

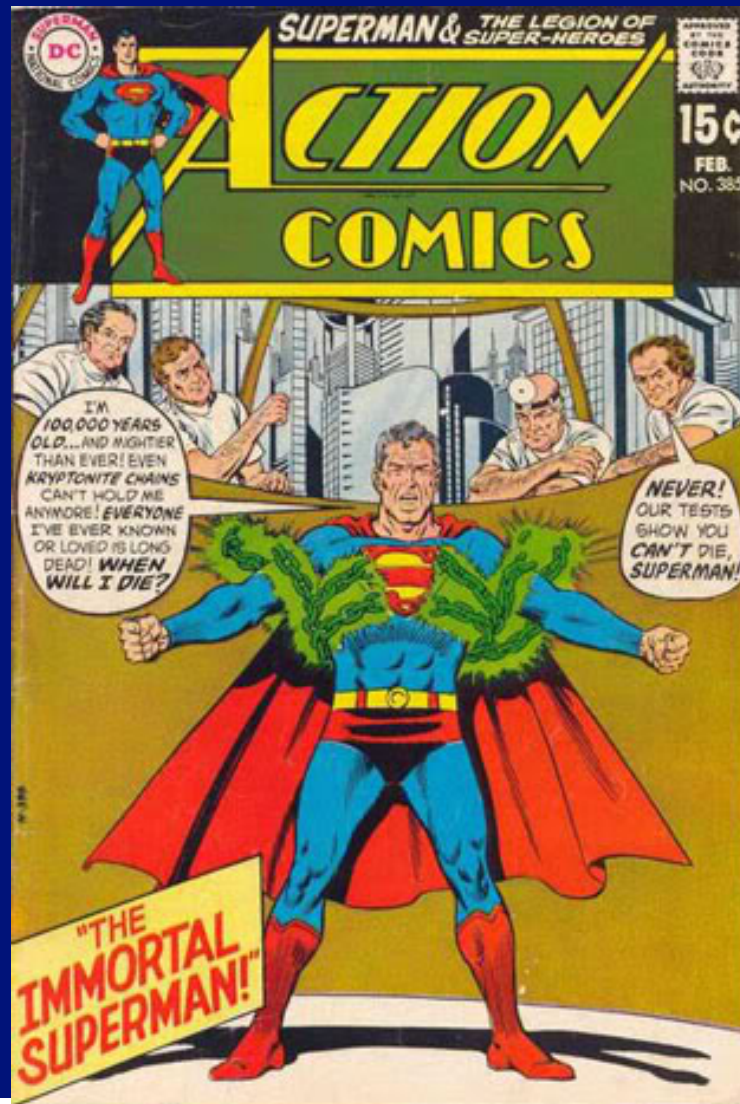
Optimizing Health While Aging with HIV



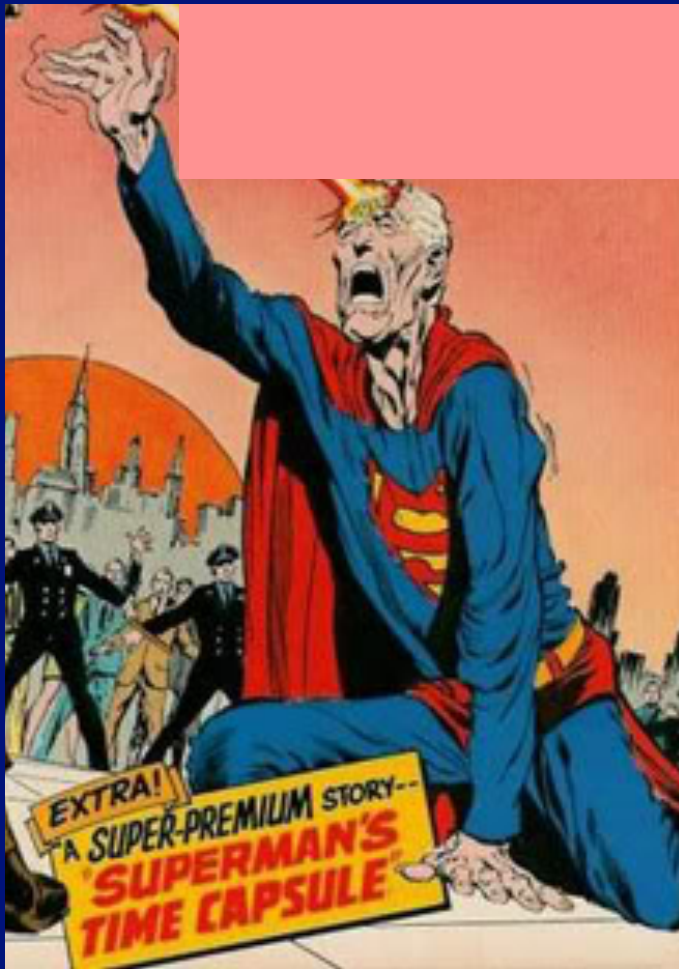
Todd T. Brown, MD, PhD
Division of Endocrinology and Metabolism
Johns Hopkins University

Chronological Age $\neq$ Biological Age

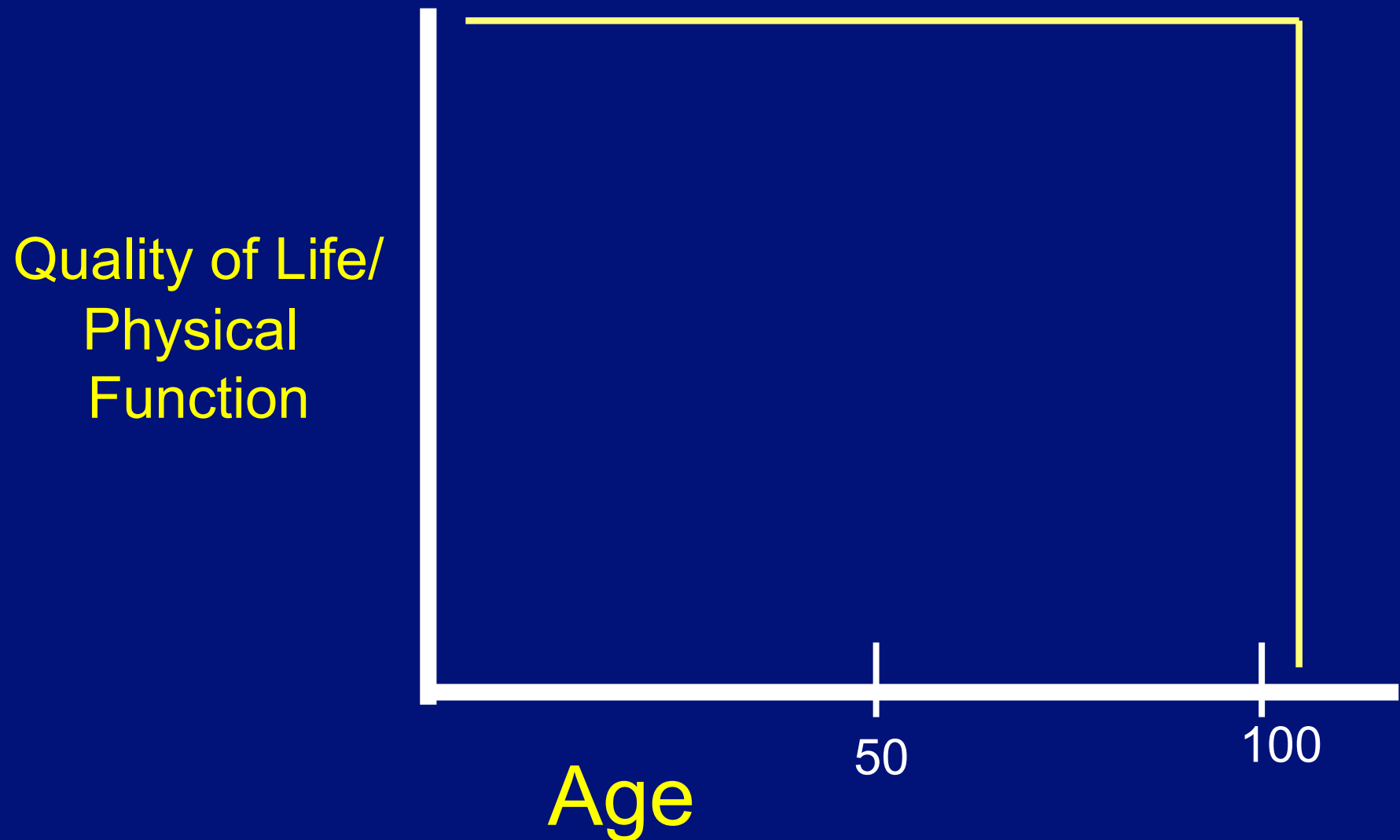
Unfortunately, We are Not Immortal...



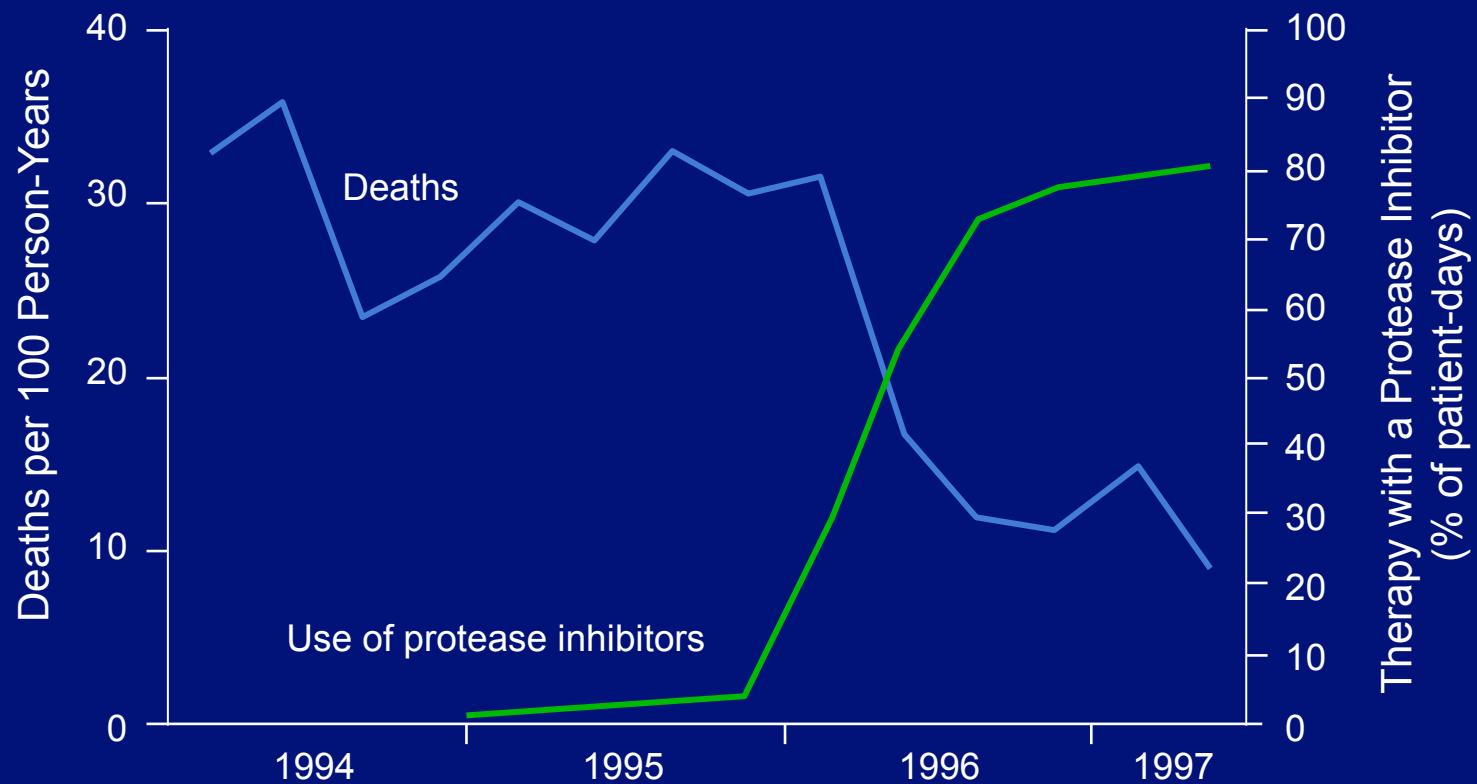
But How Do We Want to Age?



The Ideal Life: Quality x Time



The Impact of Highly Active Antiretroviral Therapy (HAART) on HIV Mortality



Projected Proportion of those Living With HIV in United States 50+ Years* 2001-2017



*Data from 2008, onward projected based on 2001-2007 trends (calculated by author), 2001-2007 data from CDC Surveillance Reports 2007

Slide Courtesy of Amy Justice, MD, PhD

Diseases more Common Among HIV-infected Persons

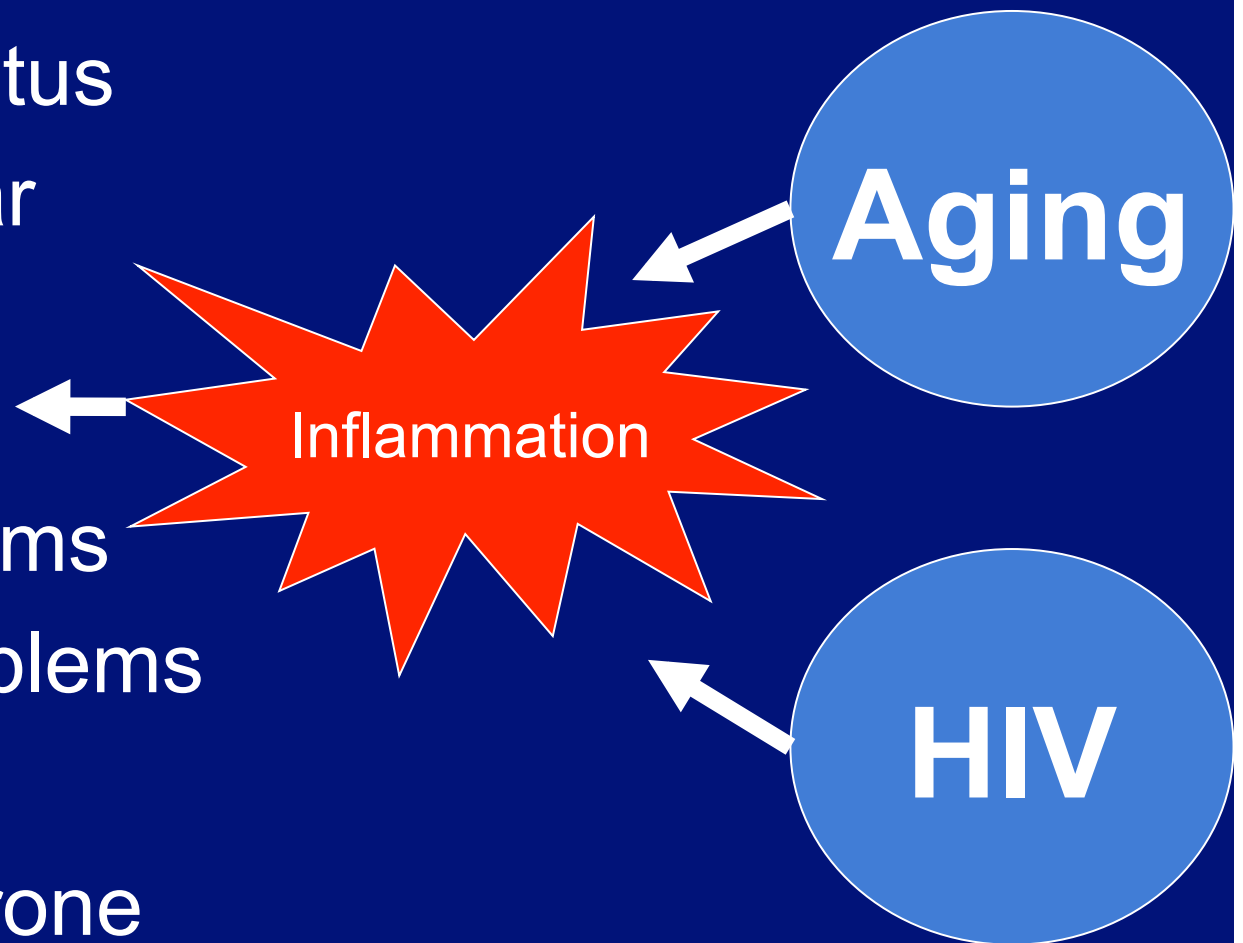
- Diabetes Mellitus
- Cardiovascular Disease
- Cancer
- Kidney Problems
- Cognitive Problems
- Osteoporosis
- Low Testosterone



Are HIV-infected Persons Aging Faster?

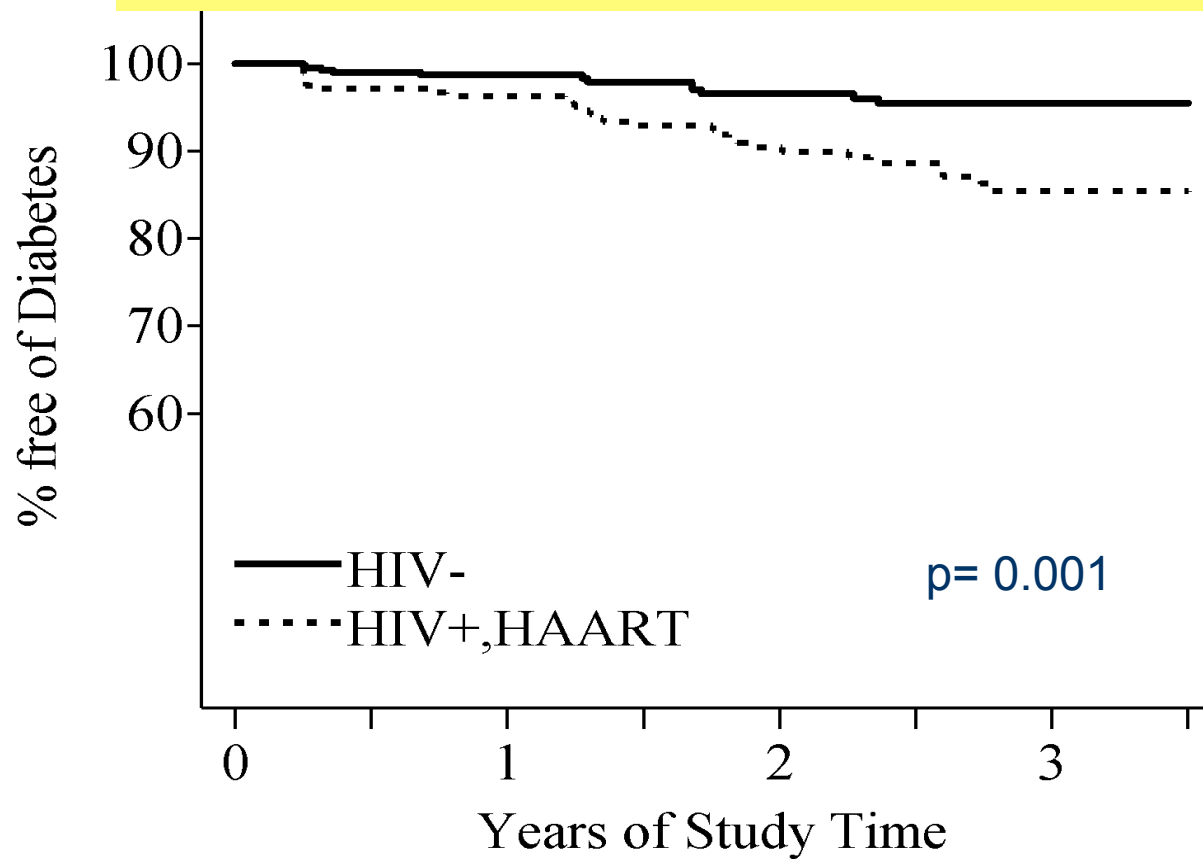
Diseases more Common Among HIV-infected Persons

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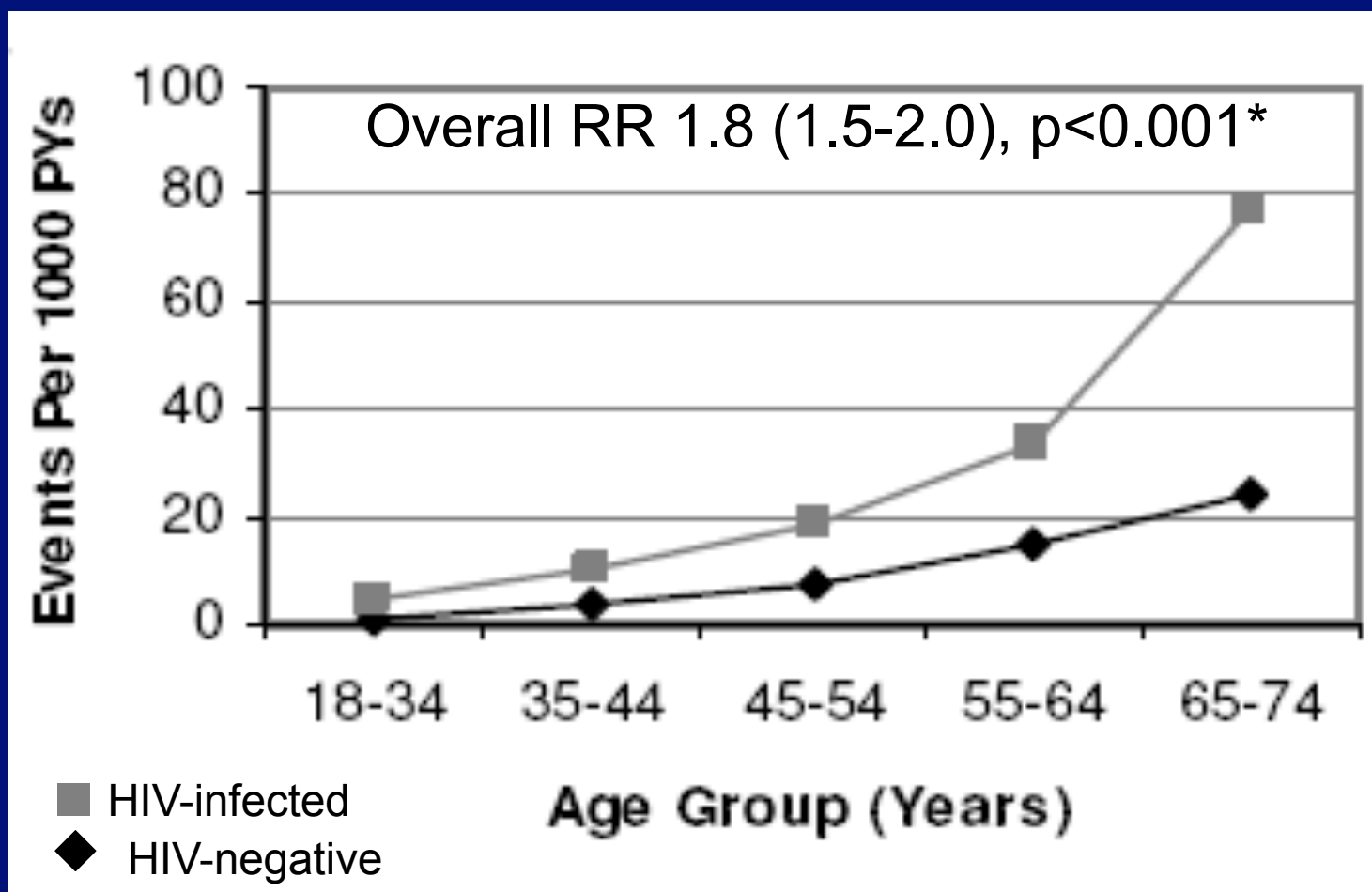
Risk of Incident Diabetes Mellitus in the Multicenter AIDS Cohort Study (1999-2003)

4 fold increased risk of DM in HAART-treated men



* Adjusted for age and BMI at study entry Brown, Arch Int Med, 2005

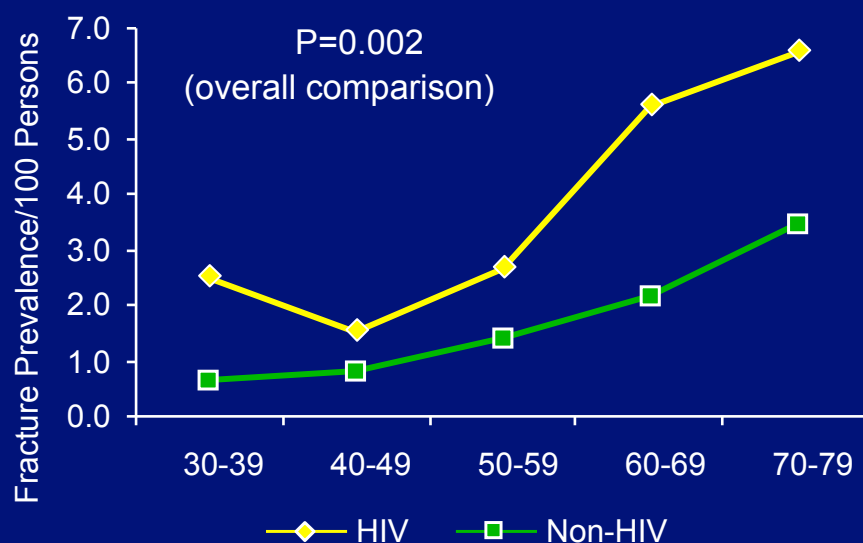
Myocardial Infarction in HIV-infected and uninfected Patients: MGH Study



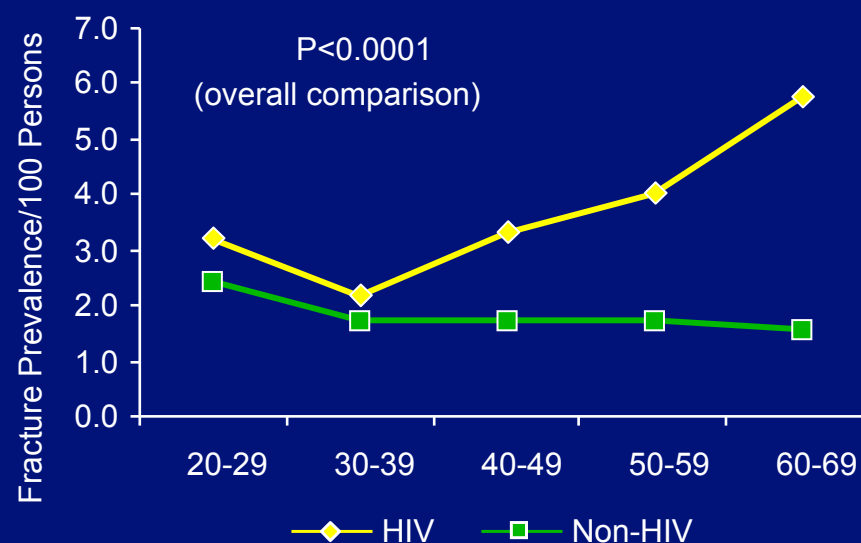
*adjusted for age, gender, race, HTN, DM, dyslipidemia

Triant, JCEM, 2007

Fracture Prevalence in HIV-infected and non-HIV-infected Persons in MGH/Partners Healthcare System: 1996-2008



Women



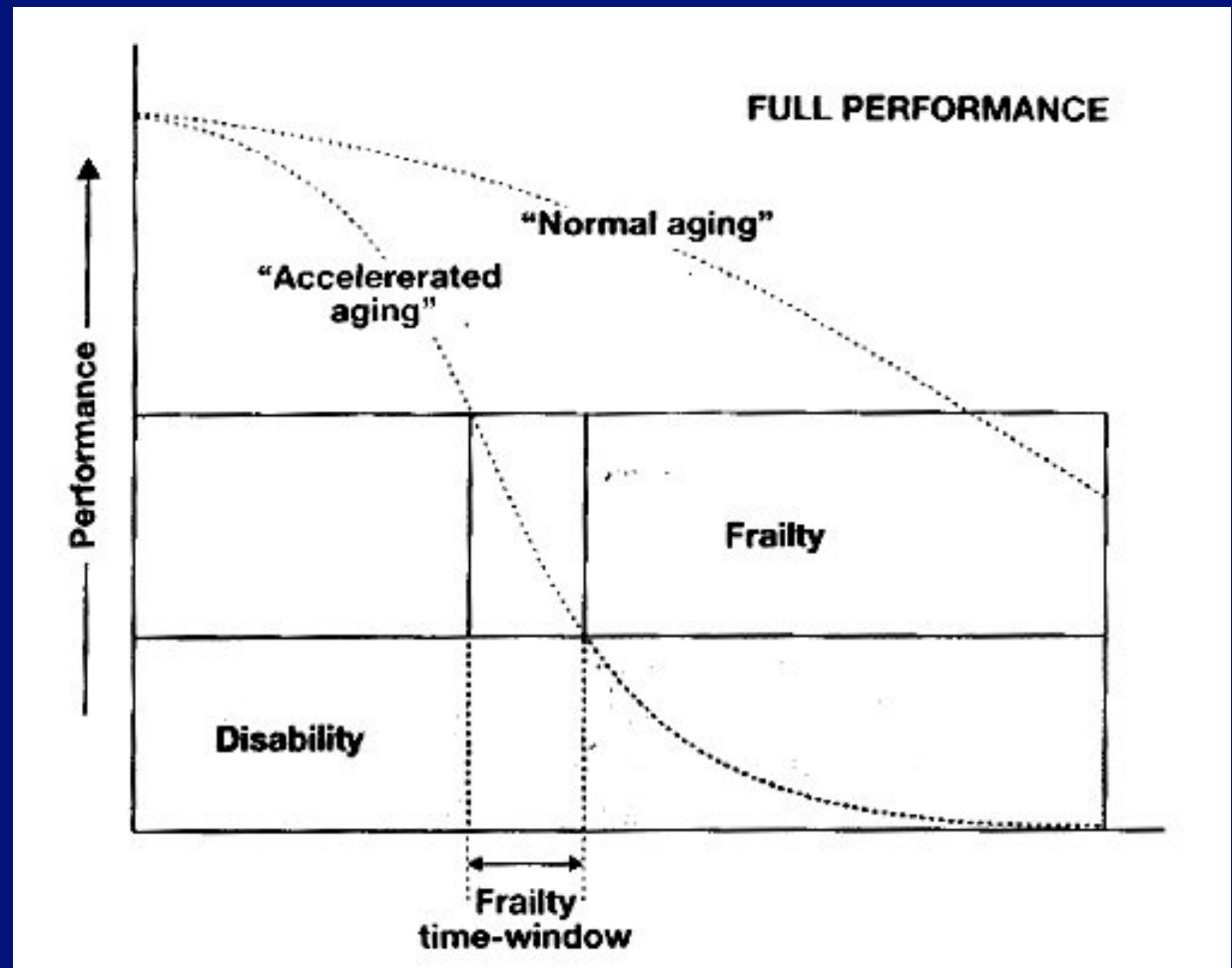
Men

8,525 HIV-infected
2,208,792 non HIV-infected patients

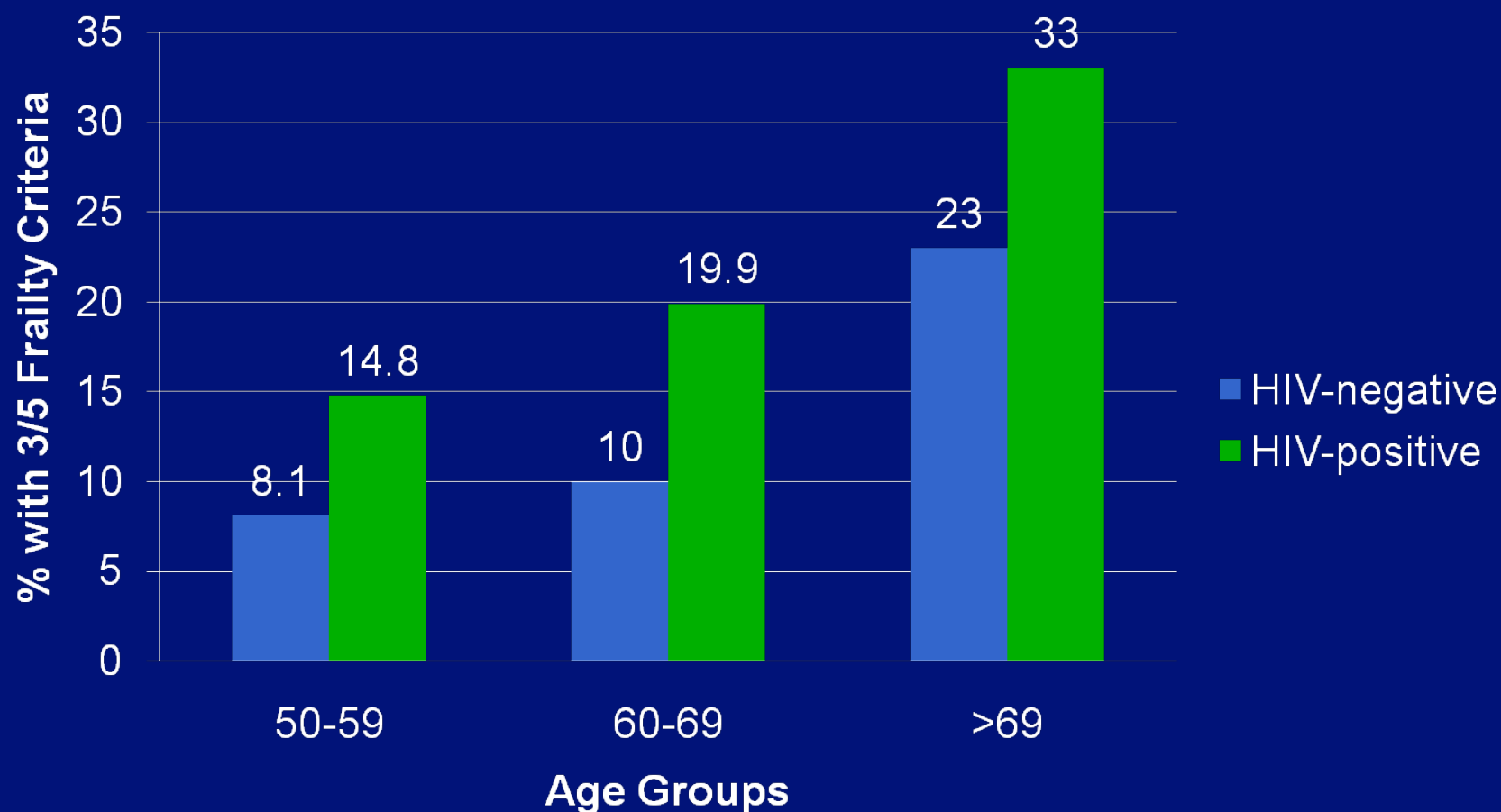
Frailty: A Brief Overview

Slide 14

- **Weight loss**
- **Weakness**
- **Exhaustion**
- **Slowness**
- **↓ Physical Activity**



HIV+ Men Are More Frail At a Younger Age vs HIV- Men: MACS

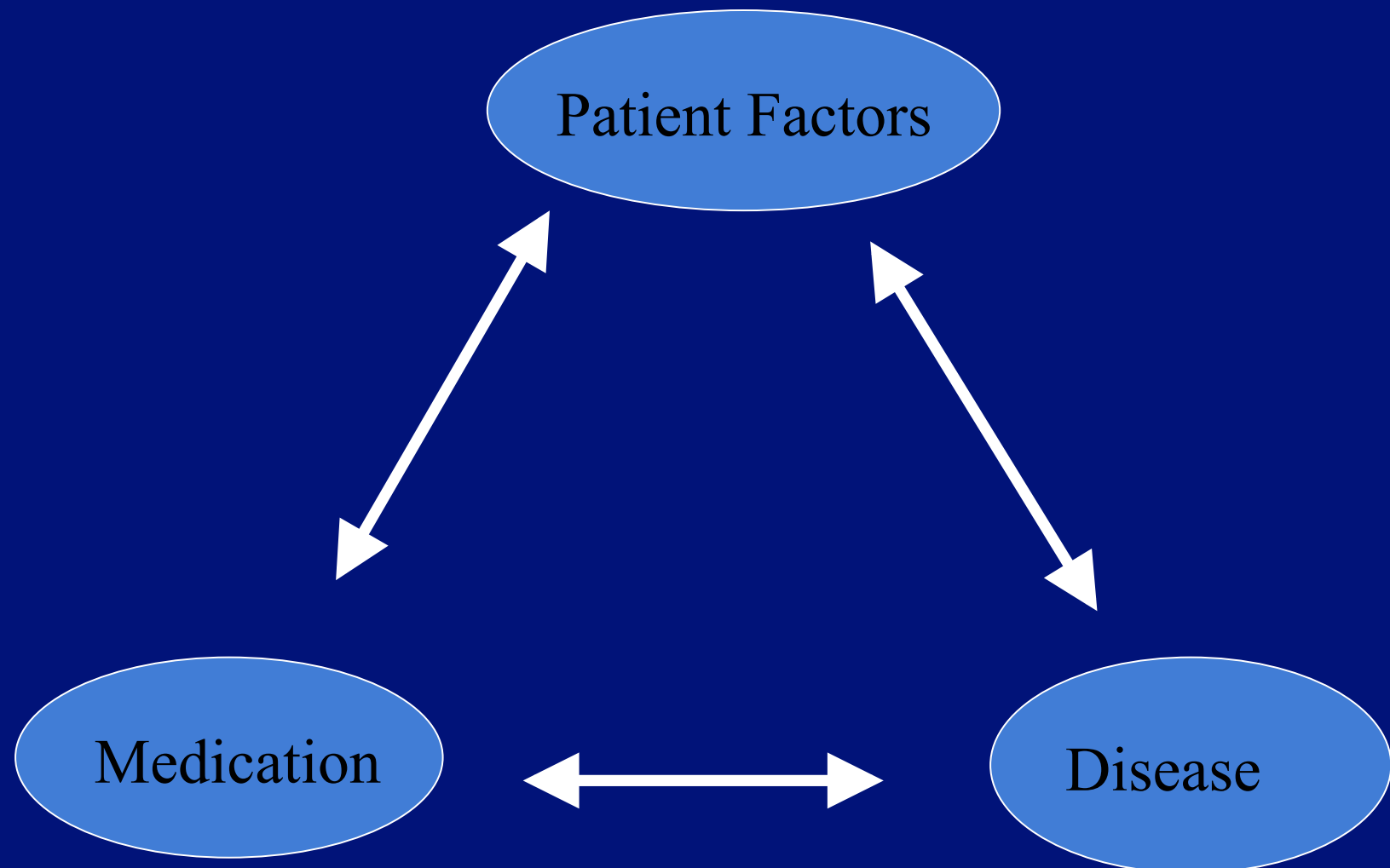


Margolick, CROI, 2011

Concerning? **YES**

Depressing? **NO**

Causes of Non-AIDS Diseases in HIV



Patient Factors

Non-Modifiable

(Things You Can't Change)

- Age
- Sex
- Genes (Your Family)

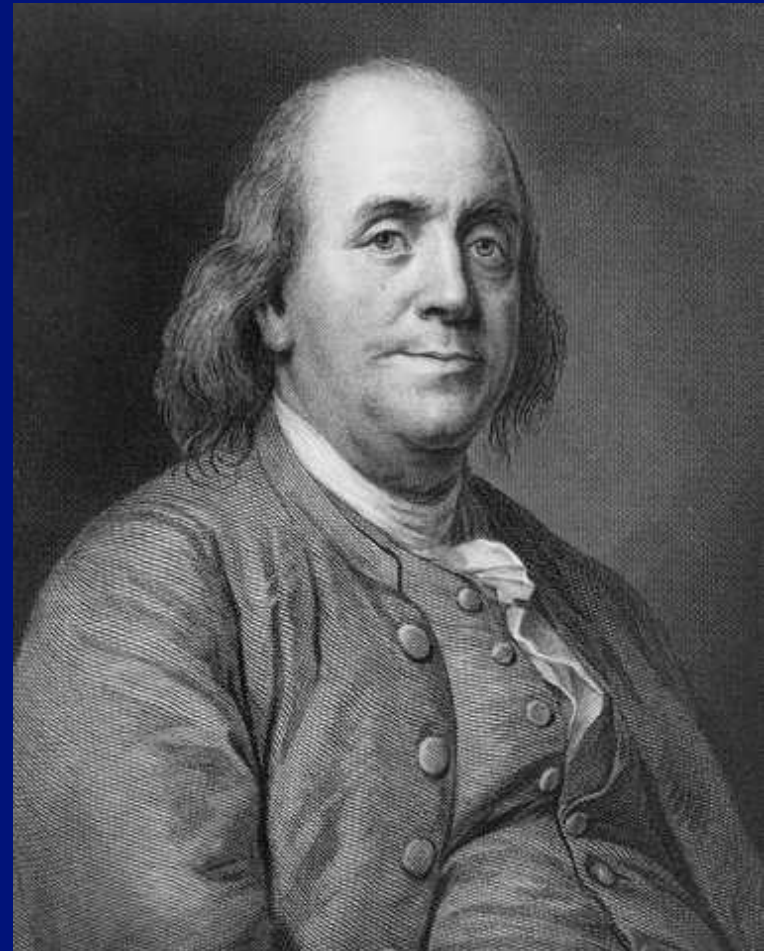
Modifiable

(Things You Can Change)

- Weight
- Smoking
- Alcohol
- Exercise
- Eating
- Adherence to ART

“An ounce of
prevention is
worth a pound of
cure”

Benjamin Franklin



General Rules for Prevention

- Optimize a Healthy Lifestyle
- Make sure known risk factors are identified and treated/addressed
- Get screened
- Know about your diseases

- Diabetes

Environment

INSULIN RESISTANCE

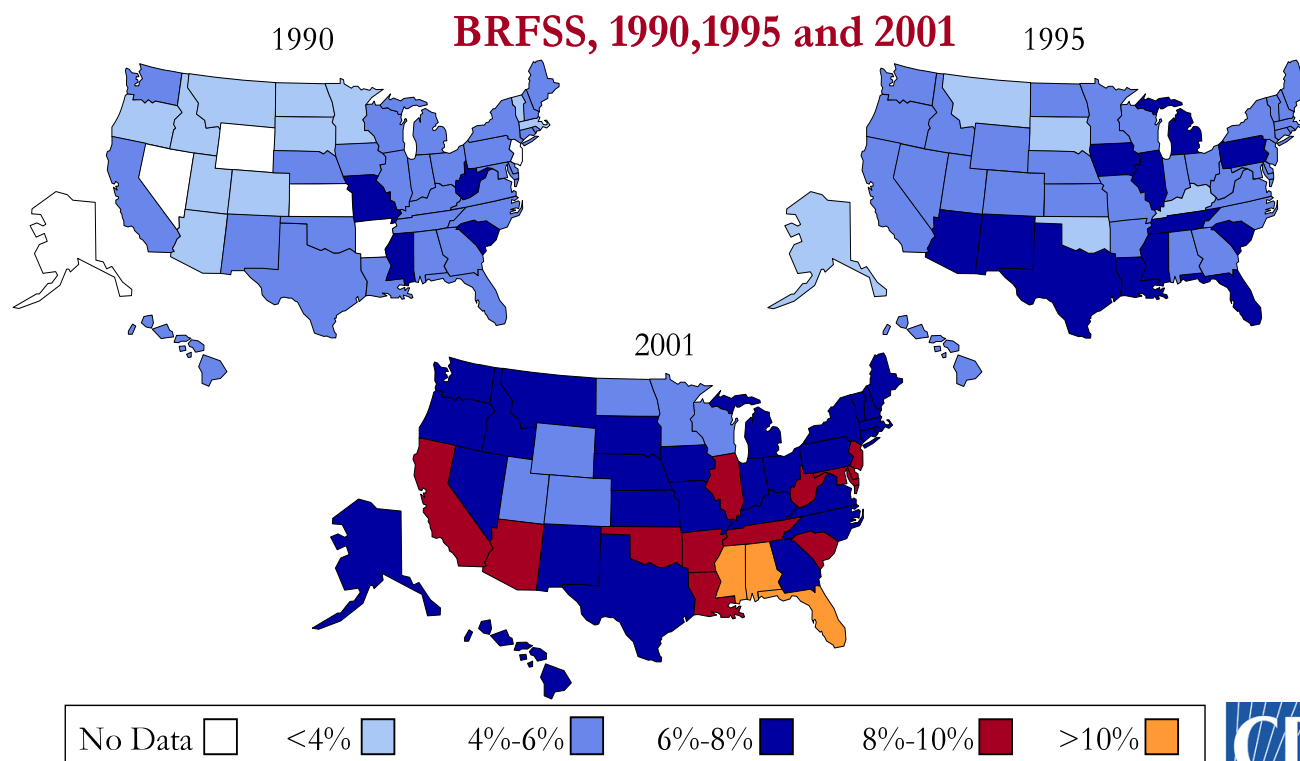


DEFECTIVE
INSULIN
SECRETION

GENES

HIGH SUGAR

Diabetes Trends* Among Adults in the U.S., (Includes Gestational Diabetes)



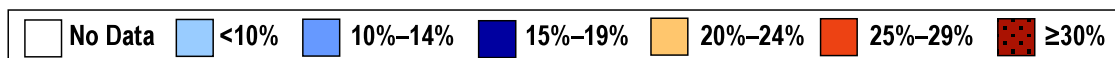
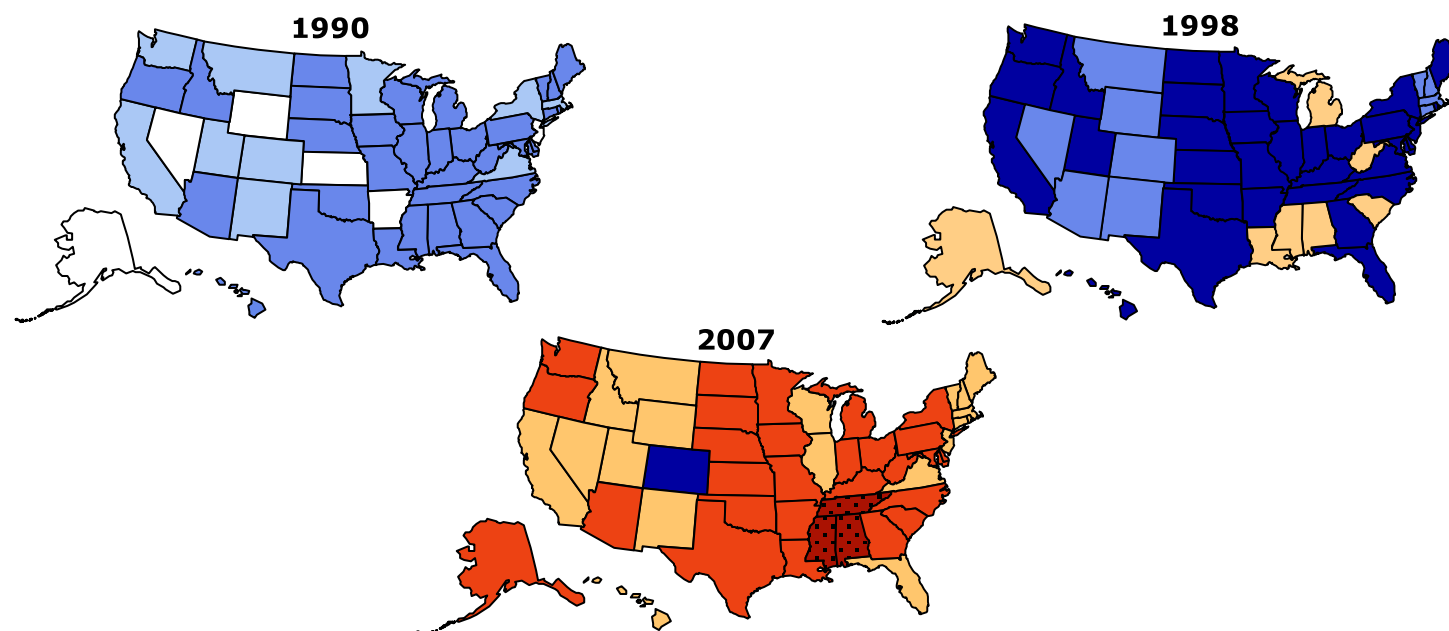
Source: Mokdad et al., *Diabetes Care* 2000;23:1278-83; *J Am Med Assoc* 2001;286:10.



Obesity Trends* Among U.S. Adults

BRFSS, 1990, 1998, 2007

(*BMI ≥ 30 , or about 30 lbs. overweight for 5'4" person)



Source: CDC Behavioral Risk Factor Surveillance System.

What to do if you have diabetes?

- Lifestyle modifications (eg lose weight)
 - Diabetes is often not a one-way street
 - Losing weight (5-10%) can significantly improve sugar control
- Know Your HgbA1c (Goal < 7%)
- Take medications as prescribed
- Make sure you are getting yearly diabetic foot exams, eye exams, urine microalbumin, lipid profiles

What to do to prevent diabetes?

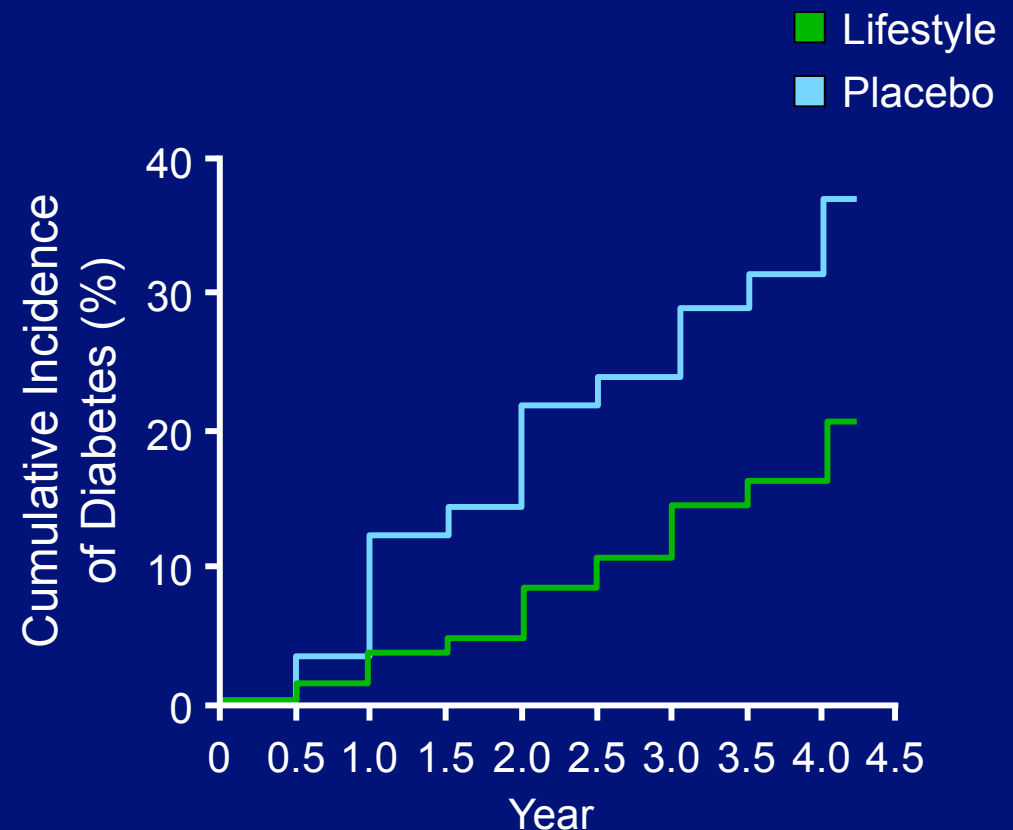
- Lifestyle Modifications: Lose weight if you're overweight or obese (5-10%)
- Increase exercise
- Get screening with a fasting glucose

Lifestyle Modifications for Prediabetes

Diabetes Prevention

Program:

150 minutes/week of exercise and caloric restriction (goal: 7% weight loss) associated with a 58% reduction in the incidence of diabetes vs placebo^[1]



1. Knowler WC, et al. N Engl J Med. 2002;346:393-403.

Lifestyle Modification: Diet

- Cutting 500 calories per day will decrease your weight by 1-2 lbs week
- Watch portion sizes

Portion Distortion

What you're served



1/2 lb. cheeseburger, French fries,
3/4 cup ketchup, tomato slice and lettuce.
1,345 calories
53 grams fat

What's one serving



1/4 lb. cheeseburger, half the French fries,
2 tablespoons ketchup, tomato slice and lettuce.
685 calories
33 grams fat

DID YOU KNOW?

- Americans are the heaviest of people in developed countries. The U.S. surgeon general has called obesity a national epidemic.
- 61 percent of Americans are overweight.

- Consuming an extra 100 calories daily for a year, without using them up, can lead to a weight gain of 10 pounds.
- Every gram of carbohydrate or protein equals 4 calories.

- The number of overweight people in the world — 1.1 billion — now equals the number of undernourished people.
- With each decade as we age, we need 100 fewer calories per day.

- Every gram of fat equals 9 calories.
- 10 calories a day (2 hard candies) of unexpended energy puts on an extra pound a year.

© L S Dean

BAGEL

20 Years Ago



140 calories
3-inch diameter

Today



350 calories
6-inch diameter

Calorie Difference: 210 calories

SPAGHETTI AND MEATBALLS

20 Years Ago



500 calories
1 cup spaghetti with
sauce and 3 small
meatballs

Today



1,025 calories
2 cups of pasta with
sauce and 3 large
meatballs

Calorie Difference: 525 calories

Lifestyle Modification: Diet

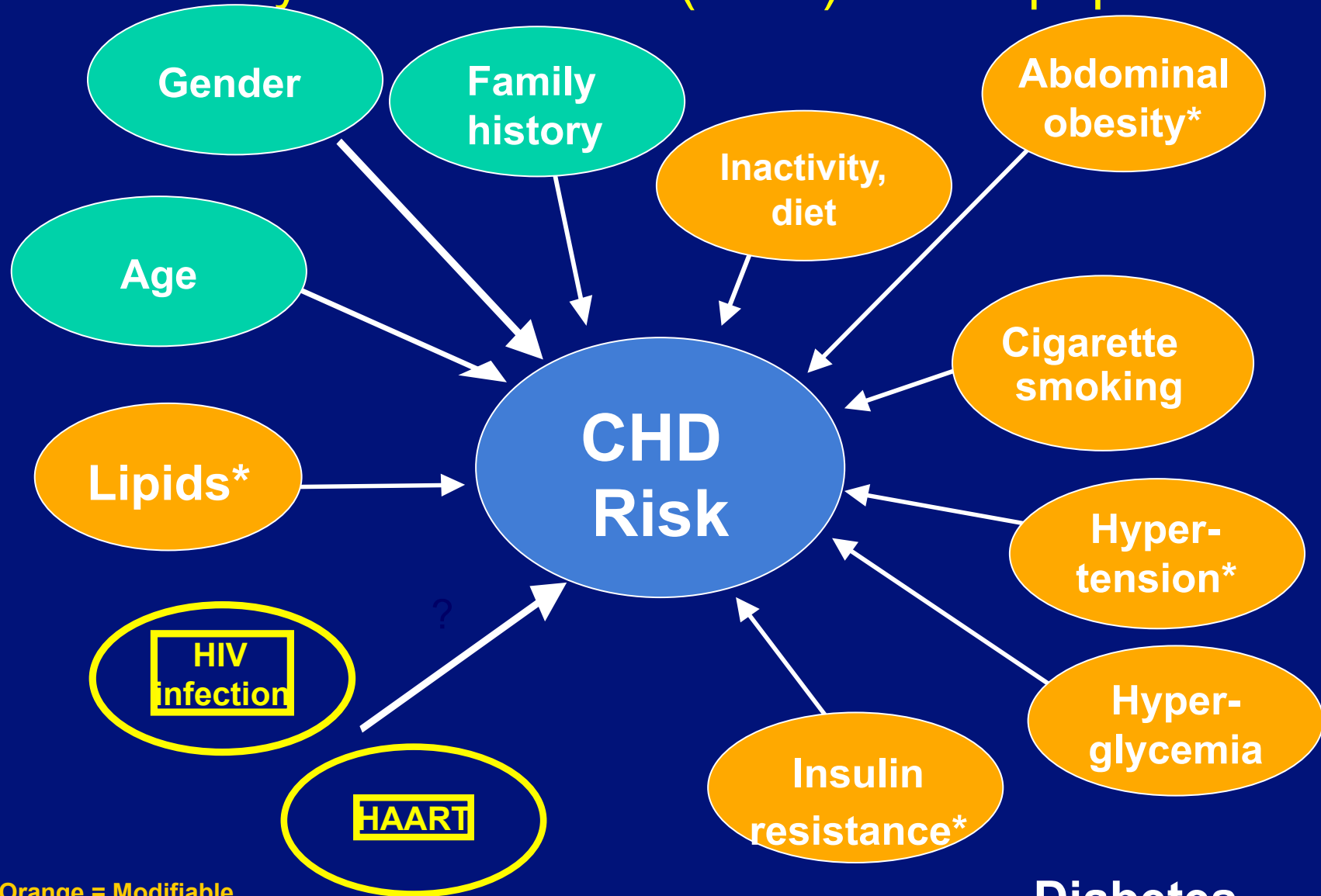
- Cutting 500 calories per day will decrease your weight by 1-2 lbs week
- Watch portion sizes
- Watch liquid calories (soda, juice, fruit drinks)
- Go natural
 - Avoid foods in boxes and cans (less salt and preservatives)
 - Maximize fresh fruits and vegetables
 - Mediterranean Diet as an example

Lifestyle Modification: Exercise

- 150 minutes/week of exercise (minimum)
 - Do something you like (combination of cardio/strength)
- Set a fitness goal (eg 5K race)
- Find a fitness buddy
- Get outside (www.letsmove.gov)
- Unplug
- Be active during day: If job is sedentary, take breaks to walk
- Take stairs rather than elevator; park further away to walk to work

- Diabetes
- Cardiovascular Disease

Traditional factors important are contributors to coronary heart disease (CHD) in HIV populations



Orange = Modifiable

Green = Non-modifiable

*Metabolic syndrome

Diabetes

The “ABCDs” of Cardiovascular Disease Management

A: Aspirin

B: Blood pressure

C: Cholesterol

D: Diabetes

S: Smoking

The “ABCDs” of Cardiovascular Disease Management

A: Aspirin (75 to 162 mg/day: baby aspirin)

- Required if you've had a heart attack
- If no previous heart disease, aspirin should be considered if your risk of having a heart attack in the next 10 years is $> 10\%$
 - Men > 50 years
 - Women > 60 years of age with at least one risk factor (positive family history of cvd, hypertension, smoking, dyslipidemia, albuminuria)

Cardiovascular Assessment: Framingham Risk Equation

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**NATIONAL CHOLESTEROL EDUCATION PROGRAM**
Third Report of the Expert Panel on
Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)

Information about your risk score:

Age:	53
Gender:	male
Total Cholesterol:	283 mg/dL
HDL Cholesterol:	35 mg/dL
Smoker:	Yes
Systolic Blood Pressure:	121 mm/Hg
On medication for HBP:	No
Risk Score*	26%

Means 26 of 100 people with this level of risk will have a heart attack in the next 10 years

* Y
pro
det

Should HIV-infected patients on HAART be treated differently?

To find out what your risk score means and how to lower your risk for a heart attack, go to ["High Blood Cholesterol—What You Need to Know"](#) and visit the ["Live Healthier, Live Longer" Web site.](#)

<http://hin.nhlbi.nih.gov/atpiii/calculator.asp>

The “ABCDs” of Cardiovascular Disease Management

A: Aspirin

B: Blood pressure

- Goal: $< 130/80$
- Watch out for salt (most comes from processed foods)
- Exercise/weight loss has a big effect
- Many different choices for blood pressure medications

The “ABCDs” of Cardiovascular Disease Management

A: Aspirin

B: Blood pressure

C: Cholesterol

Your Lipid Panel

Test	Goal	Notes	Effect of HIV/ART	Treatment
Total Cholesterol	< 200		High	
Triglycerides	<150		Very high: may be able to switch ART	Low fat diet, weight loss, niacin, fish oil, fibrate
HDL	> 40 in men, > 50 in women	“H”: Happy cholesterol	Low, but increases with ART	Exercise, niacin
LDL	<100 or <130	•“L”: Lousy cholesterol •Most important target	Higher with certain HIV meds	Statins

The “ABCDs” of Cardiovascular Disease Management

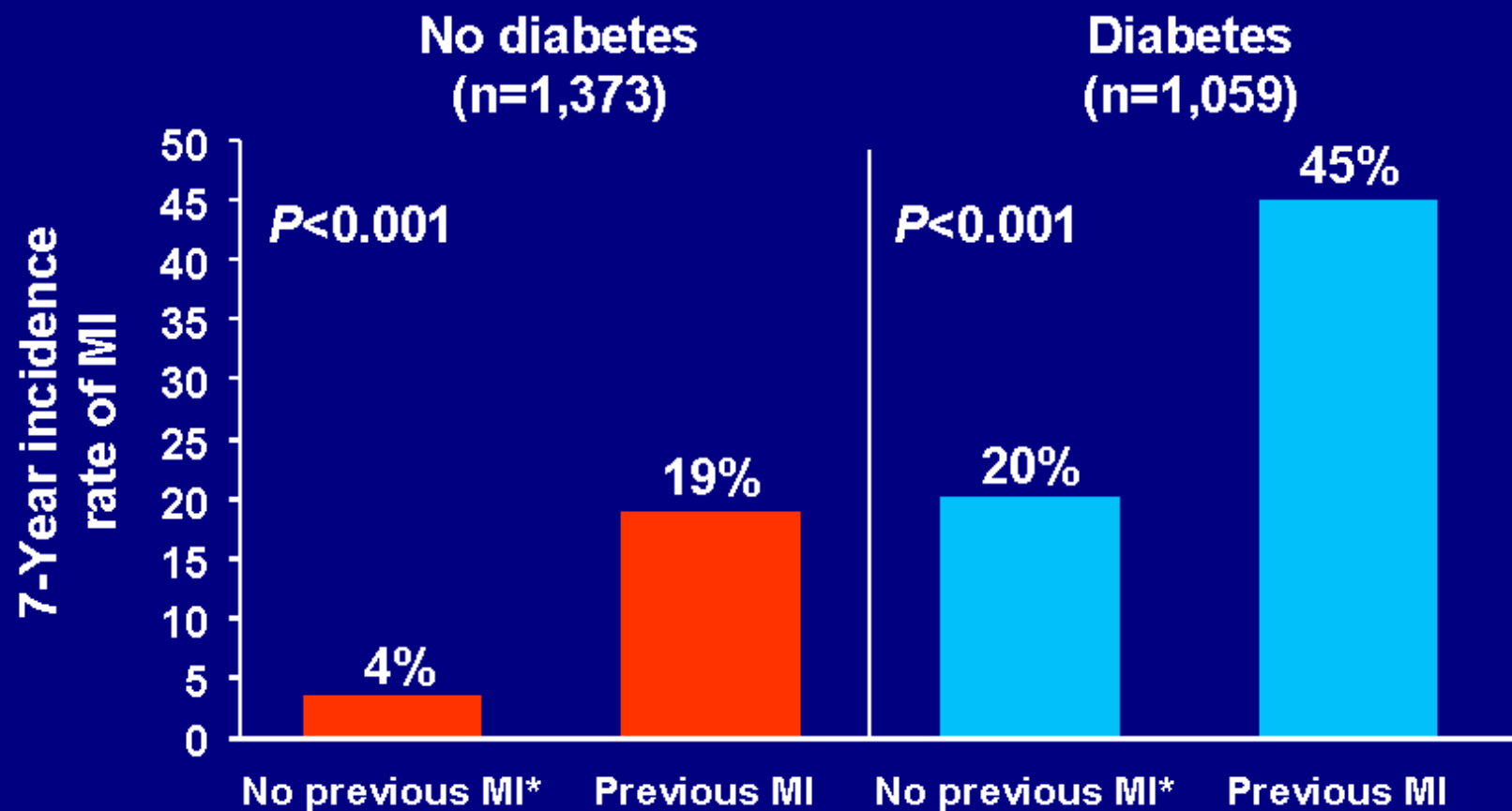
A: Aspirin

B: Blood pressure

C: Cholesterol

D: Diabetes

Diabetes is a CAD Risk Equivalent



Haffner, NEJM, 1998

The “ABCDs” of Cardiovascular Disease Management

A: Aspirin

B: Blood pressure

C: Cholesterol

D: Diabetes

S: Smoking



No Smoking

- Diabetes
- Cardiovascular Disease
- Cancer

Cancers in HIV Disease

AIDS-Defining

- Kaposi's Sarcoma
- Non-Hodgkin's Lymphoma (systemic and CNS)
- Invasive Cervical Carcinoma

Virus

HHV-8
EBV, HHV-8
HPV

Non-AIDS Defining

- Anal Cancer
- Hodgkin's Disease
- Leiomyosarcoma (pediatric)
- Squamous Carcinoma (oral)
- Merkel cell Carcinoma
- Hepatoma

HPV
EBV
EBV
HPV
MCV
HBV, HCV

Change in Incidence of Cancers in HIV in the HAART Era in USA

- Kaposi's sarcoma
- CNS Lymphoma
- Lymphoma (NHL)
- Lymphoma (HD)
- Cervical Cancer
- Anal Cancer
- Lung Cancer
- Prostate
- Breast
- Hepatoma



Cancer Prevention

- Stop Smoking
- Hepatitis and HPV vaccination
- Yearly cervical and anal Pap tests
- Colon cancer screening
- Breast, prostate exam every year
- Advise sunscreen and avoid overexposure
- If Hepatitis B or C positive, screening for liver cancer

- Diabetes
- Cardiovascular Disease
- Cancer
- Kidney Problems

Kidney Problems in HIV

- More Common in those with:
 - Diabetes
 - High Blood Pressure
 - Untreated HIV
 - On certain antiretrovirals
- Should get screening lab testing every 6-12 months (creatinine clearance, urine protein)

- Diabetes
- Cardiovascular Disease
- Cancer
- Kidney Problems
- Cognitive Problems
 - Tell your doctor if you're having problems thinking, remembering
 - Exercise your brain (learn new things, read, etc)

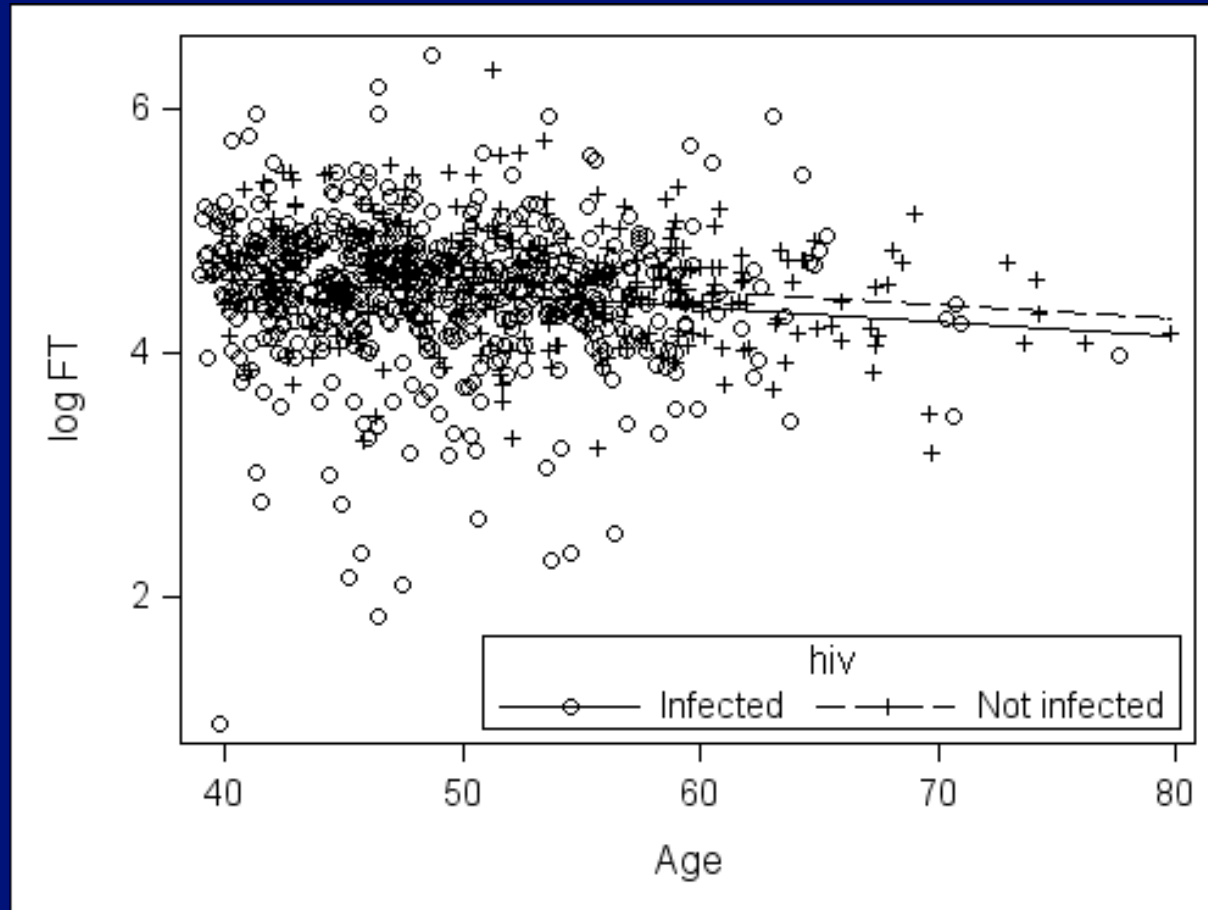
- Diabetes
- Cardiovascular Disease
- Cancer
- Kidney Problems
- Cognitive Problems
- Osteoporosis

How to Avoid Osteoporosis

- Get 1000-2000 IU of Vitamin D daily (if you already have osteoporosis, get your vitamin D checked)
- Get calcium in your diet (dairy products)
- Exercise
- Get a bone density test over age 50
- If you have fallen or are worried about it, tell your doctor
- Stop smoking

- Diabetes
- Cardiovascular Disease
- Cancer
- Kidney Problems
- Cognitive Problems
- Osteoporosis
- Low Testosterone

HIV effect on free testosterone equivalent to ~ 13 years: MACS CV Substudy



β HIV status: -0.13, $p < 0.001$; β age: -0.01, $p < .0001$

322 HIV-uninfected and 534 HIV-infected men

Monroe, Endo Soc, 2010

Key Signs and Symptoms Associated With Low Testosterone

Signs

- Increased body fat, BMI
- Reduced muscle bulk and strength
- Low bone density
- Loss of body hair, reduced shaving
- Increase breast tissue

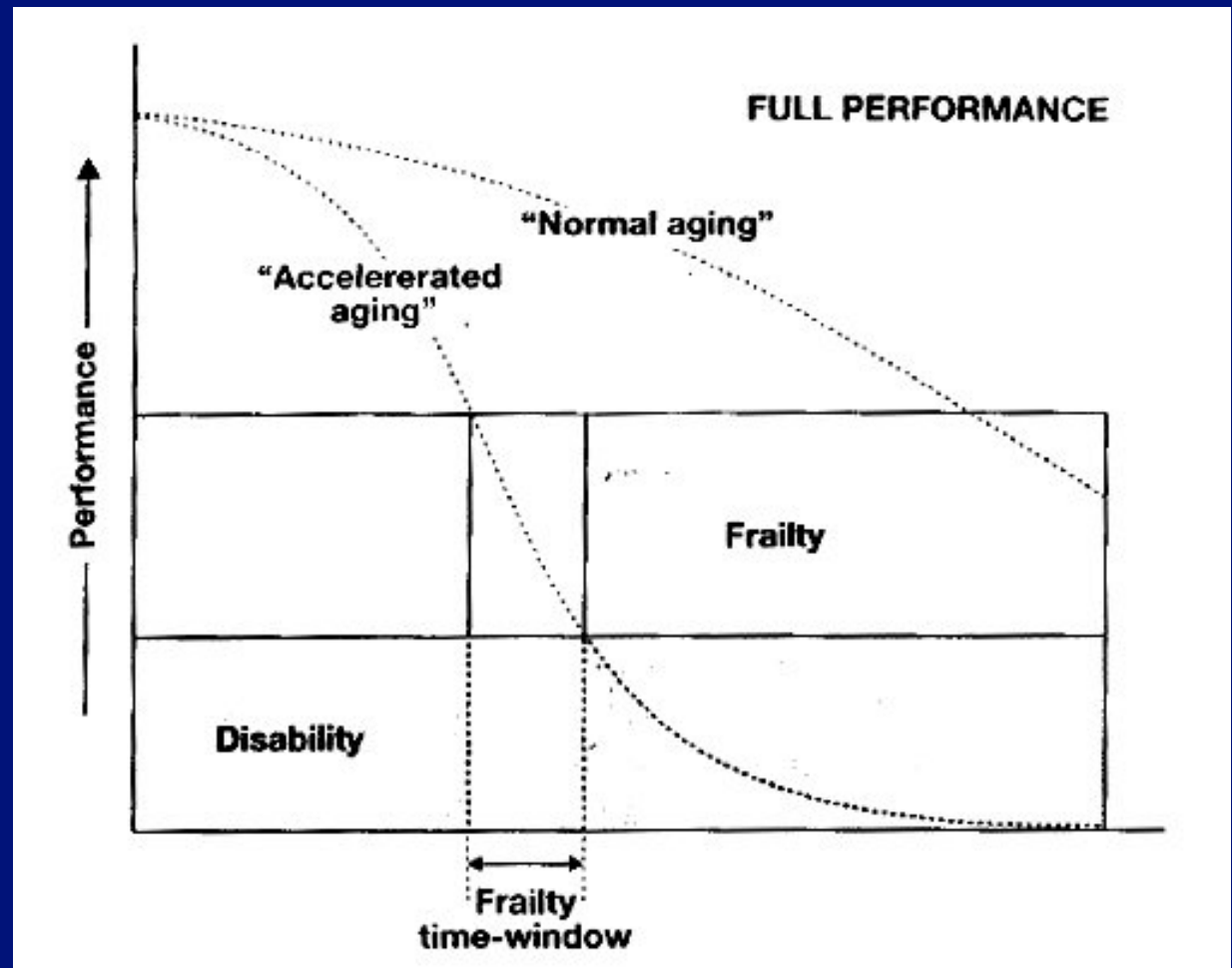
Symptoms

- Low energy
- Depressed mood
- Trouble with erections
- Low sex drive libido
- Poor concentration and memory
- Sleep disturbance

Frailty: A Brief Overview

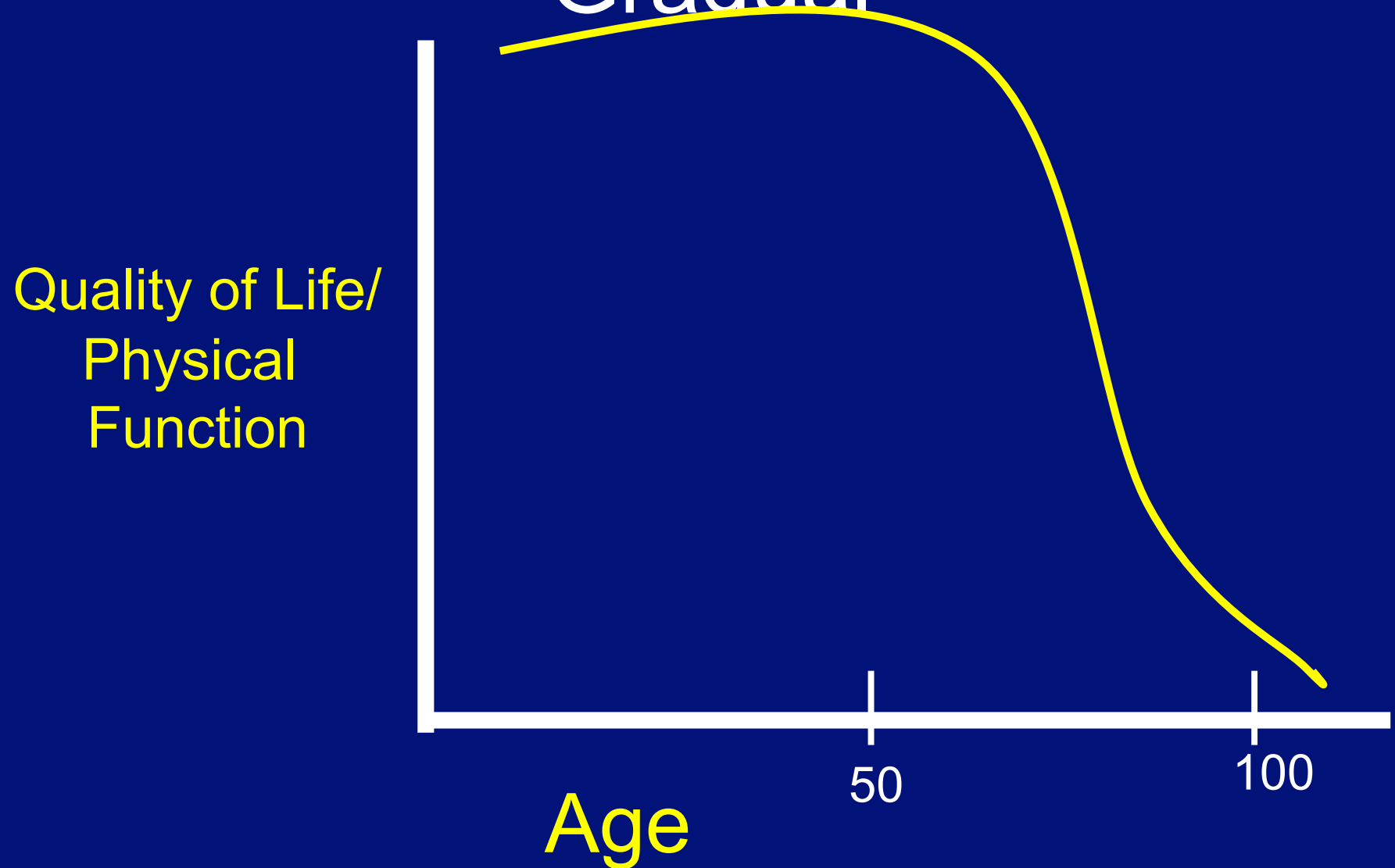
Slide 58

- **Weight loss**
- **Weakness**
- **Exhaustion**
- **Slowness**
- **↓ Physical Activity**

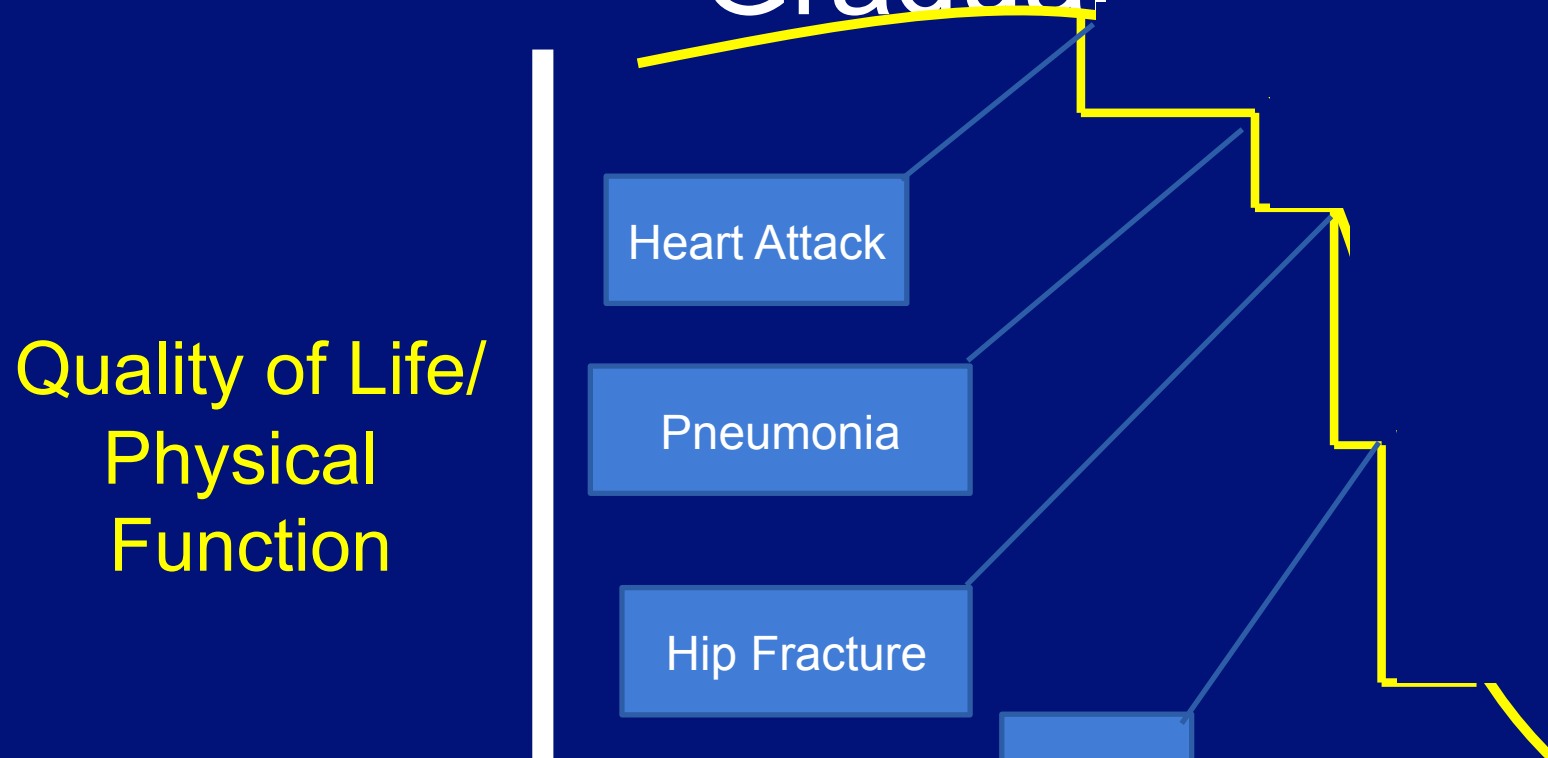


Decline in Function May Not Be Gradual

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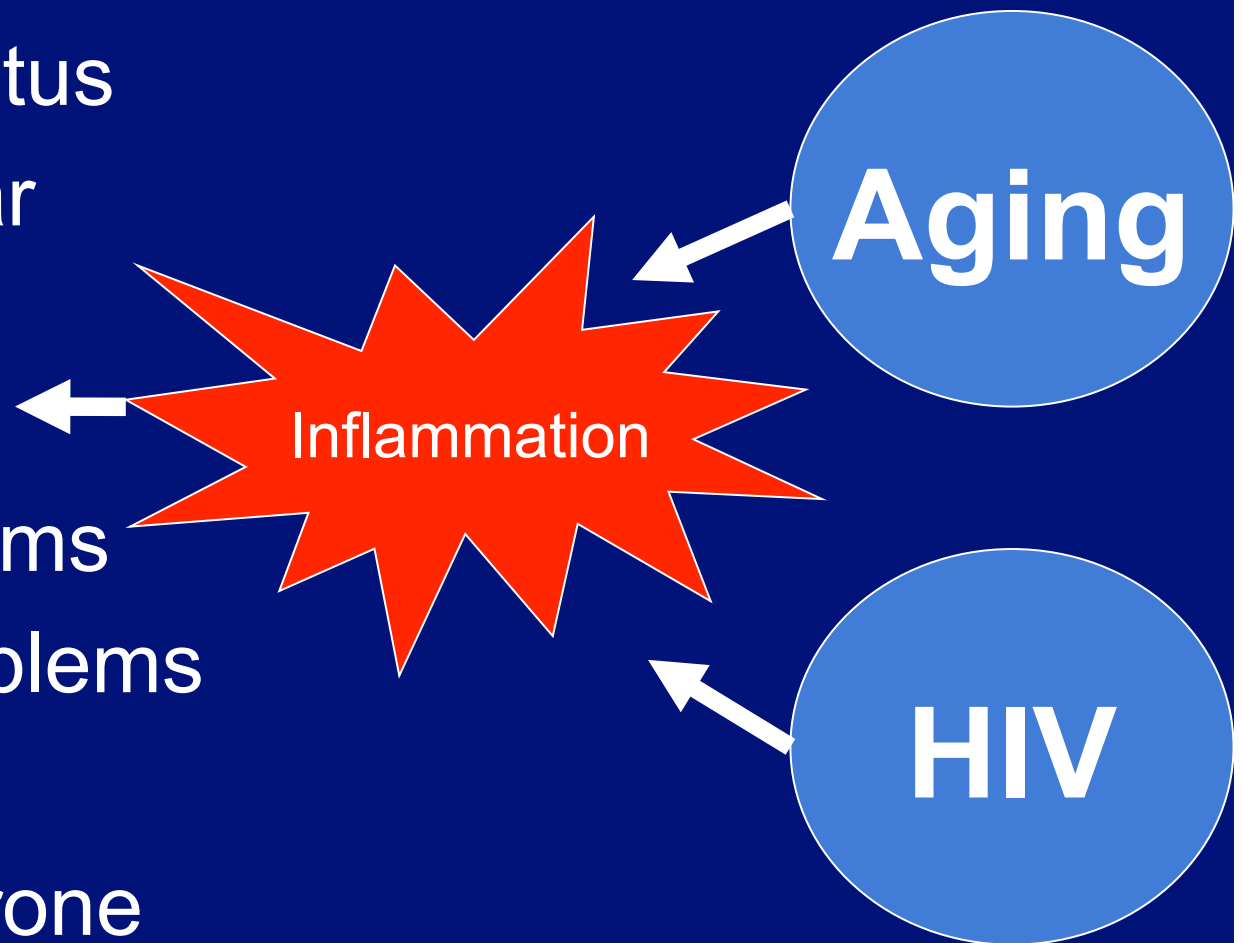
Decline in Function May Not Be Gradual



A major goal of the treatment of acute illness is to regain function → Use physical and occupational therapy

Important Role of Inflammation

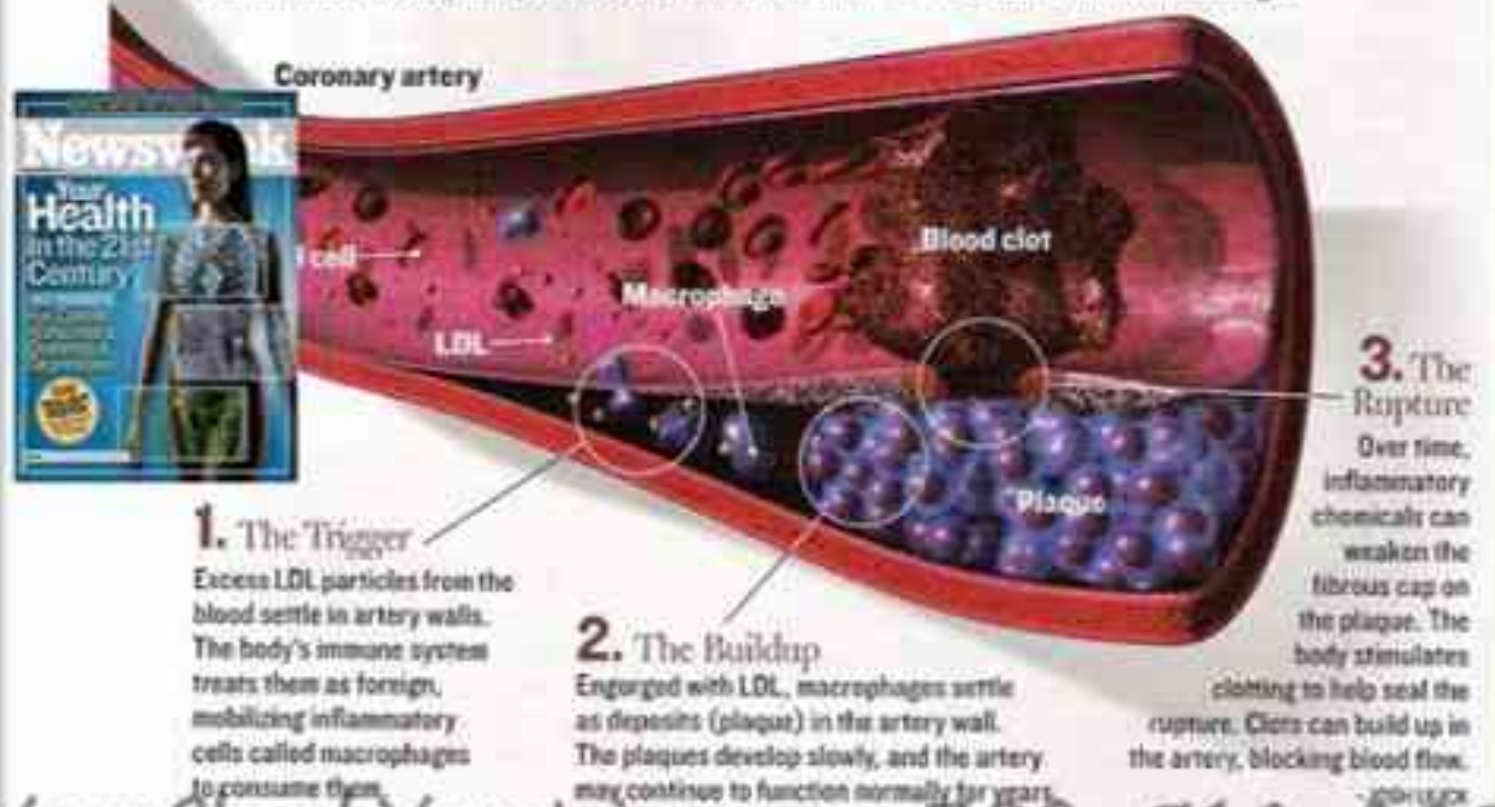
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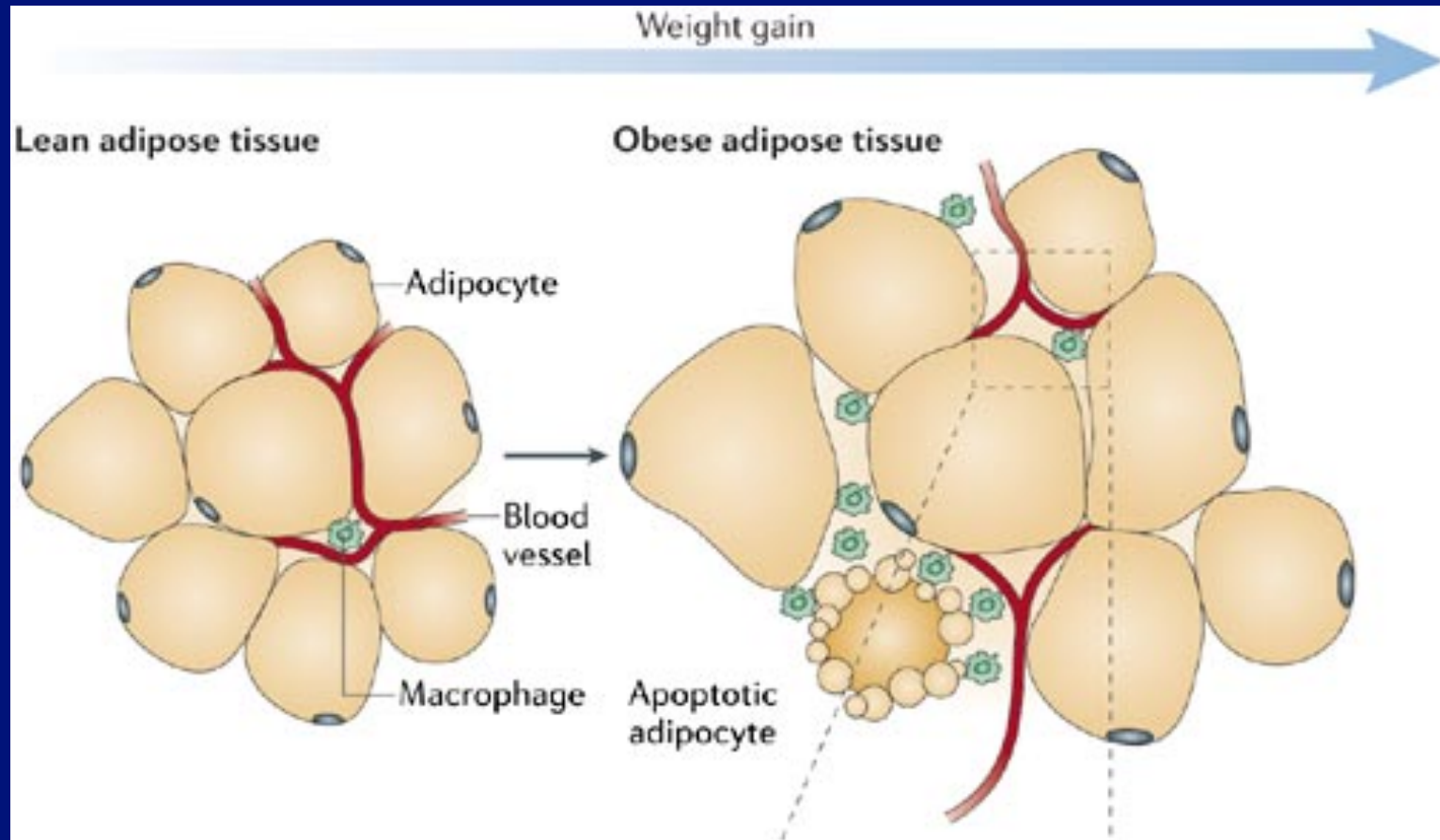


How Inflammation Causes Heart Disease

Doctors used to think that clogged arteries were caused by the passive buildup of bad cholesterol (LDL). As it turns out, the body's response to LDL, in the form of inflammation, causes most of the damage.



When Good Fat Turns Bad



How to Beat Inflammation

- Continue your HIV medications
- Stop smoking
- Maintain normal weight
- If overweight, lose at least 5-10% of body weight
- Exercise
- Have a healthy diet
- Cut down on alcohol, avoid drugs
- Get routine dental care

Conclusions

- HIV medications work well, so people are living longer
- You have a big role in how you are going to age
- Modify your modifiable risk factors
- Find disease early and try to reverse it

