

Models of Care for an Aging Population Living with HIV

Kathleen Fitch, MSN, FNP
Massachusetts General Hospital

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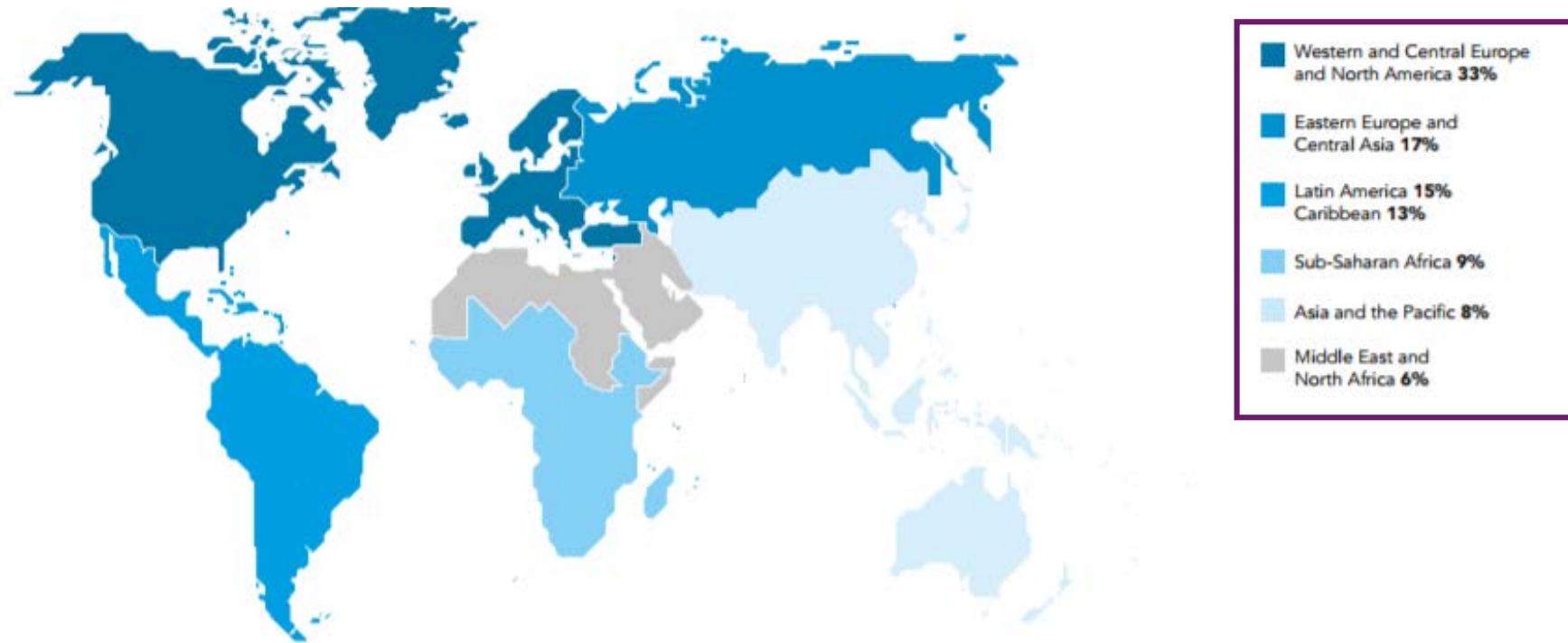
I have no conflicts of interest to report

Objectives

- Understand the worldwide demographic trends of the aging population living with HIV
- Describe common comorbidities and aging syndromes prevalent in the aging HIV population
- Compare appropriate care models for an aging HIV population
- Examine care provider roles for individuals aging with HIV

Population with HIV is Aging Worldwide

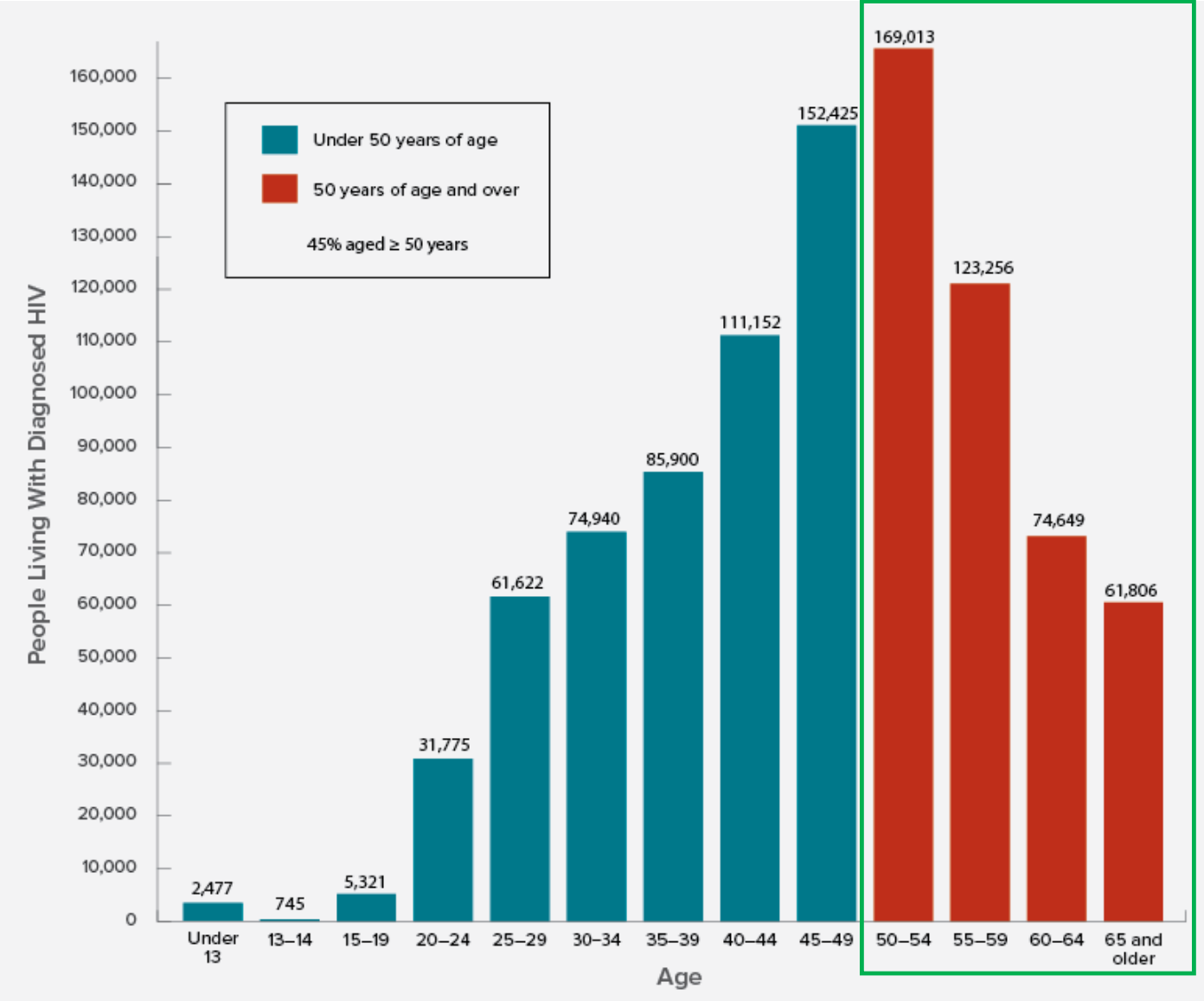
Estimated percentage of the adult population living with HIV age 50 years and over, by region, 2012.



Source: UNAIDS.

- **10%** of the adult population with HIV in **low- and middle-income** countries are ≥ 50 yrs
- **30%** of the adult population with HIV in **high income** countries are ≥ 50 yrs
- Since ~ 2007 , the proportion of adults living with HIV ≥ 50 yrs has increased in all regions, and especially in high income countries where treatment is readily available

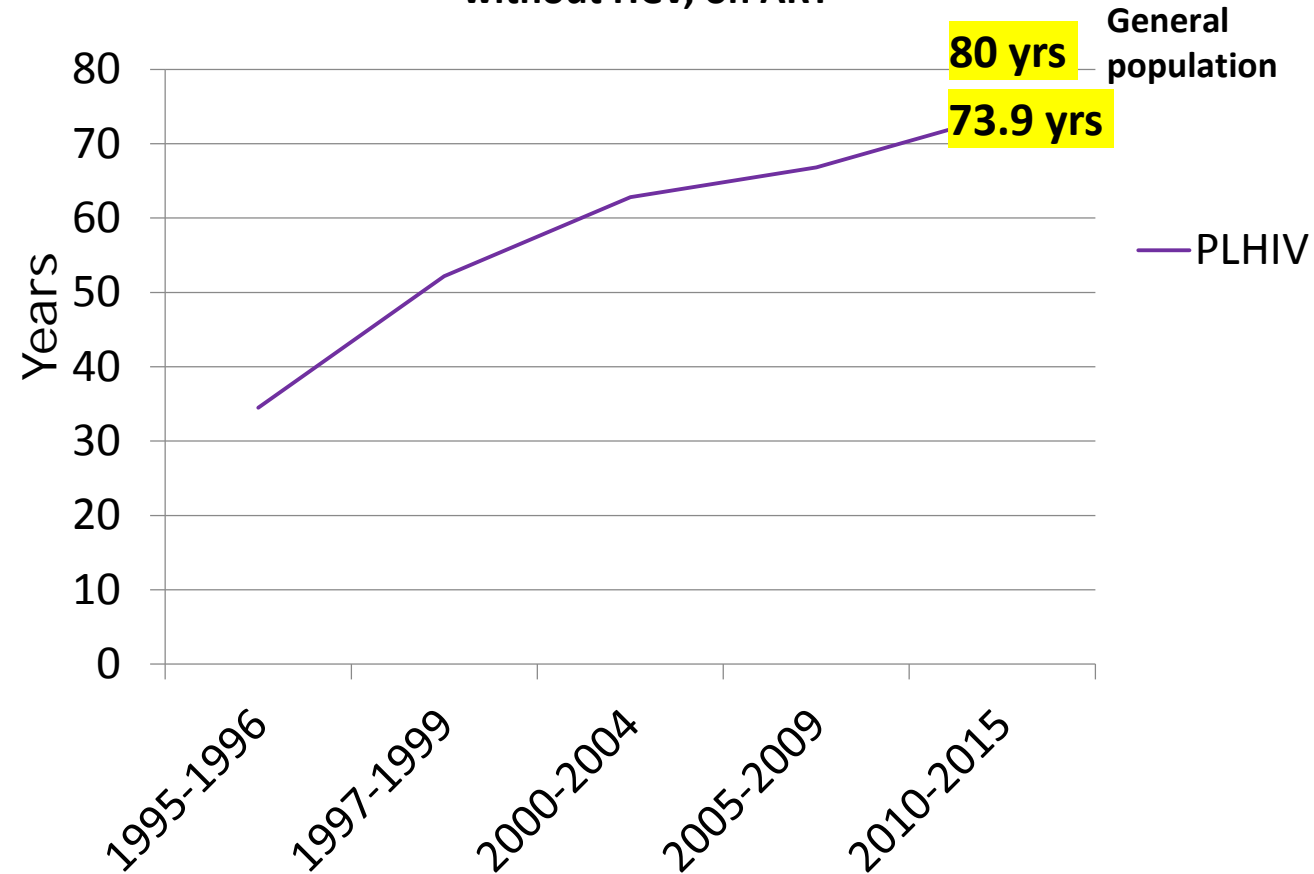
In the US ~50% of people with HIV are over the age of 50



Survival is Increasing for Individuals with HIV

Median life expectancy for individual with HIV at age 25,
without HCV, on ART

Danish HIV Cohort Study:
5,701 persons with HIV
28,505 matched controls
60,270 PY of observation for PLHIV

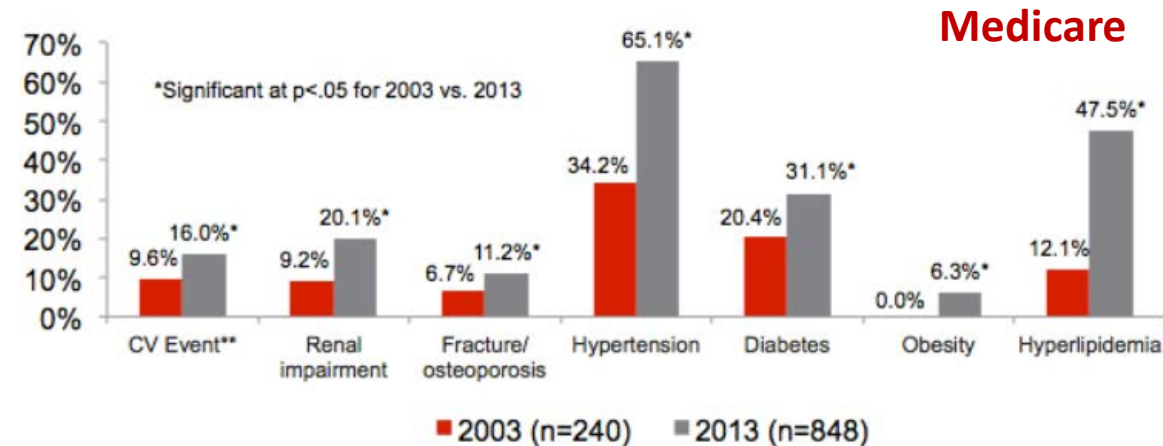
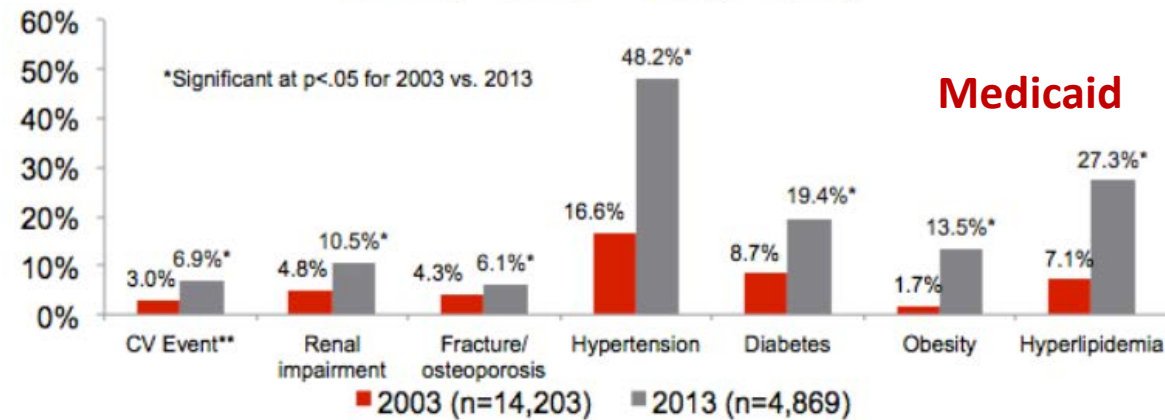
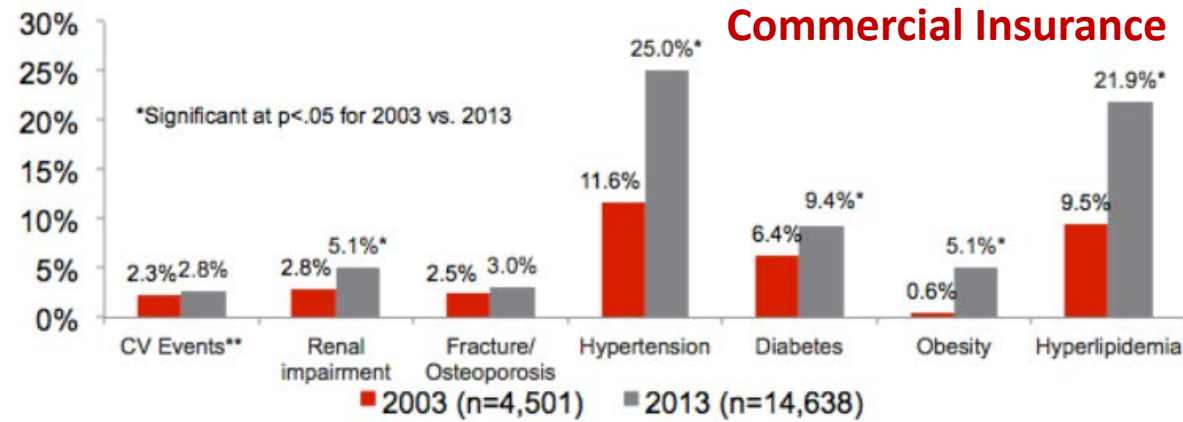


Factors Behind the Trend

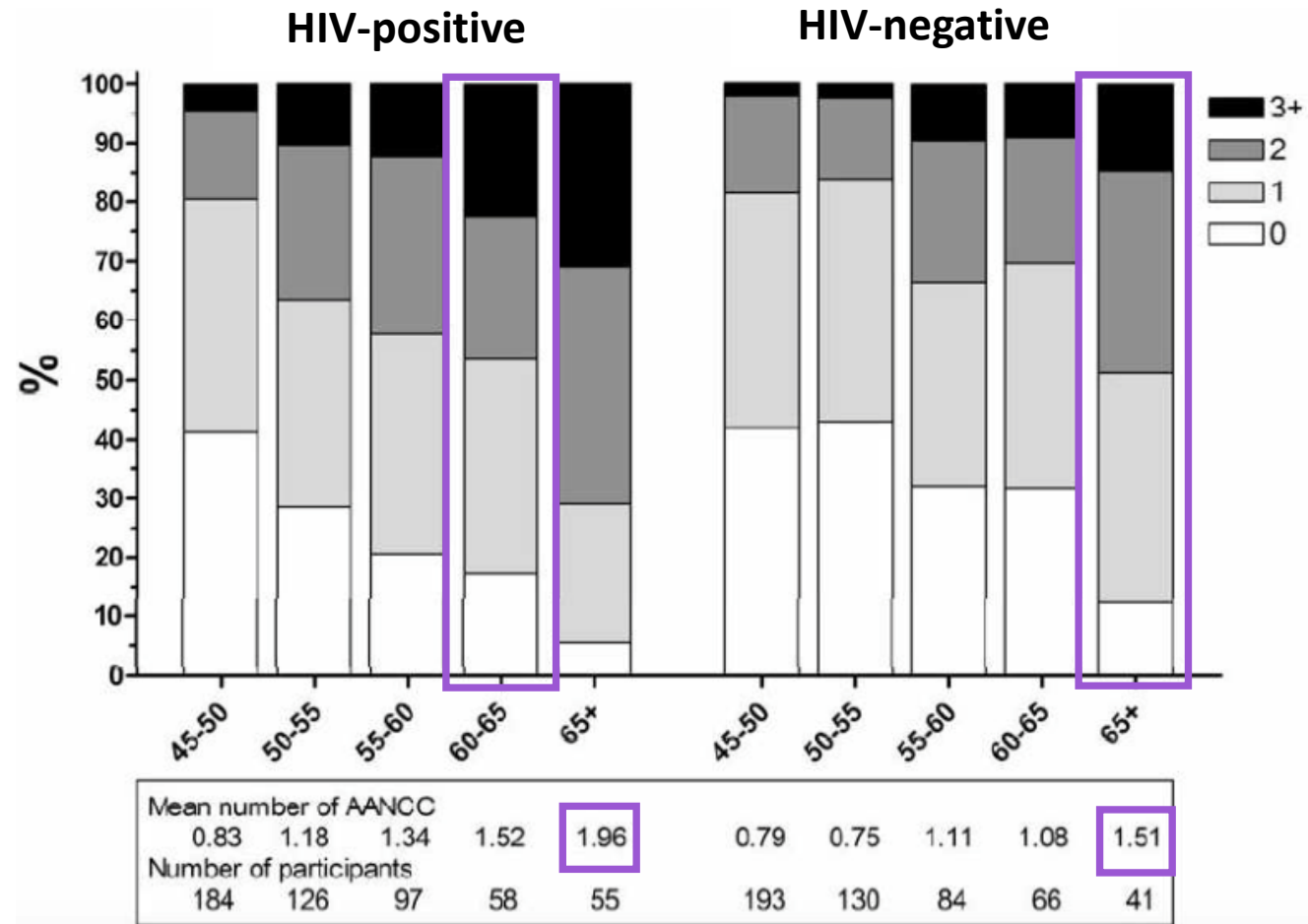
- Introduction of *effective* combination antiretroviral therapy (ART) approximately 20 years ago
- Morbidity and mortality related to opportunistic infections and other AIDS-related conditions has decreased
- New infections among persons older than 50
 - In 2013 17% of new HIV infections were among people over 50

Relationship of Comorbidities and Aging Syndromes in HIV

Trends in Comorbid Conditions



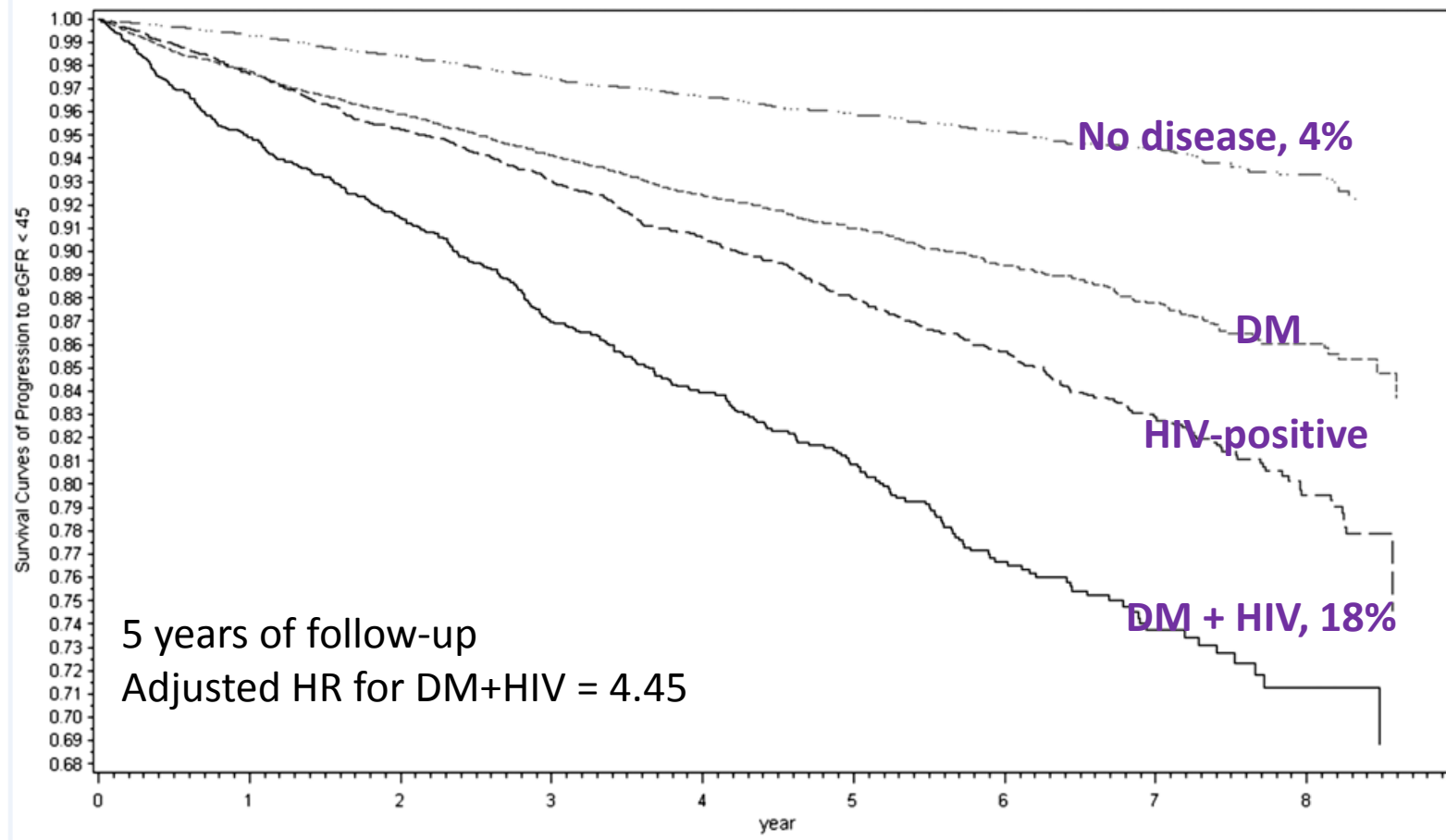
Increased Burden of Comorbidities



Age associated comorbidities included: hypertension, myocardial infarction, peripheral arterial disease, stroke, angina, type 2 diabetes, COPD, chronic kidney disease, non-AIDS cancer, fracture/osteoporosis

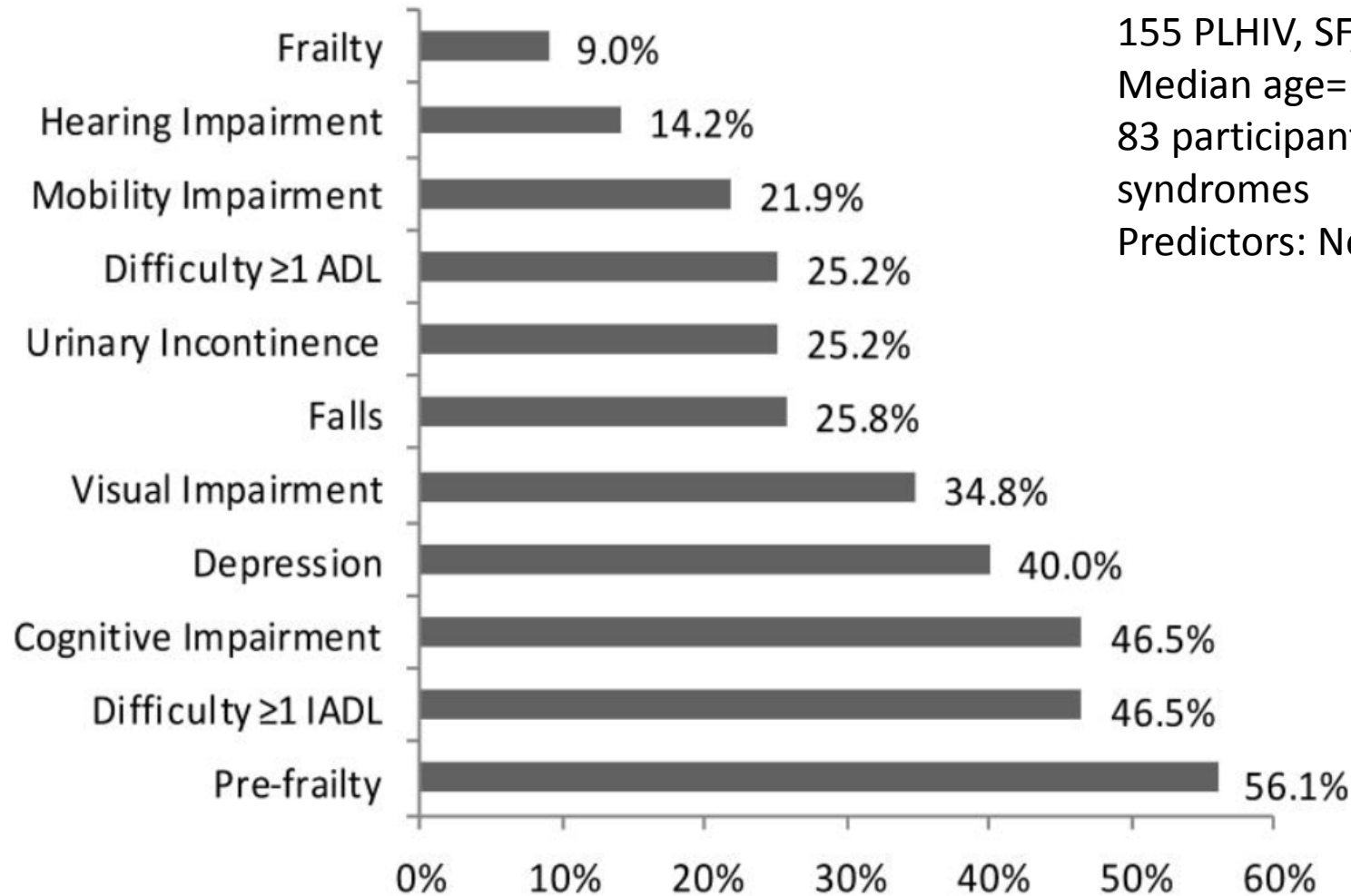
Rate of Progression eGFR

31,000 veterans, progression to eGFR < 45



eGFR = estimated glomerular filtration rate (a marker of kidney function)
DM = diabetes mellitus

Frequencies of Aging Related Syndromes



155 PLHIV, SF, CA

Median age= 57

83 participants (53.6%) w/ 2 or more geriatric syndromes

Predictors: No. of comorbidities and nadir CD4

- Aging related syndromes are frailty or functional decline
- Aging related syndromes may be seen among HIV-infected adults before they are chronologically elderly

Contributing Factors

HIV-infection: Replication, antiretroviral therapy, CD4 count/nadir CD4 count



Lifestyle (i.e. smoking, nutrition, exercise)
Host genetics



Inflammation, Immune Activation, Gut
Microbial Translocation



Comorbidities: CVD, DM, mental health,
bone, renal impairment, liver, malignancy



Age related syndromes: frailty or
functional decline



Decreased Quality of Life and Increased Disability

HIV-infection: Replication, antiretroviral therapy, CD4 count/nadir CD4 count



Lifestyle (i.e. smoking, nutrition, exercise)
Host genetics

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Comorbidities: CVD, DM, mental health,
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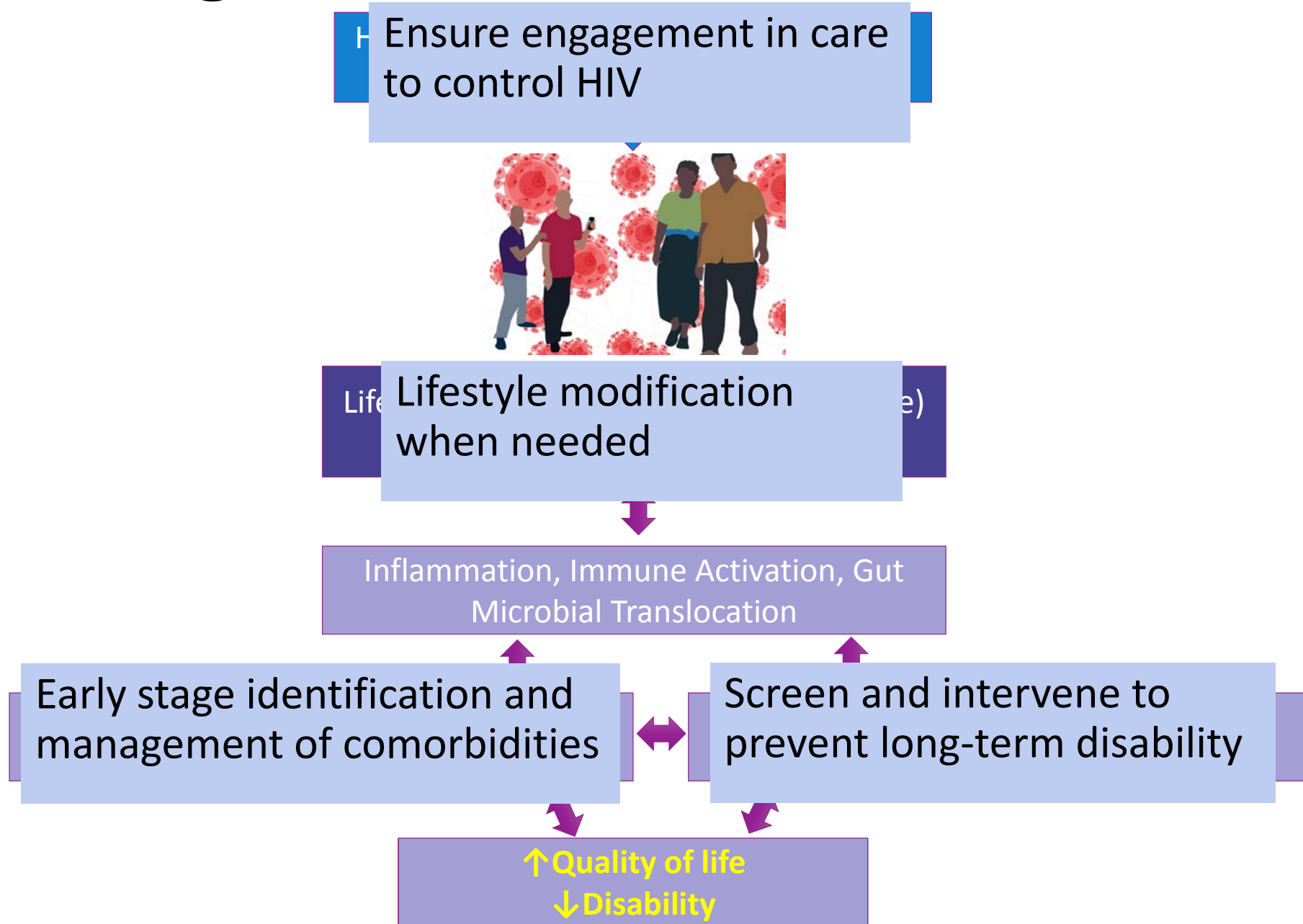
Age related syndromes: frailty or
functional decline

↓ Quality of life
↑ Disability

With Success Comes Challenge

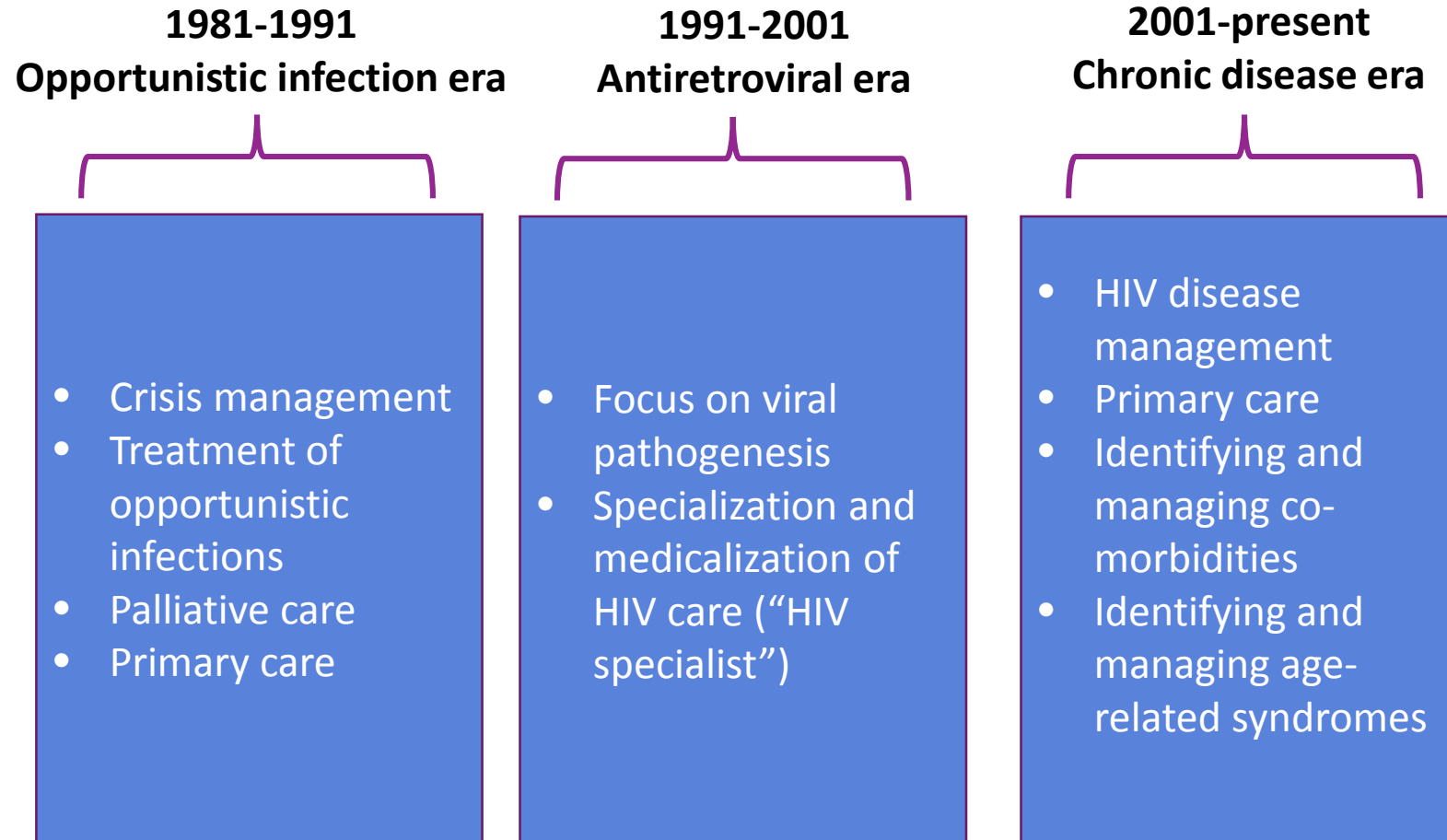
- **Success**
 - Less toxic ART
 - Decreased pill number and frequency
 - Improved knowledge about when to start ART and goals of care
- **Challenge**
 - Increased comorbidity → multimorbidity
 - Comorbidities have separate treatment guidelines that don't "talk" to each other, result can be fragmented care, polypharmacy etc.
 - Increased demand for subspecialist care
 - Multimorbidities may go unrecognized by HIV providers
 - No formal guidance on caring for the aging person with HIV
 - Increased demand for sub-specialist care
 - Increased polypharmacy
 - Increases risk for non-compliance and drug-drug interactions
 - Increased risk of functional decline and disability
 - Geriatric?

Think Long Term: Act Sooner Rather than Later



Care Models for the Aging Population with HIV

Past to Present Eras of HIV Care



Models of Care for Aging Individuals with HIV

- Assessment within the HIV/AIDS dedicated treatment center or ID practice
- Integration into primary care clinic/community health center
- Referral to geriatrician
- Assessment in the home

- PCP completes assessment
- Dedicated MD or NP completes assessment
- Geriatrician completes assessment
- PCP, geriatrician, and subspecialists complete assessment at 1 comprehensive visit



**Ideal model has
geriatrician
involved in
some capacity**

Models Need to Incorporate:

Comprehensive Aging* Assessment

- Basic activities of daily living
- Instrumental activities of daily living
- Frailty
- Nutritional status
- Social network and financial status
- Living situation and accessibility
- Cognitive assessment
- Medical comorbidities
- Medication appropriateness
- Advance directives

Comprehensive Comorbidity Assessment#

- Cardiovascular Health
- Kidney Health
- Liver Health
- Bone Health
- Mental Health

***Term “aging” is preferred over “geriatric”**

#May depend on local patient population



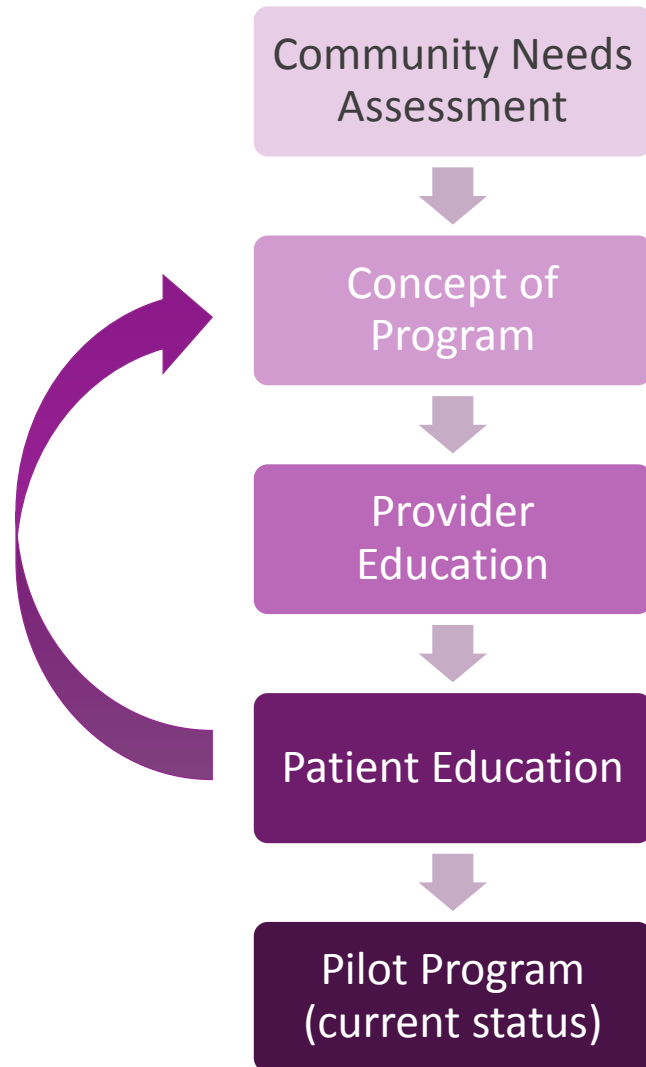
Goals

- **Comprehensive coordinated care, capable of providing:**
 - **Primary care**
 - **Preventive care**
 - **Specialized support for aging HIV+ patients**
- **Should be practical, replicable, and adaptable**

Development of a Designated HIV and Aging Care Program in Boston

- What do we need to know about taking care of people aging with HIV?
- What are successful models of care?
- What are components of successful aging?
- How to we help our patients avoid disease and disability and maintain high function?

Development of the Age Positively Program in Boston



Patients

- How do you feel about aging?
- What would be helpful in this program?
- What local, regional and national needs should be explored?

Providers

- What do staff want to learn?
- How should the clinic work?

General

- Age for consultation
- How will patients be referred
- What is the workflow of the program?

Next Steps:

FEEDBACK

Focus groups with patients and providers

Goals of Care Model

- Develop practice-wide comorbidity screening, aging syndrome assessment, prevention and management approach
- Implementation through a dedicated Age Positively Program visit for all HIV-infected individuals age 50 or older within the MGH Infectious Disease Associates practice in the following areas:
 - Cardiovascular health, Bone health, Diabetes, Kidney health, Mental health, Nutrition, Aging Assessment
- Facilitate education and training in chronic diseases and geriatrics to providers and patients within the practice
- Establish linkages with agencies that work with older HIV-infected individuals to better meet the psychosocial needs of this growing population.

Age Positively Program Flow



Team
APP NP/MD, Nurse, Dietician,
ID provider, Geriatrician,
Neuro, Social Worker,
Psychiatrist, Occupational
Health

Age Positively Program Visit

Collect Data
Electronic
Template
and EMR



Clinic Visit
Screening
Assessments



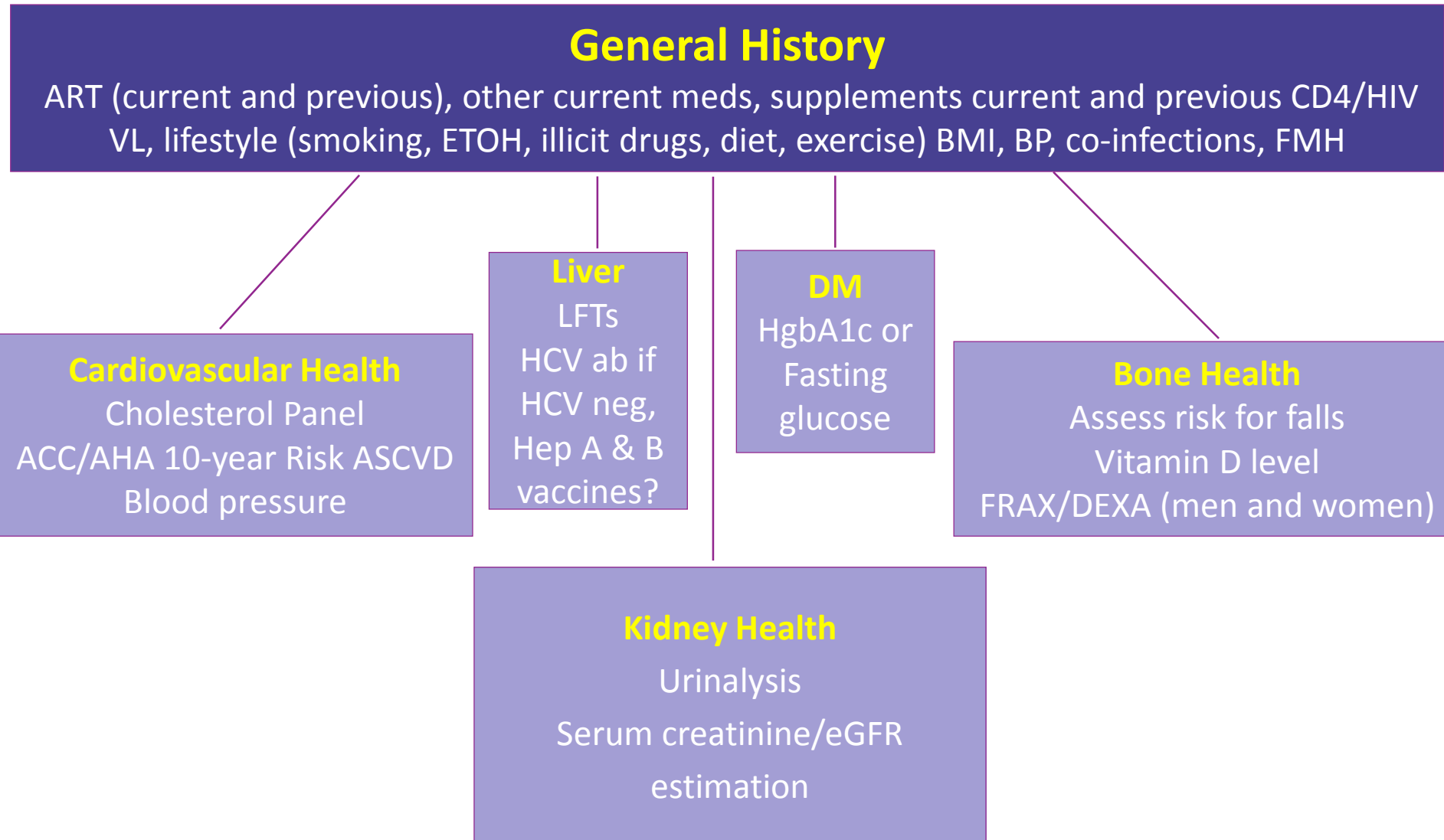
Relay
Findings/Needs
to PCP



Team determines if
further assessment is
necessary or
monitoring in clinic

Follow Up

Comorbidity Assessment



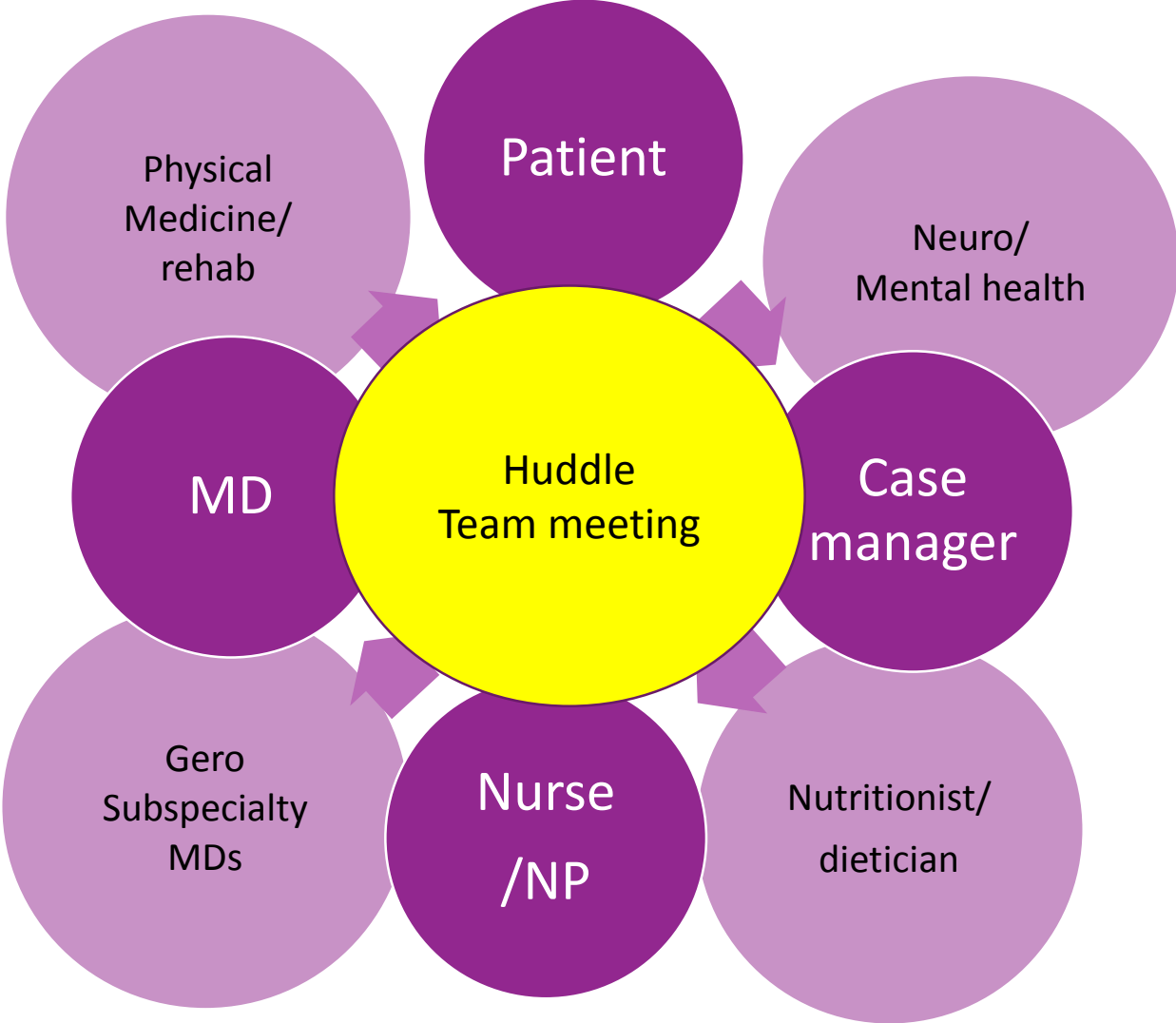
Aging Specific Assessments

Deep iN Screenings			
	Screening Tool	Frequency of screening	Follow Up (if needed)
Depression	PHQ2 (if + GDS15)	Annual	If + to psych ID
Dementia	Mini-cog, if + MoCA	Annual	If + neuro
Dental	Oral exam	Q 6 months	Refer to dental clinic of choice
Eyes (vision)	Snellen/eye exam	Annual	MEEI or pt preference
Ears (hearing)	Whisper test	Annual	MEEI or pt preference
Physical Activity	PA Questions	Annual	RN/PCP
Planning/Advance Directives	Check EMR	Annual	PCP
Functional Status	ADLs/IDLs	Annual	Social work
Frailty	Frailty Questionnaire	Annual	Physical therapy/nutrition/home health
Nutrition	24 hour recall	Annual	Nurition

Additional Activities of Team (Planned)

- Patient education via evening/afternoon workshops
- Provider education via monthly provider meetings

Workflow to Attain



Challenges of Current Model

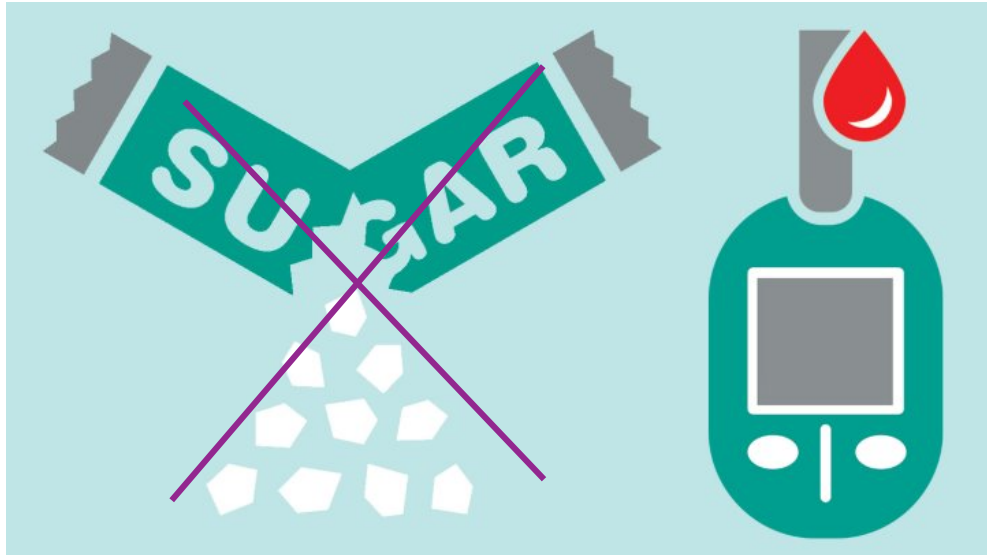
- Staff
- 1 additional visit for patient
- Need to develop continuity plan
- Funding
 - UCSF has funded their program through local AIDS Walk
- Need for more evidence based tools
- Not just an assessment—intervention
- Geriatrician not integrated sufficiently into program

Summary

- The number of comorbidities among people living with HIV is increasing
- Screening for, recognizing and treating comorbidities and age related syndromes early is important to help people living with HIV age positively
- Unique care models are needed to effectively care for this aging population
- Opportunity for clinicians from varied backgrounds (nurses, PAs, nurse practitioners, case managers, MDs) to collaborate and develop care models for this population

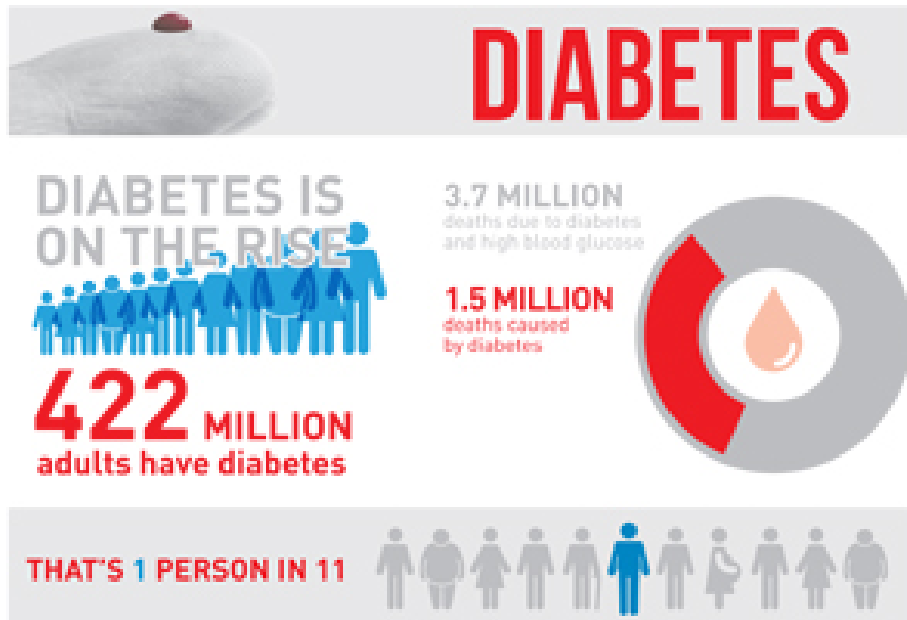
Useful Resources/Reading

- HIV-Age.org:<http://hiv-age.org/clinical-recommendations/>
- Golden Compass (UCSF program)
<https://hiv.ucsf.edu/care/aging.html>
- Elsayy, B & Higgins, KE. The Geriatric Assessment. American Family Physician. 2001; 83: 48-56
- Singh, HK. Et al. From One Syndrome to Many: Incorporating Geriatric Consultation into HIV Care. CID. 2017; 65: 501-506
- Brennan-Ing, M & DeMarco RF (eds.). HIV and Aging, 2017.
- AIDS, June 1st, 2017 31 (Suppl 2). Note: supplement on HIV and Aging



HIV and Diabetes

Why are We Talking About Diabetes?



- Very common in the general population and rapidly increasing prevalence in the US and internationally
- One of the leading causes of CVD, blindness, kidney disease, hospitalization
- Diabetes can be treated and its consequences avoided or delayed with diet, physical activity, medication and regular screening and treatment for complications
- Common in HIV-infected populations

Diabetes in the Setting of HIV

- Prevalence ranges from 2-14% in HIV
 - Varies by composition of the cohort studied
 - How diabetes diagnosis is made
 - How risk factors are accounted for in the analysis
- Some studies show increased risk of diabetes in the setting of HIV while other studies show no independent effect

Pathogenesis of Diabetes in HIV

- Antiretroviral medications
 - Thymidine analogues and older PIs
- HIV Factors
 - Immune activation/inflammation
- Risk Factors
 - Body composition
 - HCV co-infection
 - Genetic factors: family history, race
 - Lifestyle factors: diet, physical activity
 - Concomitant medications: steroids, atypical antipsychotics, opiates, testosterone

Case

- 54 year old African American woman, HIV+ for 12 years with central adiposity
- Mild hypertension, normal lipids, + smoker
- Mother with history of diabetes
- BMI is in overweight category
- Fasting glucose is 110 mg/dL (confirmed with repeat testing)
- Hemoglobin A1c is 6.3%

ADA Definitions of Diabetes

1. Fasting plasma glucose $\geq 126\text{mg/dL}$ (confirmed with repeat testing)
2. Plasma glucose 2 hours after 75g oral glucose tolerance test $\geq 200\text{mg/dL}$ (confirmed with repeat testing)
3. Hemoglobin A1c % $\geq 6.5\%$ (confirmed with repeat testing*)
4. Random plasma glucose $\geq 200\text{mg/dL}$ and symptoms of diabetes (polyruria, polydipsia, polyphagia, weight loss)

*HgbA1c underestimates glycemia in individuals with HIV, in HIV HgbA1c may be 1-0.5% lower difference related to a low grade hemolysis in HIV and may not be reliable in HIV

Diabetes Screening

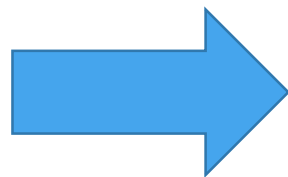
- Fasting glucose
 - If 100-125 mg/dL consider 75g oral glucose tolerance test
- Timing of screening:
 - Prior to ART initiation, within 4-6 weeks after ART initiation and every 6-12 months thereafter

Next Steps: Guidelines Focus on Personalized Management

- Initial management
 - Lifestyle modification-goal is weight loss
 - Diet
 - Monitor carbohydrates, limit sugar-sweetened beverages, follow Mediterranean Diet, watch portion sizes
 - Exercise
 - 30 minutes of moderate-to-vigorous intensity aerobic exercise at least 5 days a week or 150 minutes per week
 - Switch ART regimens
 - Consider if a patient is on lopinavir/ritonavir or a thymidine analogue
 - Switching is of uncertain benefit
- Medication therapy
 - Metformin is first-line medication
 - Advantages: safety and efficacy data are well known, no hypoglycemia, no weight gain, low cost
 - Disadvantages: risk of lactic acidosis and caution when coadministering with dolutegravir
 - Second line
 - Sulfonylureas
 - Thiazolidinediones (TZDs)
 - Insulin

Case: How to Proceed

- 54 year old African American woman, HIV+ for 12 **years with central adiposity**
- Mild hypertension, normal lipids, + smoker
- **Mother with history of diabetes**
- **BMI is in overweight category**
- **Fasting glucose is 110 mg/dL** (confirmed with repeat testing)
- Hemoglobin A1c is 6.3% (remember HgbA1c% may be falsely low in HIV)



Try lifestyle interventions, goal is weight loss, refer to nutritionist, work with patient to identify reasonable exercise plan, recheck fasting plasma glucose in 6 months. Follow up to reinforce lifestyle measures.

References

- Online video by Todd Brown, MD
https://www.prn.org/index.php/complications/article/managing_diabetes_in_hiv_infected_patients
- Monroe et al. CID. Diagnosing and Managing Diabetes in HIV-Infected Patients: Current Concepts. 2015:60.