWS RELEASES

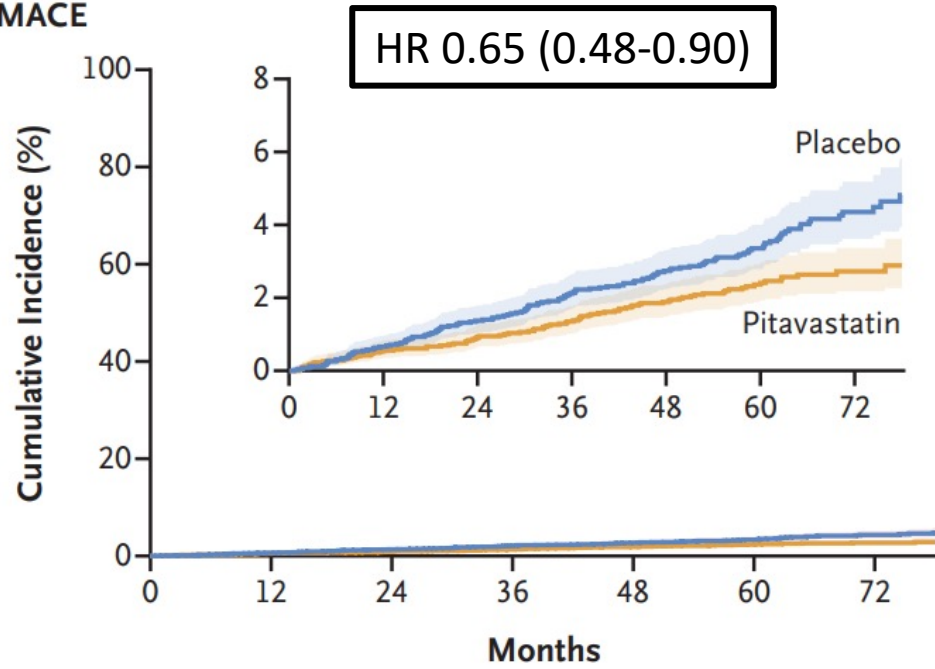
Tuesday, April 11, 2023

Daily statin reduces the risk of cardiovascular disease in people living with HIV, large NIH study finds



4 mg pitavistatin daily lowered the risk of major adverse cardiac events by 35% compared to placebo in people living with HIV without underlying heart disease

B First MACE



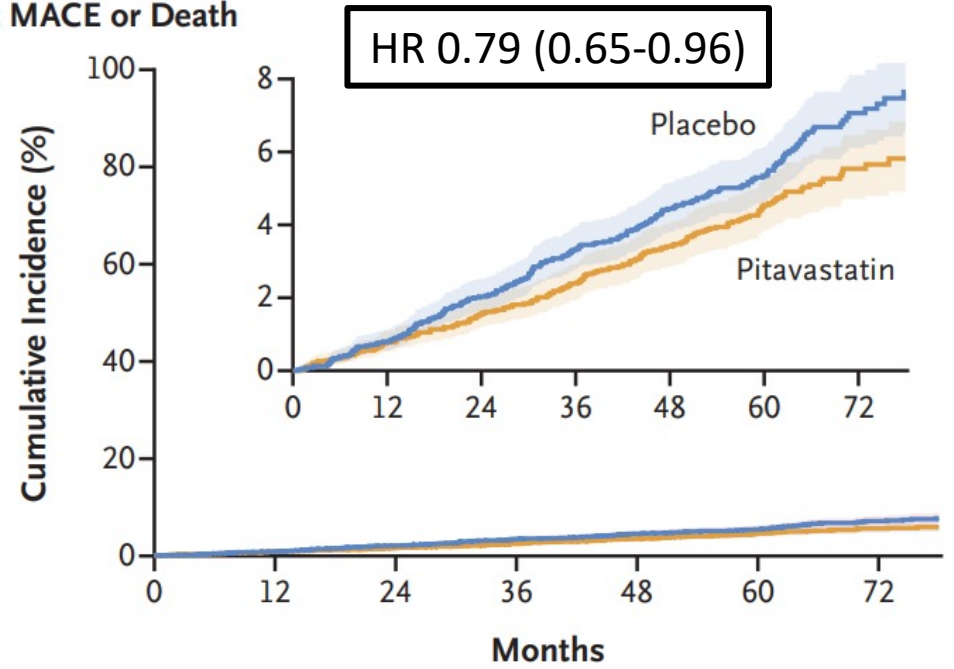
Cumulative Incidence of Event (%)

Placebo	0.00	0.66	1.38	2.14	2.74	3.36	4.36
Pitavastatin	0.00	0.56	0.95	1.35	1.89	2.41	2.73

No. at Risk

Placebo	3881	3693	3506	3356	2997	2182	959
Pitavastatin	3888	3647	3475	3364	2997	1947	1052

C First MACE or Death



Cumulative Incidence of Event (%)

Placebo	0.00	0.80	2.03	3.34	4.44	5.35	7.06
Pitavastatin	0.00	0.77	1.58	2.39	3.40	4.54	5.54

No. at Risk

Placebo	3881	3693	3506	3356	2997	1975	919
Pitavastatin	3888	3647	3475	3364	2998	1948	1027

Standard Recommendations for Statin Therapy in the General Population

Key Recommendations for the General Population (Including People with HIV) Based on AHA/ACC/Multisociety Guidelines

For people age 40-75 years who have high ($\geq 20\%$) 10-year ASCVD risk estimates

- Initiate high-intensity statin therapy

For people age 20-75 years who have low-density lipoprotein cholesterol (LDL-C) ≥ 190 mg/dL

- Initiate high-intensity statin therapy at maximum tolerated dose

For people age 40-75 years with diabetes mellitus

- Initiate at least moderate-intensity statin therapy. Perform further risk assessment to consider using a high-intensity statin

New Statin Recommendations for People Living with HIV

Recommendations for the Use of Statin Therapy as Primary Prevention of Atherosclerotic Cardiovascular Disease (ASCVD) in People with HIV

For people with HIV who have low-to-intermediate (<20%) 10-year ASCVD risk estimates

- Age 40-75 years
 - When 10-year ASCVD risk estimates are 5% to <20%, initiate at least moderate-intensity statin therapy (A1)
 - When 10-year ASCVD risk estimates are <5%, initiate at least moderate-intensity statin therapy (C1). The absolute benefit from statin therapy is modest in this population; therefore, the decision to initiate a statin should take into account the presence or absence of HIV-related factors that can increase ASCVD risk.
- Age <40 years
 - Data are insufficient to recommend for or against statin therapy

New Heart Disease Risk Calculator- PREVENT

- Sex*
 - Age*
 - Total cholesterol*
 - HDL cholesterol*
 - Systolic blood pressure*
 - BMI
 - eGFR
 - Diabetes*
 - Current smoking*
 - Anti-hypertensive medication*
 - Lipid-lowering medication*
- Optional
- UACR
 - HbA1C
 - Zip Code (for estimating social deprivation index)

Key Takeaways of the AHA PREVENT Equations

1. Include a large, contemporary, and diverse sample of US adults for derivation and external validation
2. Predict the risk of total or global CVD as a composite of atherosclerotic cardiovascular disease and heart failure as well as for each CVD subtype separately
3. Broaden the outcome to include prediction of heart failure
4. Remove race from risk prediction acknowledging that race is a social construct and not a biological predictor
5. Lower the age to begin risk prediction as early as age 30 years and capture a greater proportion of the adult life course
6. Provide risk estimates for CVD over a 10-year and 30-year time span
7. Offer optional models that incorporate add-on measures of kidney and metabolic health when indicated given the growing burden of cardiovascular-kidney-metabolic (CKM) syndrome
8. Include a measure of place-based social disadvantage (social deprivation index [SDI]) to acknowledge the role of social determinants of health in cardiovascular disease risk

Also in PCE ASCVD risk calculator

Tips for Lowering your CVD Risk



- QUIT SMOKING!!
- Lifestyle modifications
- Know your numbers (and goals)
 - Blood Pressure (120/80 mm Hg)
 - Cholesterol
 - Hemoglobin A1C (7.0%)
 - ASCVD risk
- Take your meds (many come in combo pills)
 - ART
 - Antihypertensives
 - Statins
 - Anti-diabetes medications

Age-appropriate Cancer Screenings

Cervix/anus

Breast

Colon

Lung

HPV-related malignancies in women with HIV

Cervical cancer: 3-4x
risk

Anal cancer: 2.5x risk

Vaccine is available for
prevention!

- Everyone ages 9-26 (target age 11-12)
- Some up to age 45

Cervical cancer screening guidelines for women with HIV



Goal of screening: cancer prevention through removal of precancerous lesions

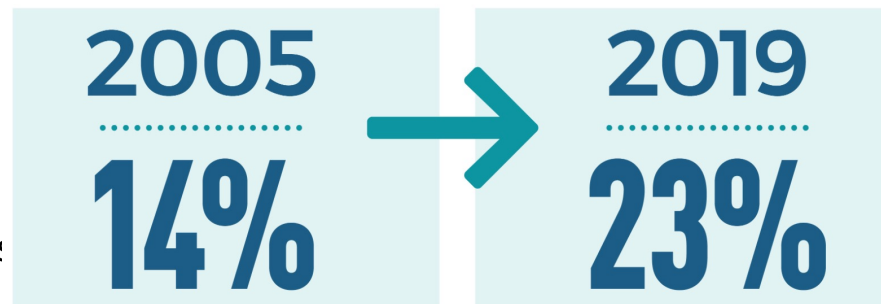
- Age <30 years
 - Start screening at age 21 or insertional sexual activity, whichever is later
 - Screen at time of HIV diagnosis
 - Screen with a pap test only
 - Annually x3 years, then every 3 years

PERCENTAGE OF WOMEN

OVERDUE FOR

CERVICAL CANCER SCREENINGS

- Age ≥30 years
 - Screen at time of HIV diagnosis
 - Screen with a pap test only testing
 - If initial pap + HPV co-test is negative, then HPV-based testing every 3 years (not every 5 years)
 - Screening should continue throughout life (not stop at age 65)

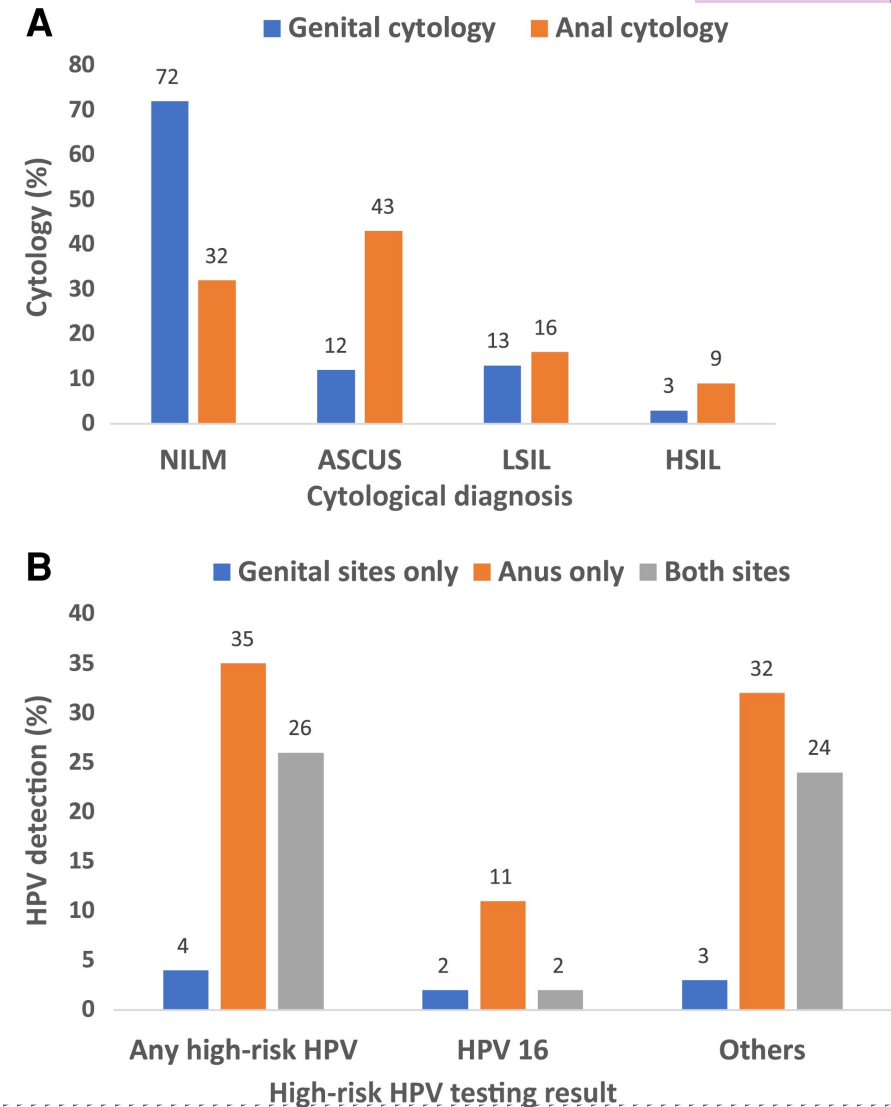


Source: Suk R, et al. doi:10.1001/jamanetworkopen.2021.43582

high-grade cervical disease within the
HPV-based testing x3 years, then HPV-
testing every 3 years
high-grade cervical disease within the
ear screening recommended

Anal cancer screening in women with HIV

- Anal HPV prevalence is high in women with HIV, even among those without a history of receptive anal intercourse
- Cervical HPV predicts anal HPV; both predict anal precancerous lesions
- Anal HPV types frequently differ from cervical HPV types
- Risk factors include:
 - Age ≥ 35 years
 - History of receptive anal intercourse
 - History of high-grade cervical disease
 - Presence of genital warts



Lahiri CD et al. *Clin Infect Dis.* 2020;70(6):1121-1128

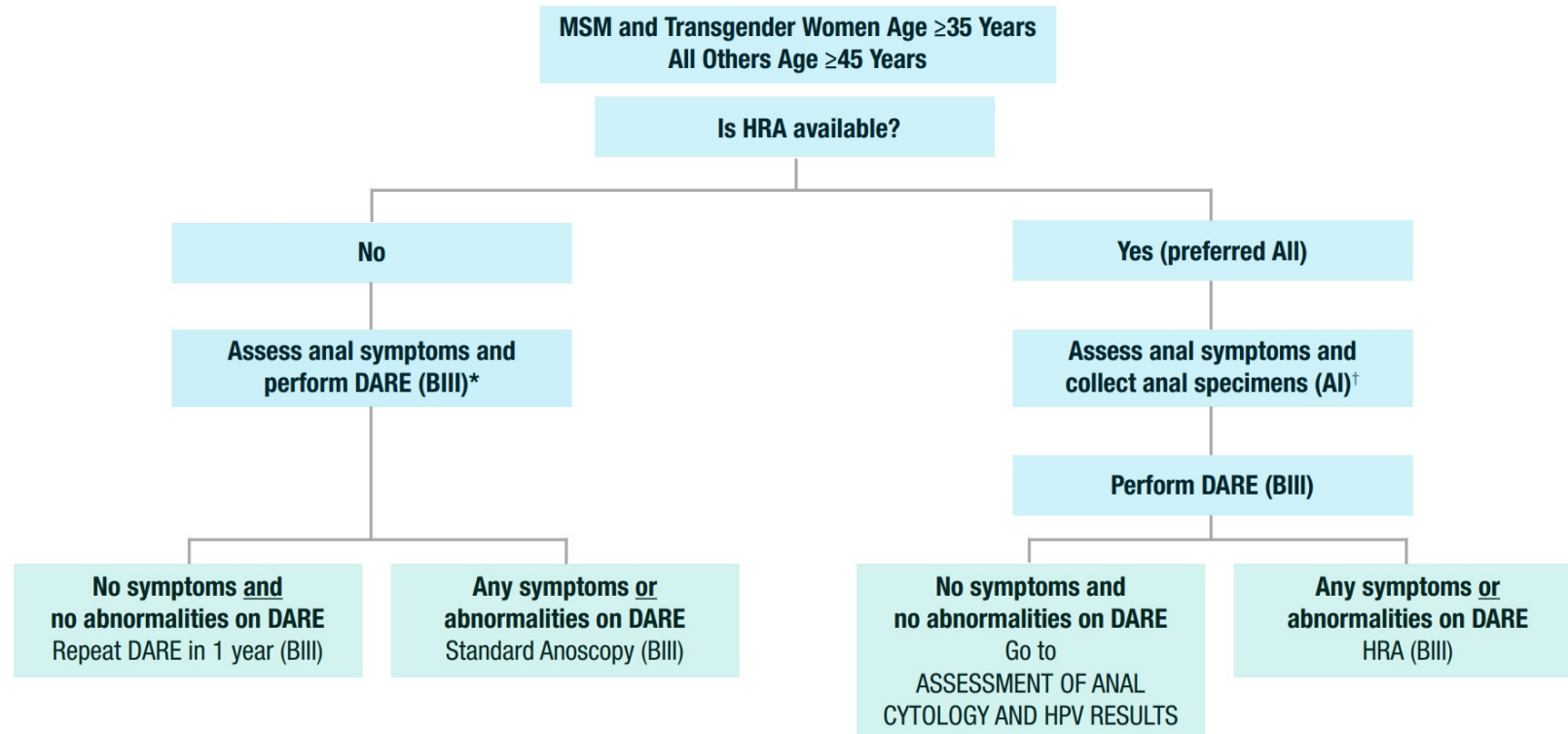
Liu Y et al. *J Infect Dis.* 2023;227(8):932-938

Hirsch BE et al. Screening for Anal Dysplasia and Cancer in Adults With HIV. NYSDOH AI Baltimore (MD): Johns Hopkins University. 2022

Thompson MA et al. *Clin Infect Dis.* 2021;73(11):e3572-e3605

Anal cancer screening guidelines

SCREENING ALGORITHM FOR ANAL CANCER IN ASYMPTOMATIC PEOPLE WITH HIV



* No specimens collected

† Collect any specimens either for cytology or for cytology with HPV co-testing prior to DARE. HPV testing without cytology is not recommended (BIII)

Key: DARE = digital anorectal exam; HPV = human papillomavirus; hr-HPV = high-risk HPV; HRA = high-resolution anoscopy; MSM = men who have sex with men

Breast cancer screening guidelines



Goal of screening: to detect cancer early for curative treatment

ACOG

- Can start at age 40, no later than age 50
- Mammogram either annual or every other year
- Continue until age 75, shared decision making after age 75

ACS

- Age 40-45: option for annual mammogram
- Age 45-54: annual mammogram
- Age 55+: can switch to every other year
- Continue screening as long as in good health and expected to live at least 10 years

USPSTF

- Start at age 40 *updated in 2023
- Mammograms every other year until age 74
- Not enough data for age 75+ recommendation

<https://www.cancer.org/cancer/types/breast-cancer/screening-tests-and-early-detection/american-cancer-society-recommendations-for-the-early-detection-of-breast-cancer.html>

<https://www.acog.org/clinical/clinical-guidance/practice-bulletin/articles/2017/07/breast-cancer-risk-assessment-and-screening-in-average-risk-women>

<https://www.bcrf.org/blog/uspstf-new-breast-cancer-screening-guidelines-2023/>

Colon cancer screening guidelines



Goal of screening: removal of precancerous polyps or early cancer detection

Age recommendations

- Age 45*: start screening
- Age 45-75: continue screening as long as in good health with a 10-year life expectancy
- Age 76-85: shared decision making between patient-provider
- Age 85+ no screening

Screening modalities

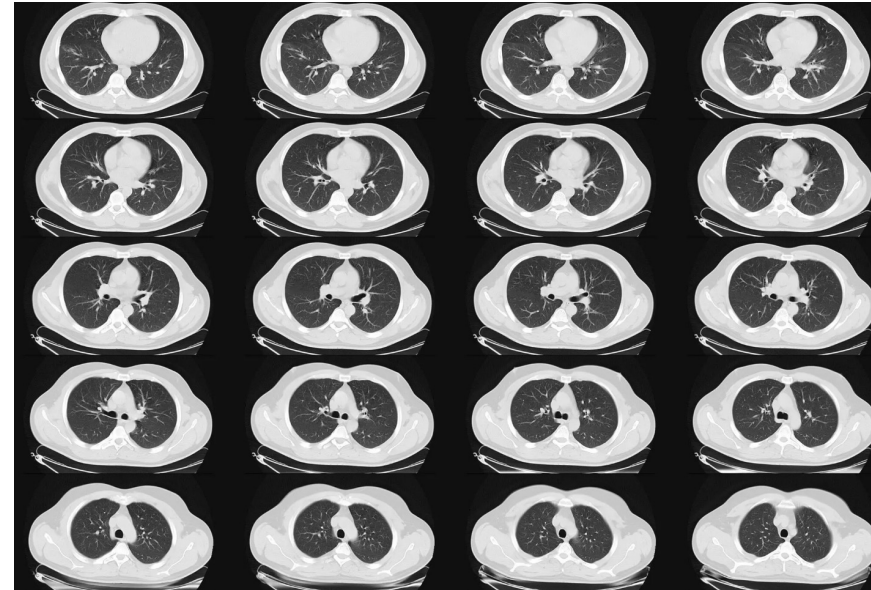
- Stool-based test every 1-3 years
- Visual exams
 - Sigmoidoscopy every 5 years
 - CT colonoscopy every 5 years
 - Colonoscopy every 10 years

Lung cancer screening guidelines



Goal of screening: early cancer detection

- Who (updated 2021):
 - Age 50-80
 - 20 pack-year smoking history
 - Currently smoke or quit ≤ 15 years ago
- What:
 - Low-dose lung CT scan
- How often:
 - Every year
 - Stop after you have stopped smoking for >15 years or limited life expectancy



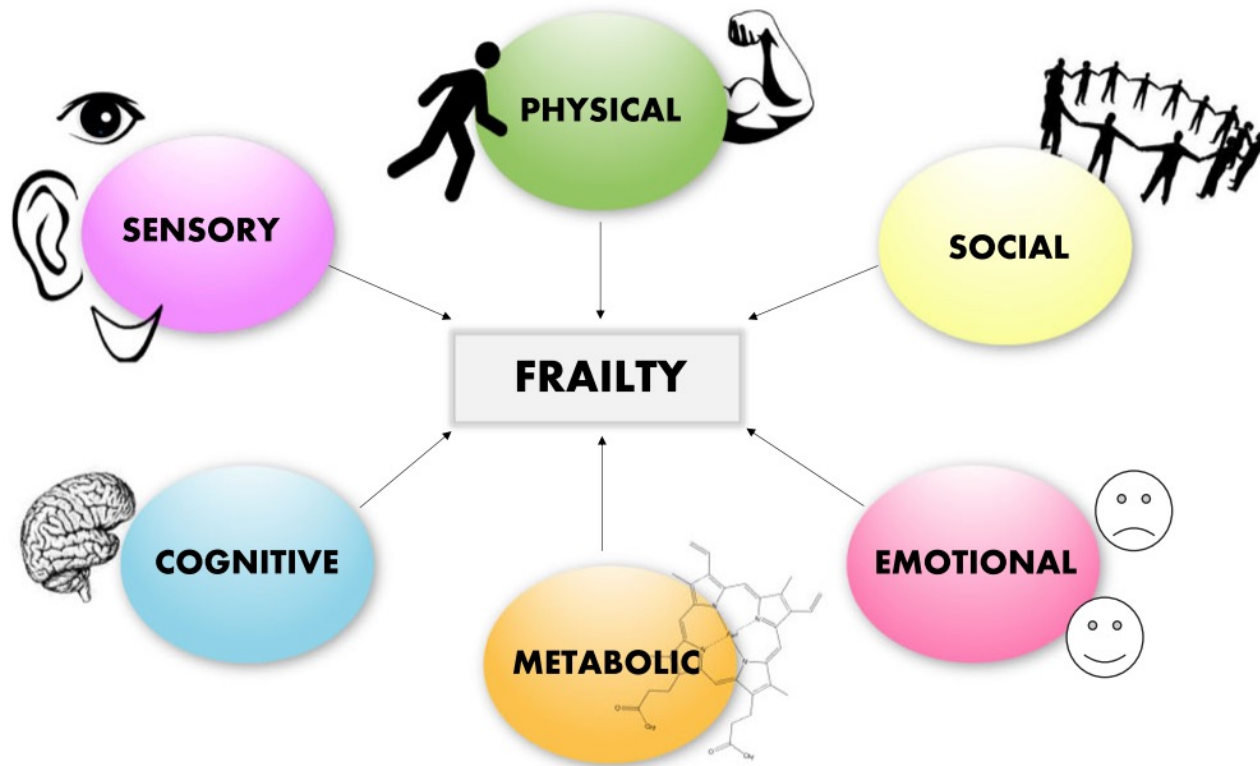
Frailty in Women with HIV

Frailty
Cognitive Decline

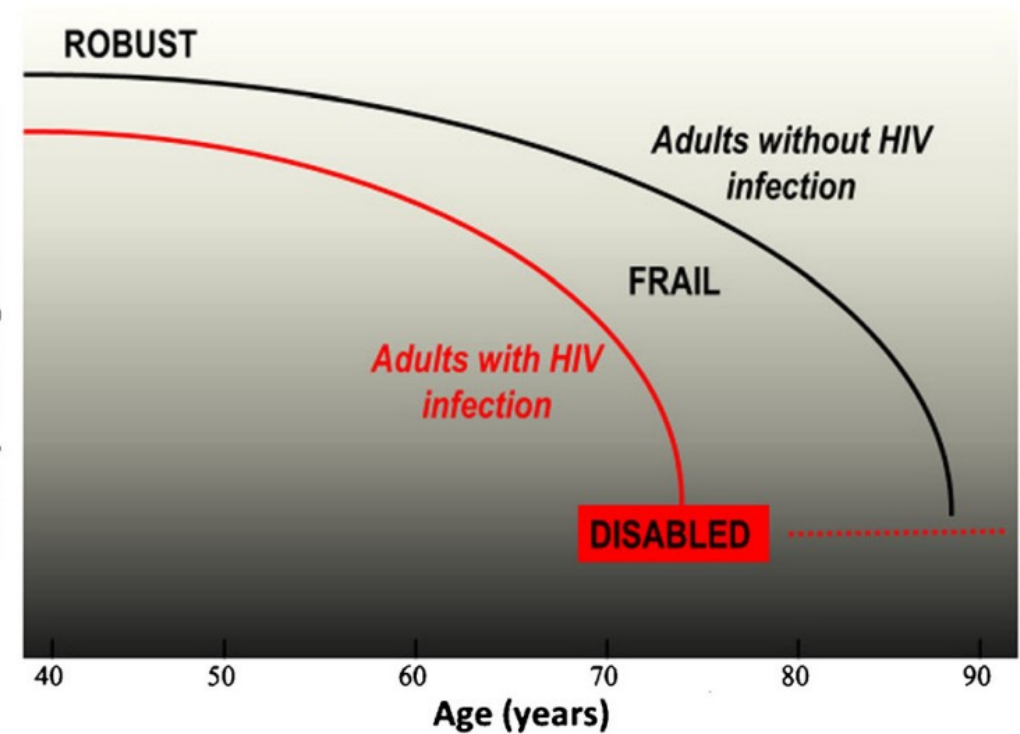


Frailty

Frailty is a vulnerability state characterized by impairments and limitations that might lead to disability



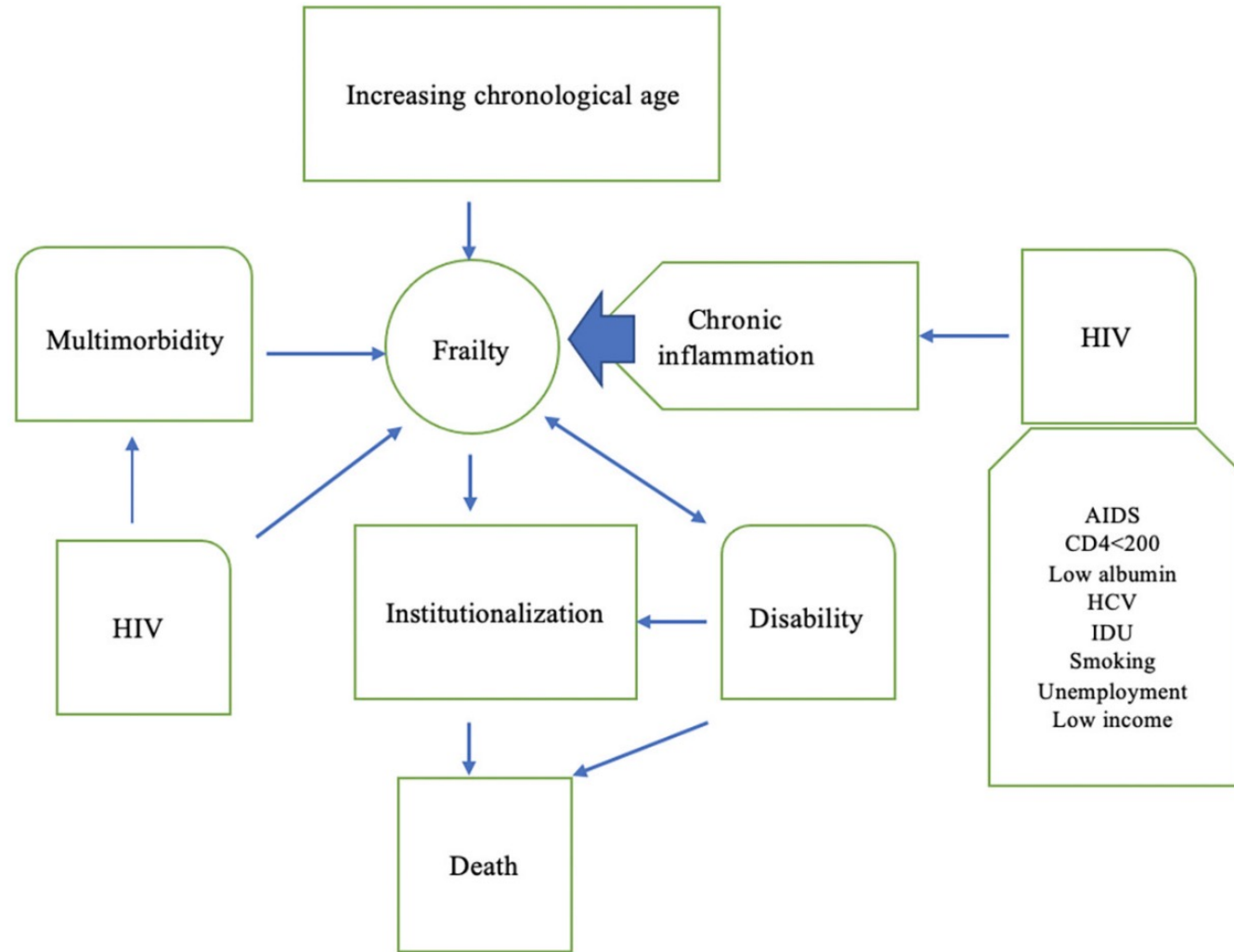
Physical, social, emotional, metabolic, sensory and cognitive health



Fried Frailty Phenotype (at least 3):

- Unintentional weight loss (at least 4.5 kg or $\geq 5\%$ of body weight in 1 year)
 - Self-reported exhaustion (effort required for activity)
 - Weakness (grip strength)
 - Slow walking speed (distance covered over 4 minutes)
 - Low physical activity
-
- Prefrailty: 1 or 2

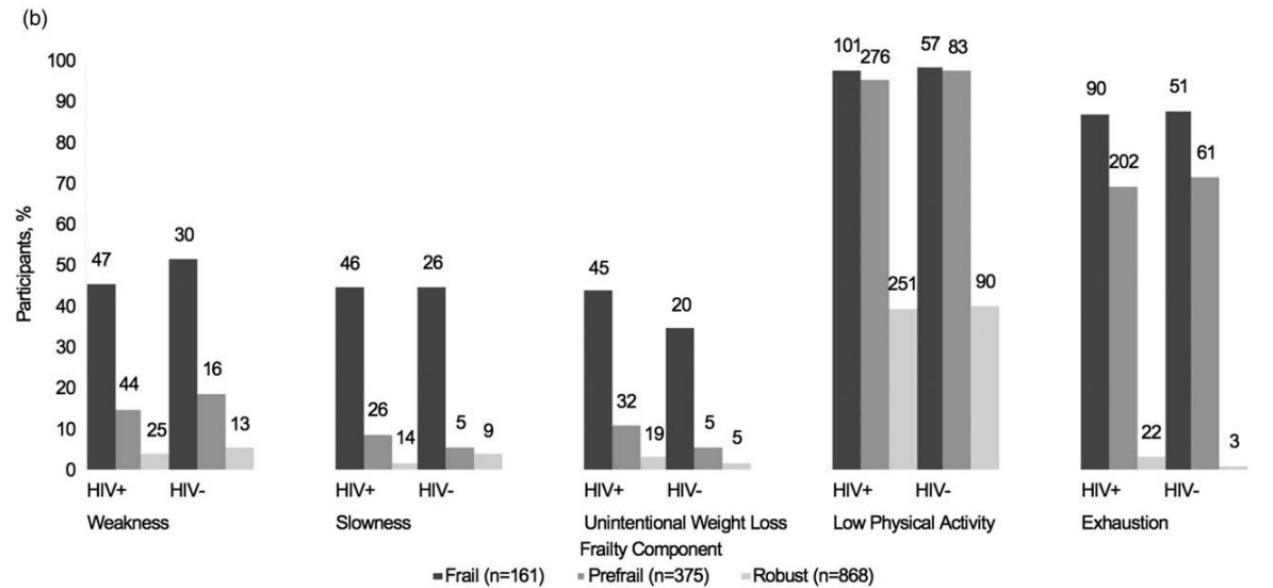
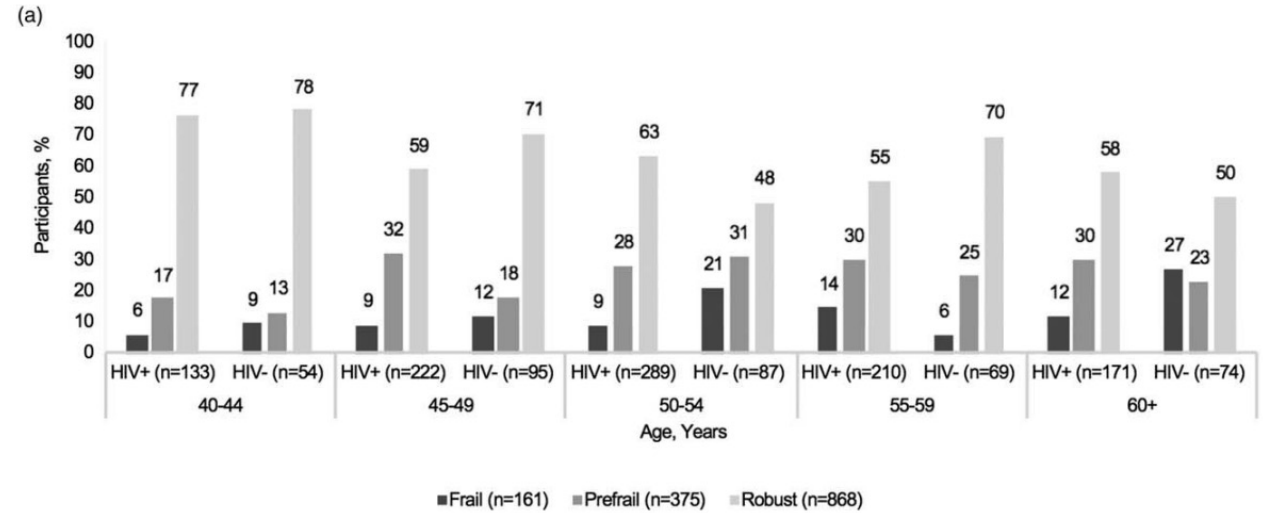
Frailty in people with HIV is multifactorial



Risk factors for frailty among people living with HIV

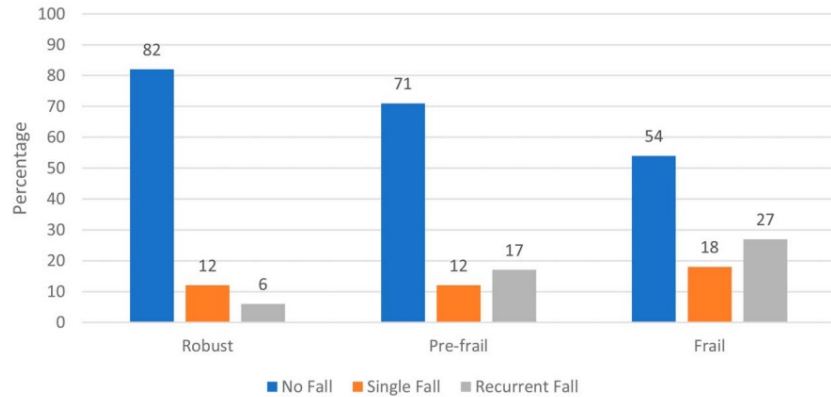
- Comorbidities
 - Cardiovascular disease
 - Diabetes
 - Depression
 - Obesity
- Polypharmacy
- Detectable HIV viral load
- ART side effects (bone mineral density loss)

Frailty is common in middle-aged women with and without HIV in the WIHS

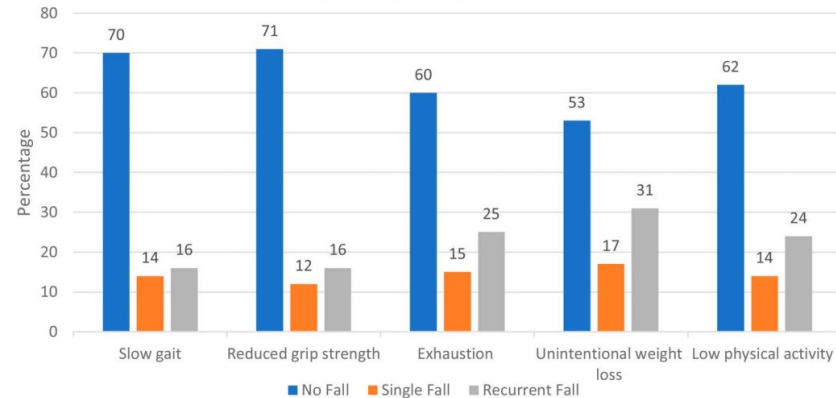


Frailty is associated with frequent falls and mortality

Proportion of WIHS Participants with Single and Recurrent Falls by Frailty Status

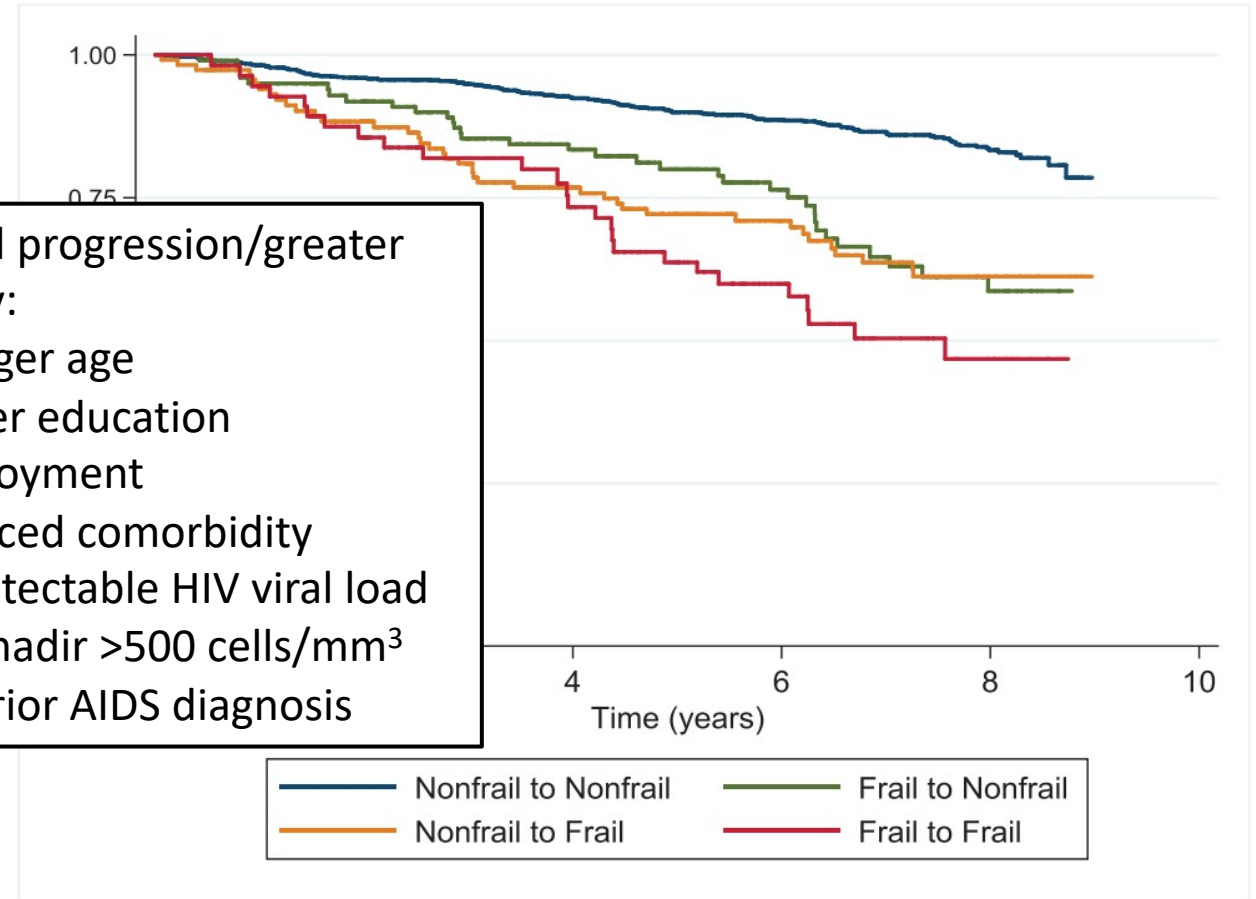


Proportion of WIHS Participants with Single and Recurrent Falls by Frailty Component Status

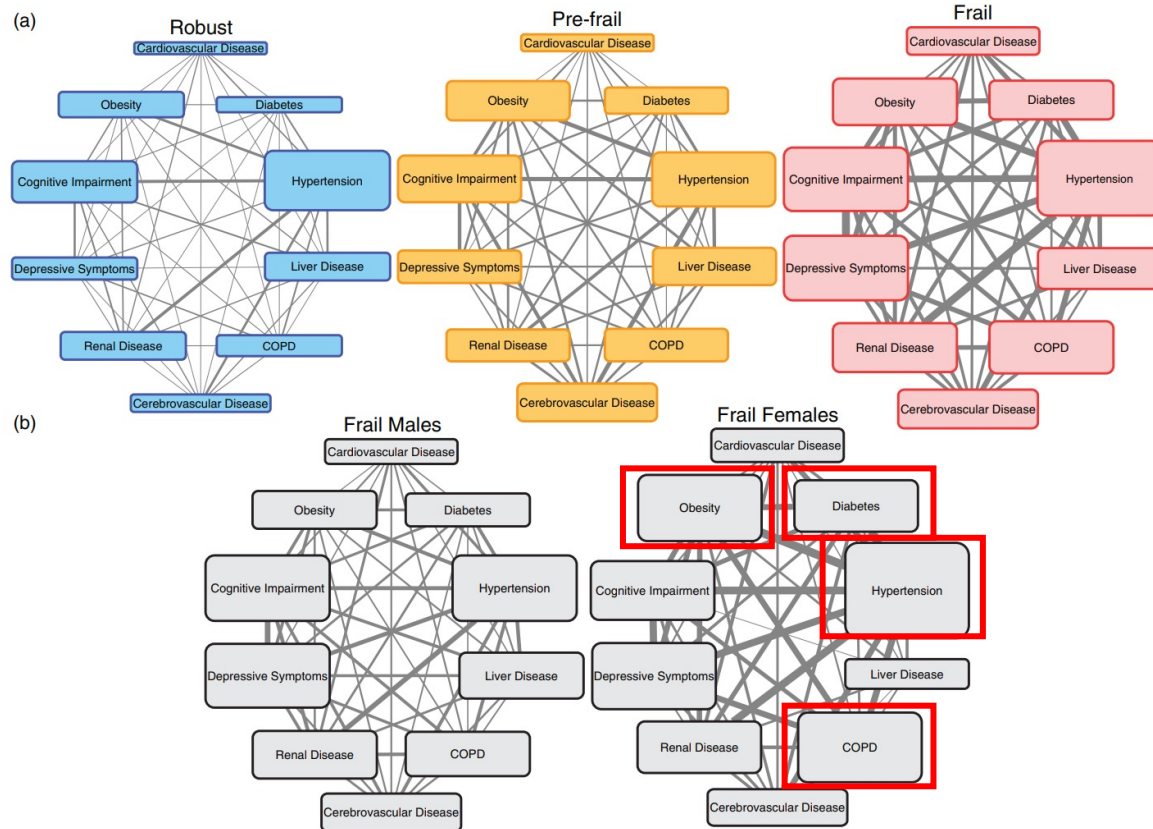


Reduced progression/greater recovery:

- Younger age
- Higher education
- Employment
- Reduced comorbidity
- Undetectable HIV viral load
- CD4 nadir >500 cells/mm³
- No prior AIDS diagnosis



Women with HIV and frailty have a high number of comorbidities



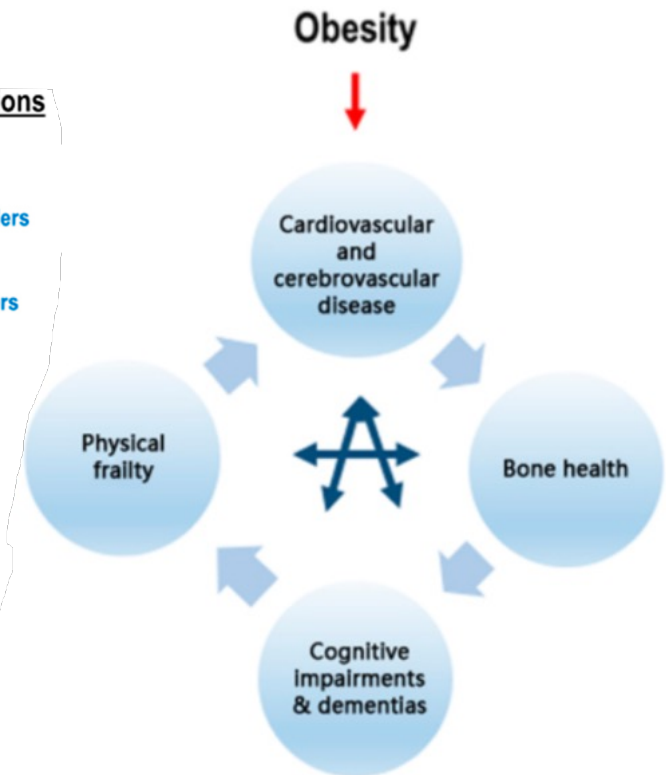
Multiple Targets & Interventions

Targets

- Clinical
 - Diagnoses – symptoms, disorders
 - Individual or clusters
- Change
- Peripheral & central fluid biomarkers
- Organ-specific events

Interventions

- Pharmaceutical
 - ART type
 - PrEP
 - Fit for purpose
 - Repurposed
- Lifestyle
 - Diet
 - Exercise
 - Intellectual activities
 - Reduce stigma
 - Reduce disparities



Bone disease is common in people with HIV, especially postmenopausal women

Types of bone disease

- Osteoarthritis/avascular necrosis – younger age for joint replacements
- Osteoporosis/fracture (2-4x risk)

Risk factors for osteoporosis

- ART
 - loss of 2-6% bone mineral density with ART start
 - Ongoing loss with TDF, some PIs
- BMI
- Vitamin D deficiency
- Female sex
- Alcohol use

Screening for osteoporosis

- FRAX
 - Women: all premenopausal ≥ 40
 - Men: age 40-49
- DEXA
 - Women: all postmenopausal women
 - Men: all men ≥ 50 years



Polypharmacy is very common in people with HIV and increases with age

- ≥ 5 meds: up to 91%; ≥ 10 meds: up to 30%
- Associated with:
 - Lower ART adherence
 - Frailty
 - Adverse drug reactions
 - Hospitalization
 - Neurocognitive impairment
 - Falls, fracture
- Common drug-drug interactions between ART and non-ART:
 - Cardiovascular meds (statins, antithrombotic agents)
 - CNS meds (antidepressants, antianxiety meds)
 - Proton-pump inhibitors
 - Corticosteroids
 - Divalent cations (iron, calcium, magnesium)
 - Antidiabetics
 - Bronchodilators
 - Dietary supplements

Olivieri-Mui B et al. *AIDS Patient Care STDS*. 2022;36(6):226-235

Sung M et al. *AIDS Care*. 2021;33(11):1492-1499

Justice AC et al. *Lancet Healthy Longev*. 2021;2(10):e639-e650

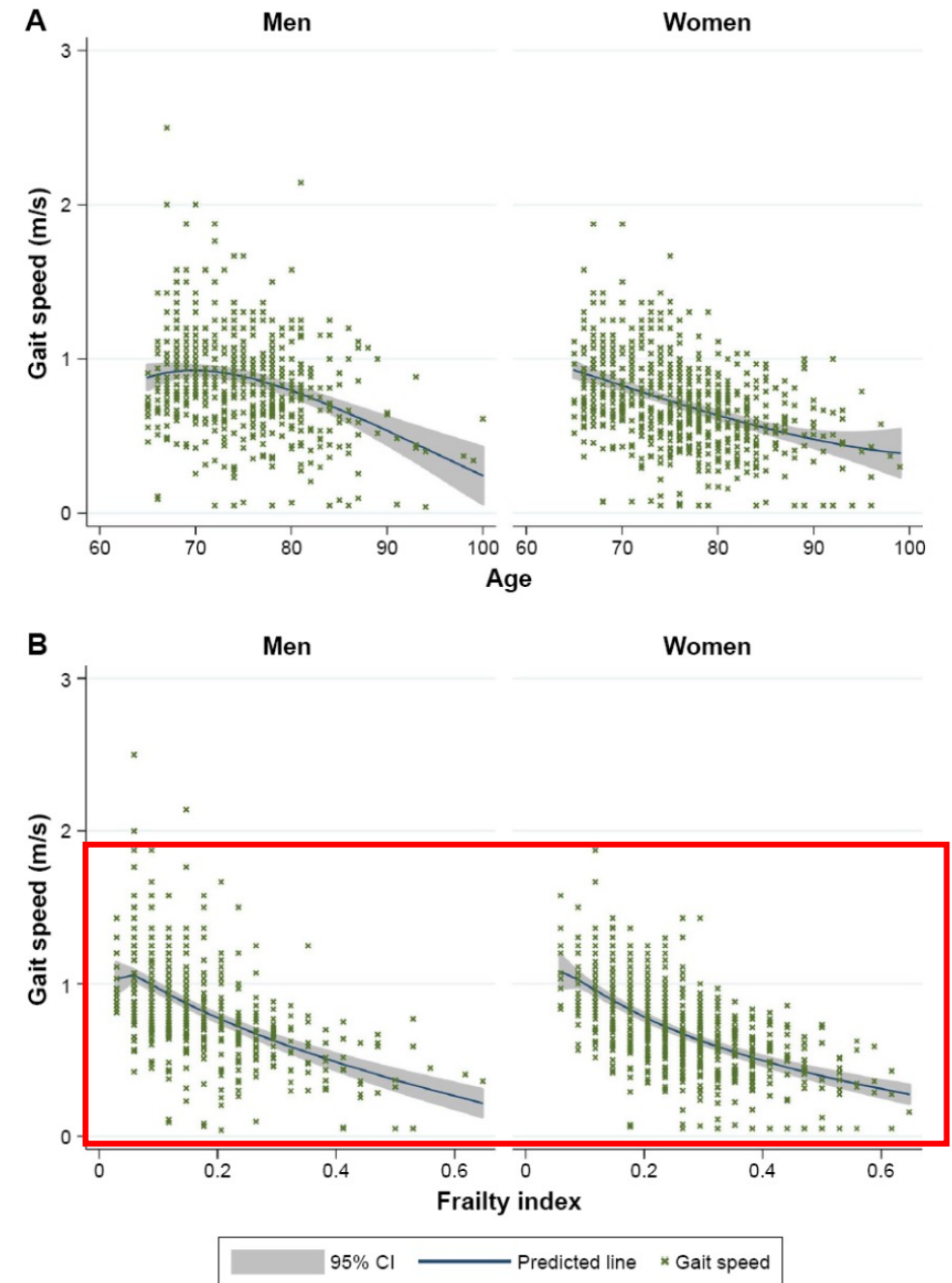
Marin S et al. *AIDS Rev*. 2023;25(1):27-40

Assessing for frailty is recommended at age ≥ 50 by EACS

- FRAIL Scale
- Clinical Frailty Scale
- Gait Speed

FRAIL Scale
F atigue
R esistance (ability to climb one flight of stairs)
A mbulation (ability to walk one block)
I llnesses (Greater than 5)
L oss of Weight ($\geq 5\%$ over 1 year)
≥ 3 = frail / 1 - 2 = pre-frail / 0 = robust

Reference: Woo, Jean, Jason Leung, and John E. Morley. "Comparison of frailty indicators based on clinical phenotype and the multiple deficit approach in predicting mortality and physical limitation." *Journal of the American Geriatrics Society* 60.8 (2012): 1478-1486.





Tips for preventing/limiting frailty

- Physical exercise
 - Walking
 - Light strength training
- Good nutrition
- Social engagement
- Keep your mind active
- ART and management of co-infections
- Management of comorbidities
- Management of polypharmacy

A wooden surface with various colorful geometric blocks (cubes, rectangular prisms) in shades of blue, green, red, yellow, cyan, purple, and pink. Three wooden pins (two dark, one light) are placed on the surface. The text "Cognitive decline" is overlaid in white.

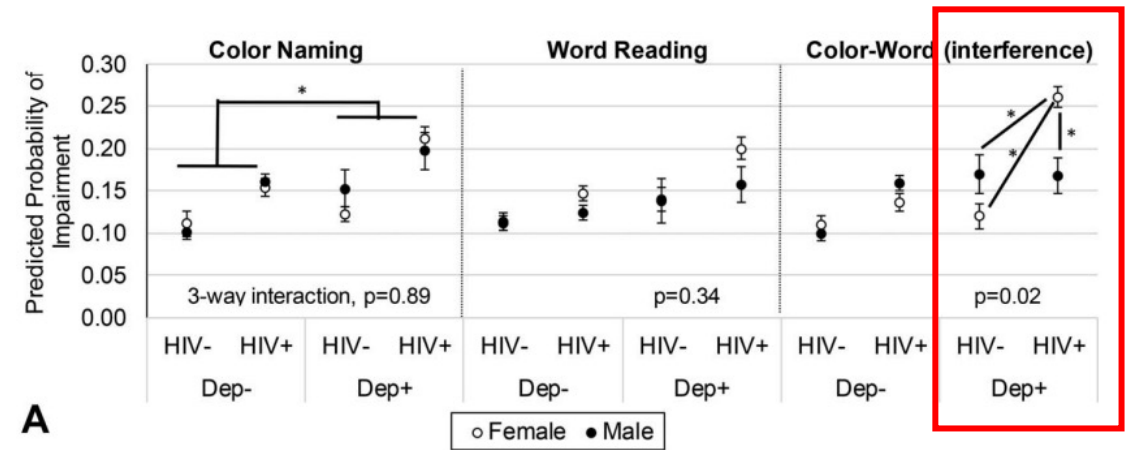
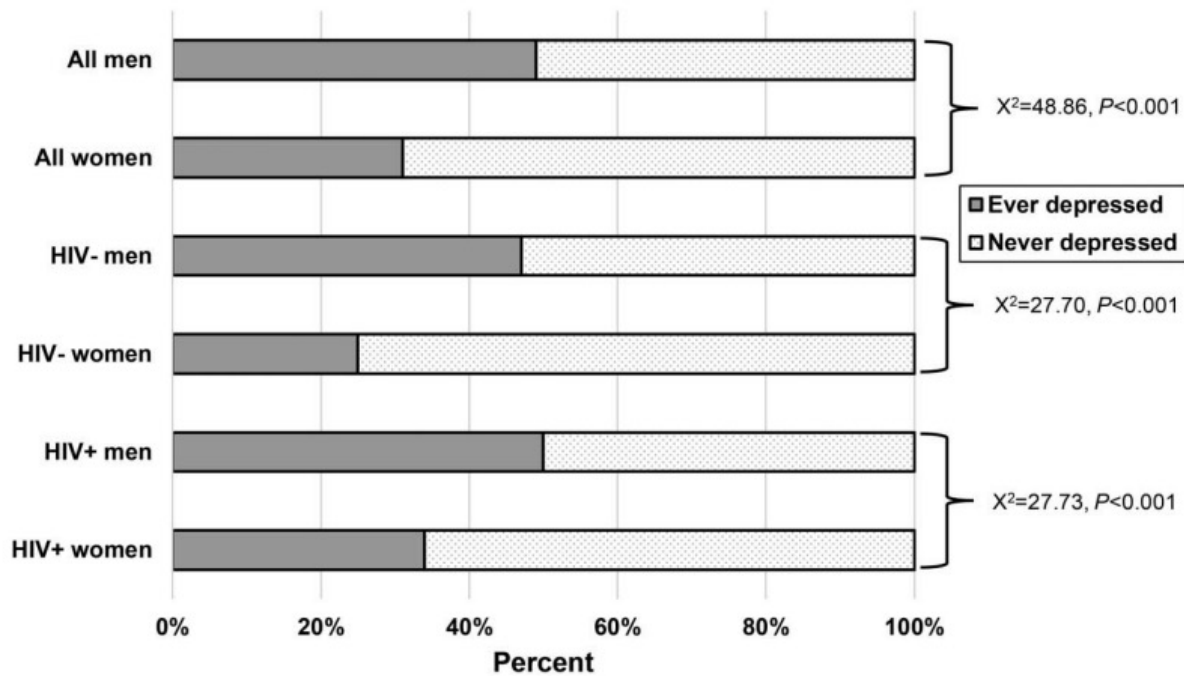
Cognitive decline



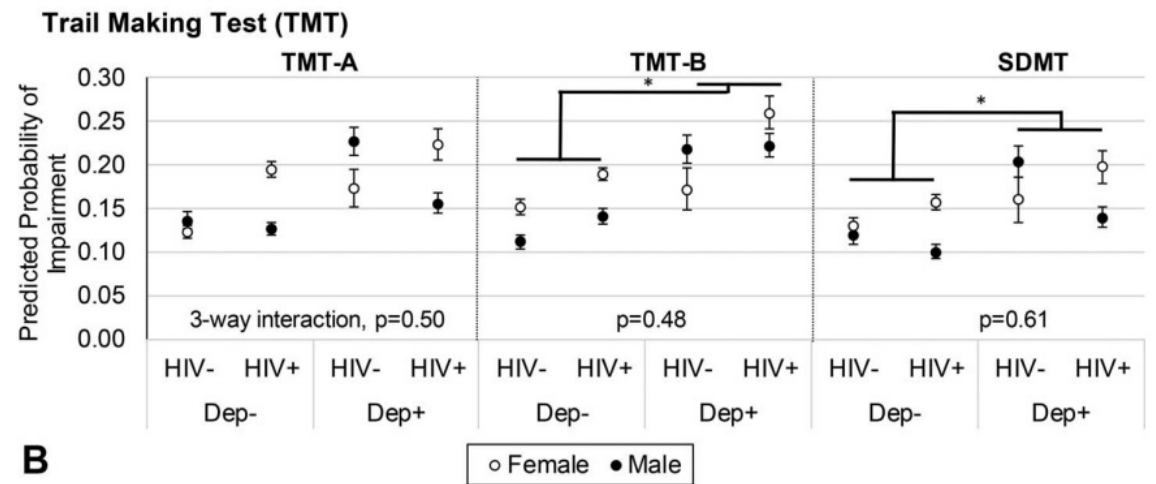
Cognitive impairment is common in older people with HIV

- HIV-associated neurocognitive disorders (HAND)
 - More common in prior eras, ~45% prevalence
 - More stable, less degenerative than AD
- Alzheimer's Disease (AD)
 - Will likely become more common as the population ages
 - Little research in AD in people with HIV- cohorts may be too young
 - May be misdiagnosed as HAND
 - Risk factors: older age, vascular disorders, depression, genetics
- Vascular dementia
 - Cardiometabolic risk factors

Depressive symptoms are associated with executive dysfunction in women with HIV more than in men with HIV



A

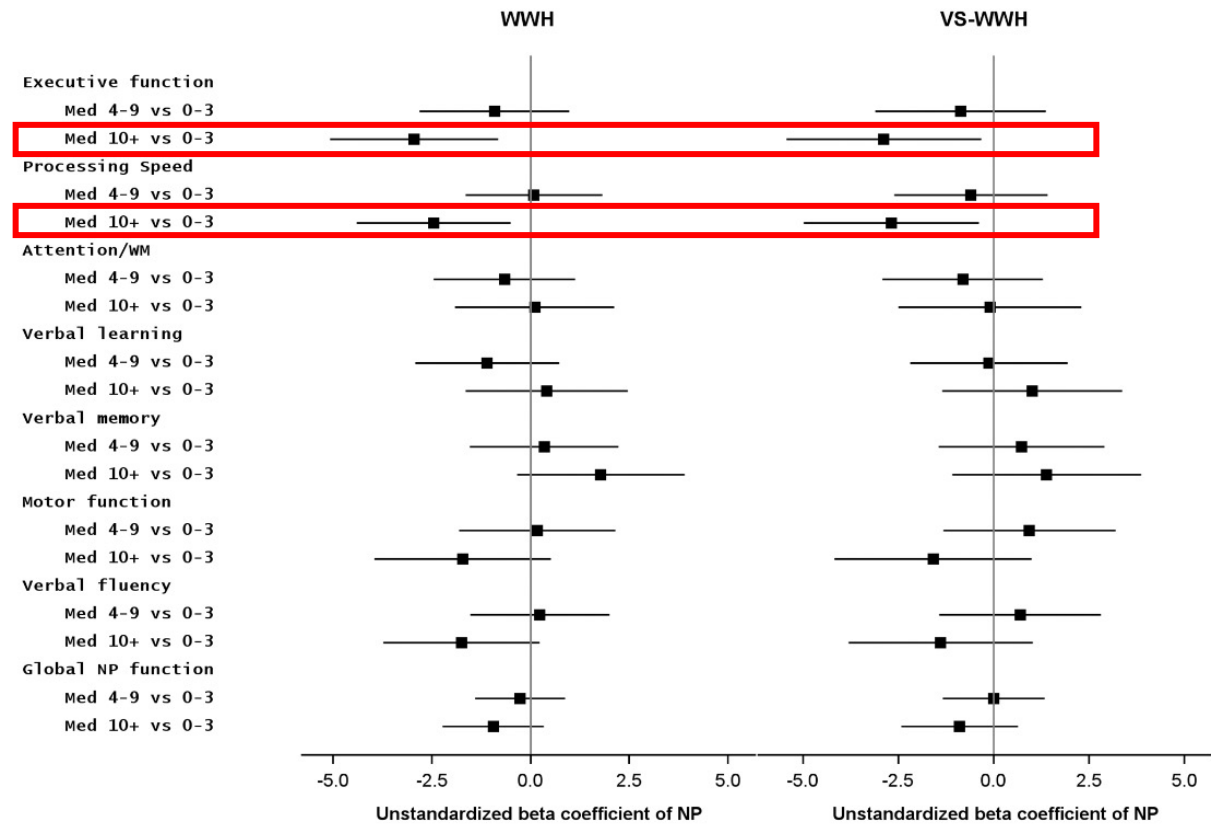


B

Medication use may impact neurocognitive impairment in women with HIV

- Women with HIV are on almost twice as many medications than age-matched women without HIV (7.5-8 vs. 3.5)
- Common non-antiretroviral medication classes can impact the central nervous system
 - Anticonvulsant
 - Antianxiety*
 - Anticholinergic
 - Antipsychotic
 - Amphetamine
 - Opioid*
 - Beta-blocker
 - Gastrointestinal*
 - Antihistamine*
 - Muscle relaxant
 - Antidepressant*

*More common in women with HIV



34.5% with moderate (5-9 meds) polypharmacy
 24% with severe (≥ 10 meds) polypharmacy

Spence AB et al. *AIDS Res Hum Retroviruses*. 2022;38(7):561-570.
 Radtke KK et al. *J Acquir Immune Defic Syndr*. 2018;78(2):202-208
 Rubin LH et al. *AIDS Res Hum Retrovirus*. 2022;38(7):571-5790

Many dementia risk factors are modifiable

- Less education/cognitive stimulation
- Vision loss
- Hearing loss
- Head injury
- Smoking
- Excessive alcohol consumption
- Physical inactivity
- Infrequent social contact
- Air pollution
- High LDL cholesterol
- Hypertension
- Obesity
- Diabetes
- Depression

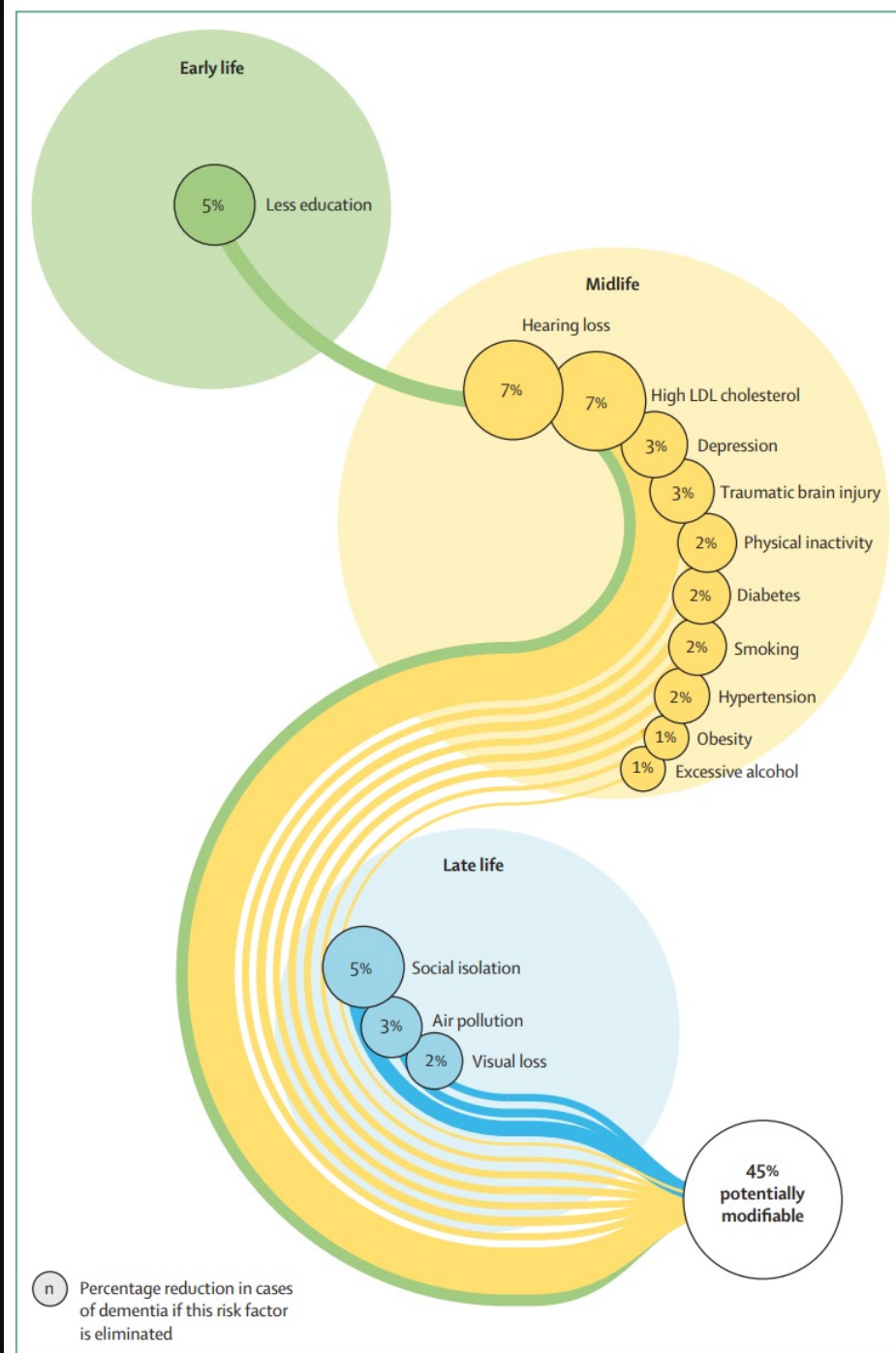


Figure 9: Population attributable fraction of potentially modifiable risk factors for dementia

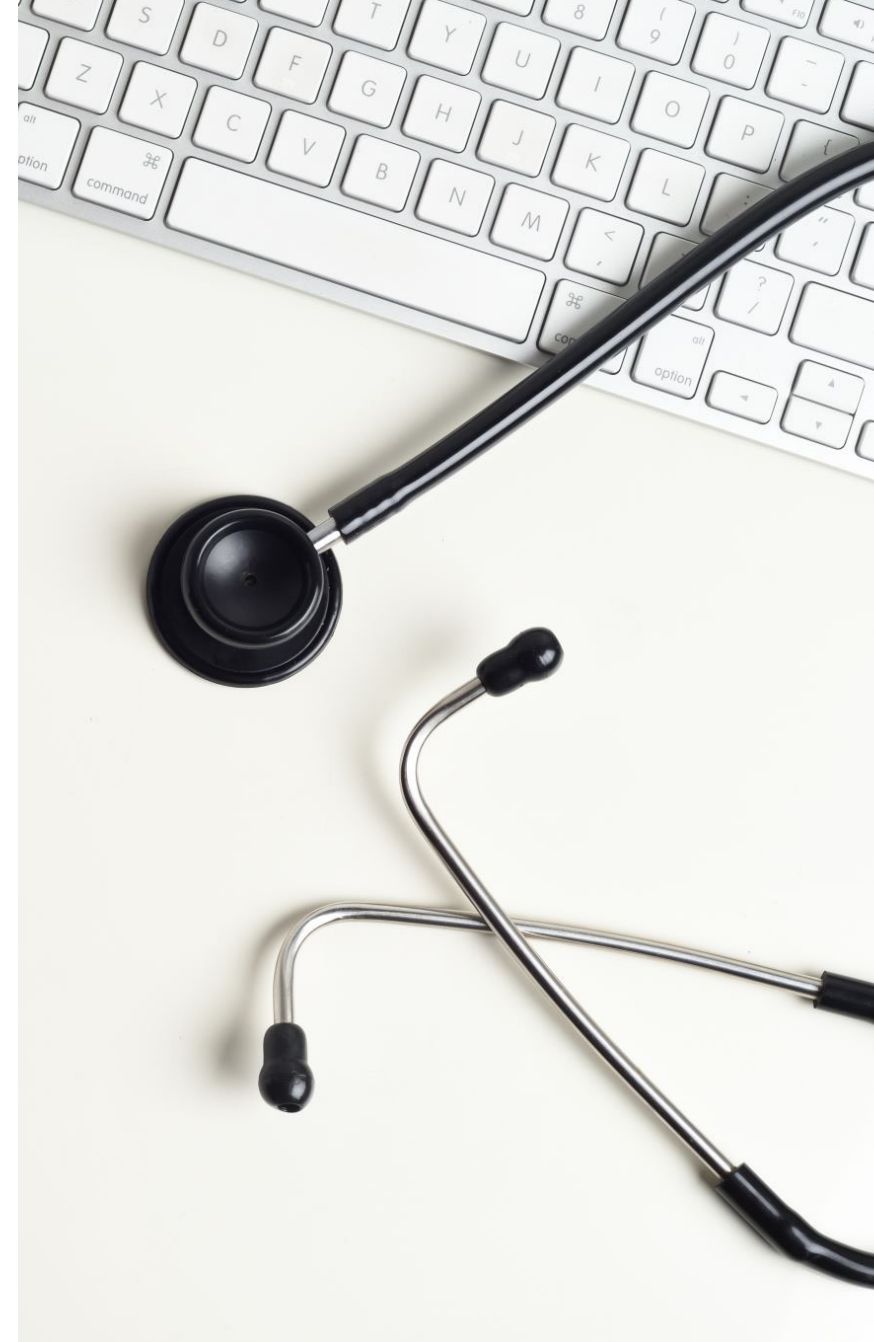


Approach to cognitive decline in women with HIV

- In-office assessments: MMSE, MOCA
- Screen and treat for depression, substance use, or other underlying health conditions
- Assess for polypharmacy, eliminate (or reduce) any CNS-active medication if possible
- Rule-out other causes of cognitive decline (syphilis, thyroid disease, nutritional deficiency)
- Consider CNS imaging
- Consider formal neuropsychiatric evaluation if available

How to Make the Most Out of Your Visit with your Healthcare Provider

- Bring a list of questions/topics with you
 - Not all topics may be covered in every visit: may need to plan a follow-up visit
- Bring your numbers
 - Blood pressure
 - Blood sugar
- Bring your medications
 - Hot tip: most providers don't know what the medications they prescribe actually look like!
 - Ask if some meds can be combined. Combo pills exist outside of HIV meds.
 - Ask if any medications can be stopped.
- Bring a friend/family member
- Ask Questions!!



Thank you!!

- Study participants
- Funding sources
- Colleagues and mentors



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Questions?

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