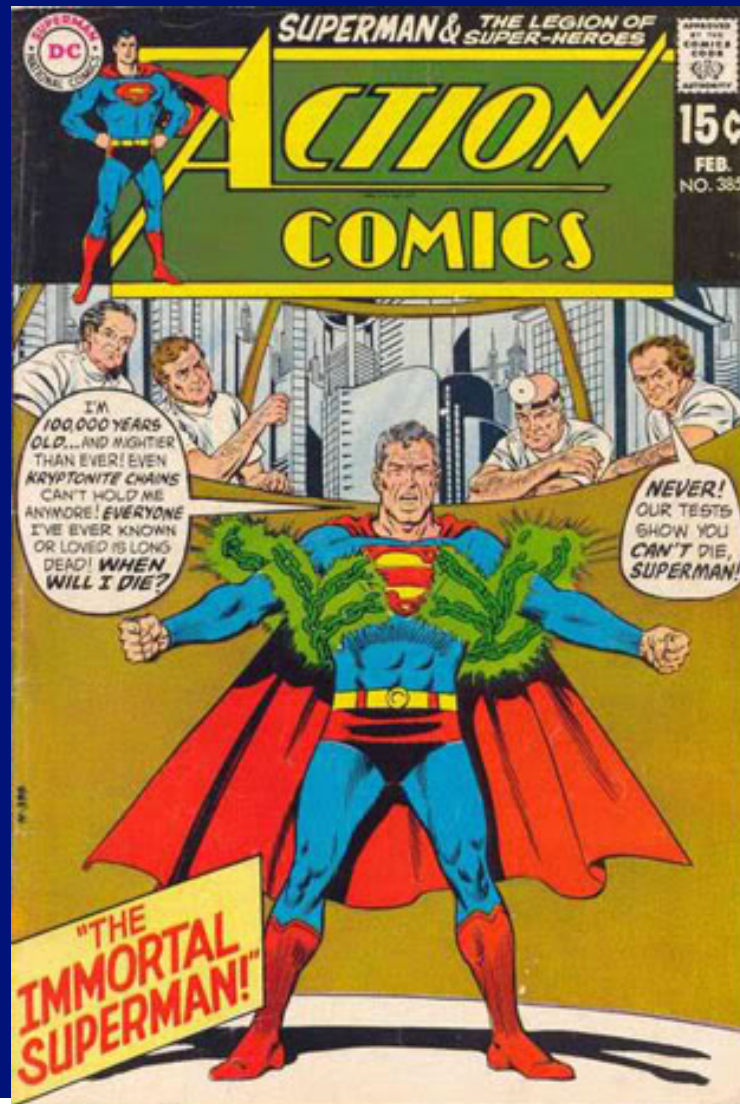


# Optimizing Health While Aging with HIV

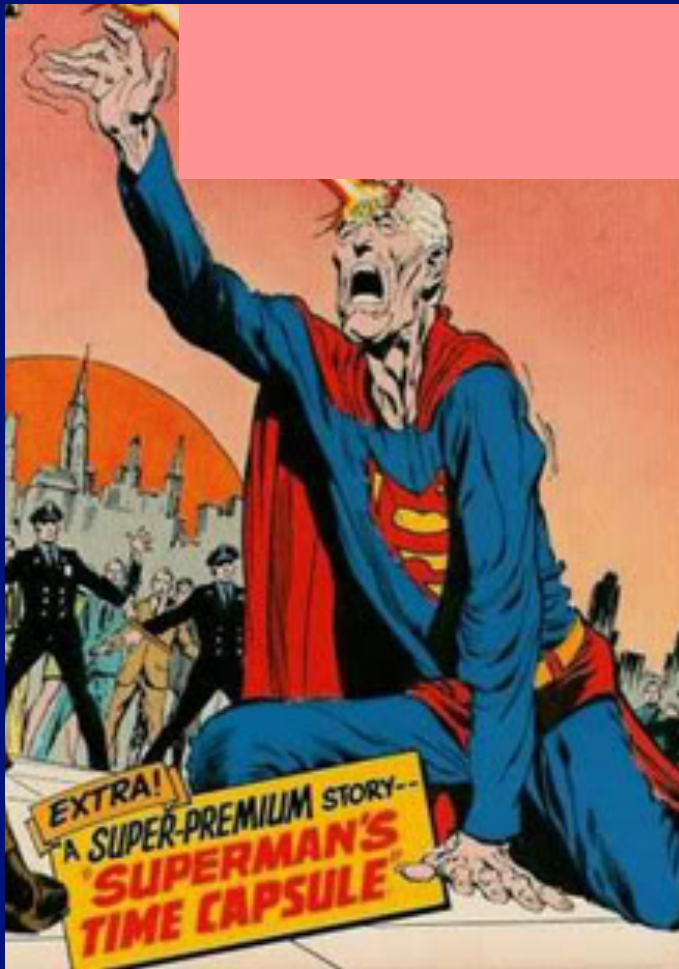


Todd T. Brown, MD, PhD  
Division of Endocrinology and Metabolism  
Johns Hopkins University

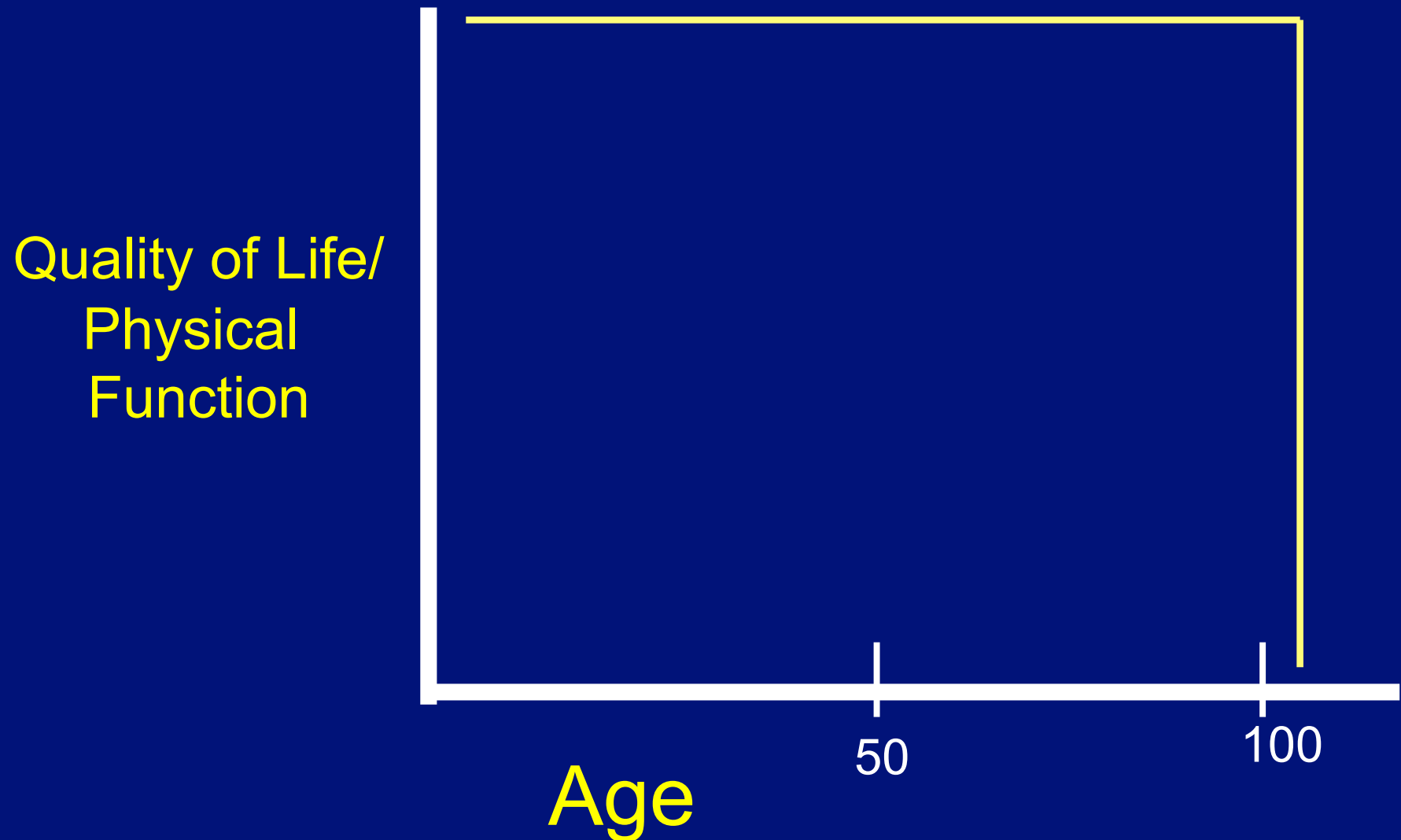
# Unfortunately, We are Not Immortal...



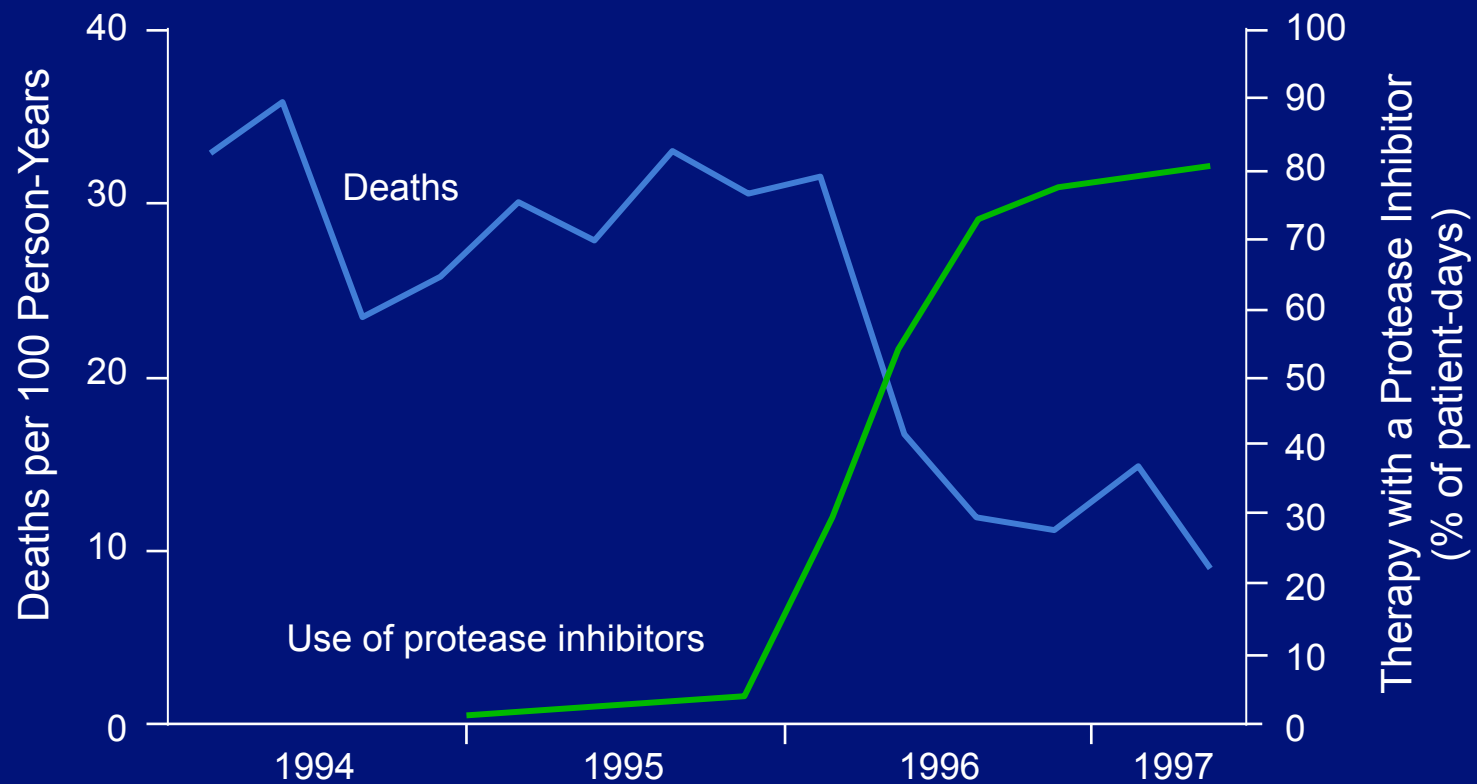
# But How Do We Want to Age?



# 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

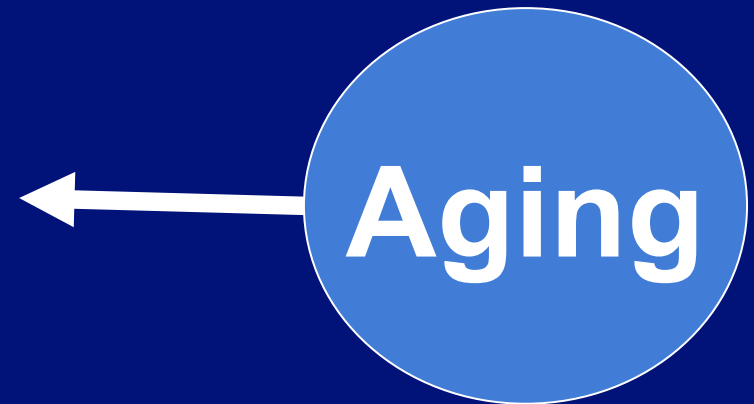


\*Data from 2008, onward projected based on 2001-2007 trends (calculated by author), 2001-2007 data from CDC Surveillance Reports 2007

Slide Courtesy of Amy Justice, MD, PhD

# Diseases more Common Among HIV-infected Persons

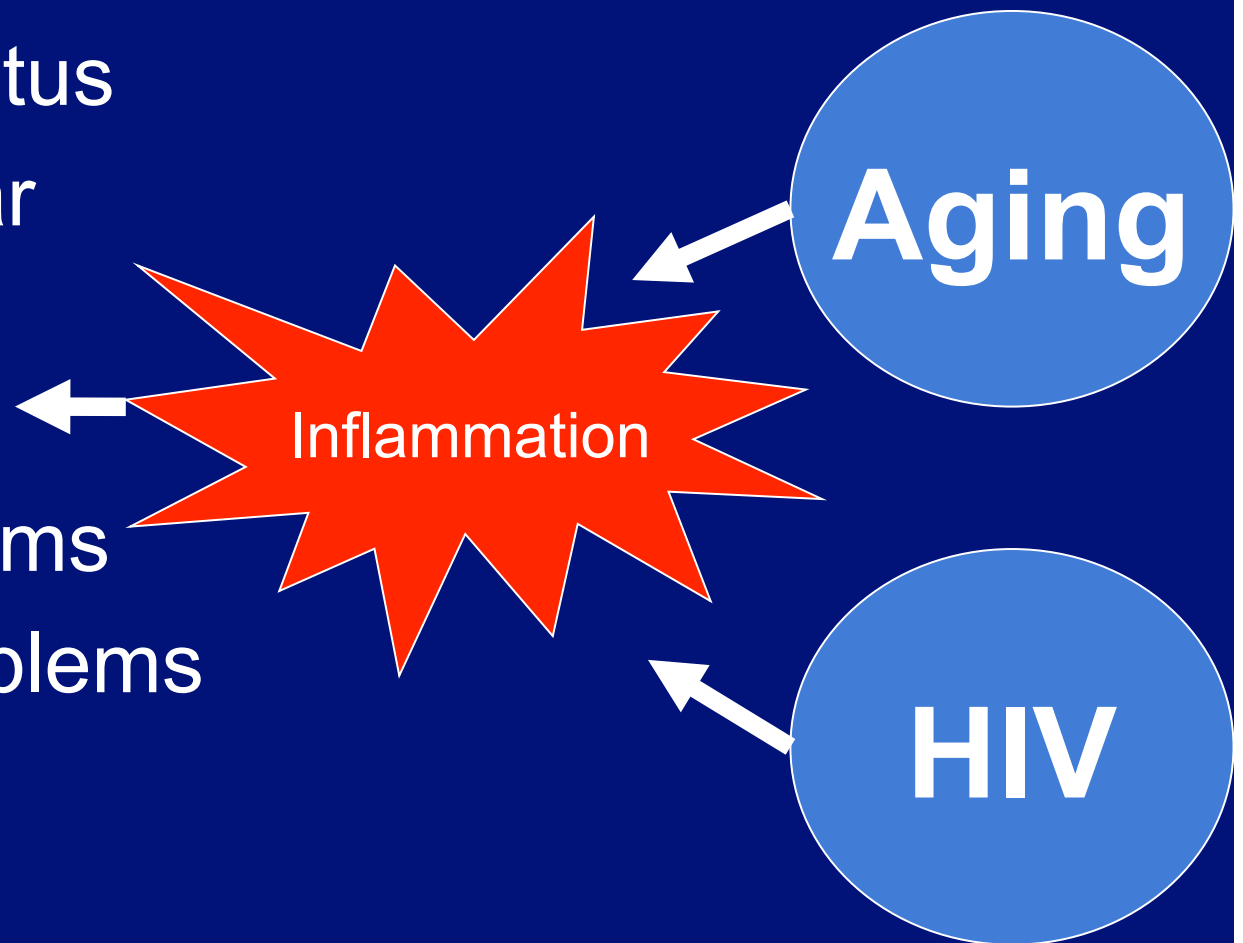
- Diabetes Mellitus
- Cardiovascular Disease
- Cancer
- Kidney Problems
- Cognitive Problems
- Osteoporosis



# Are HIV-infected Persons Aging Faster?

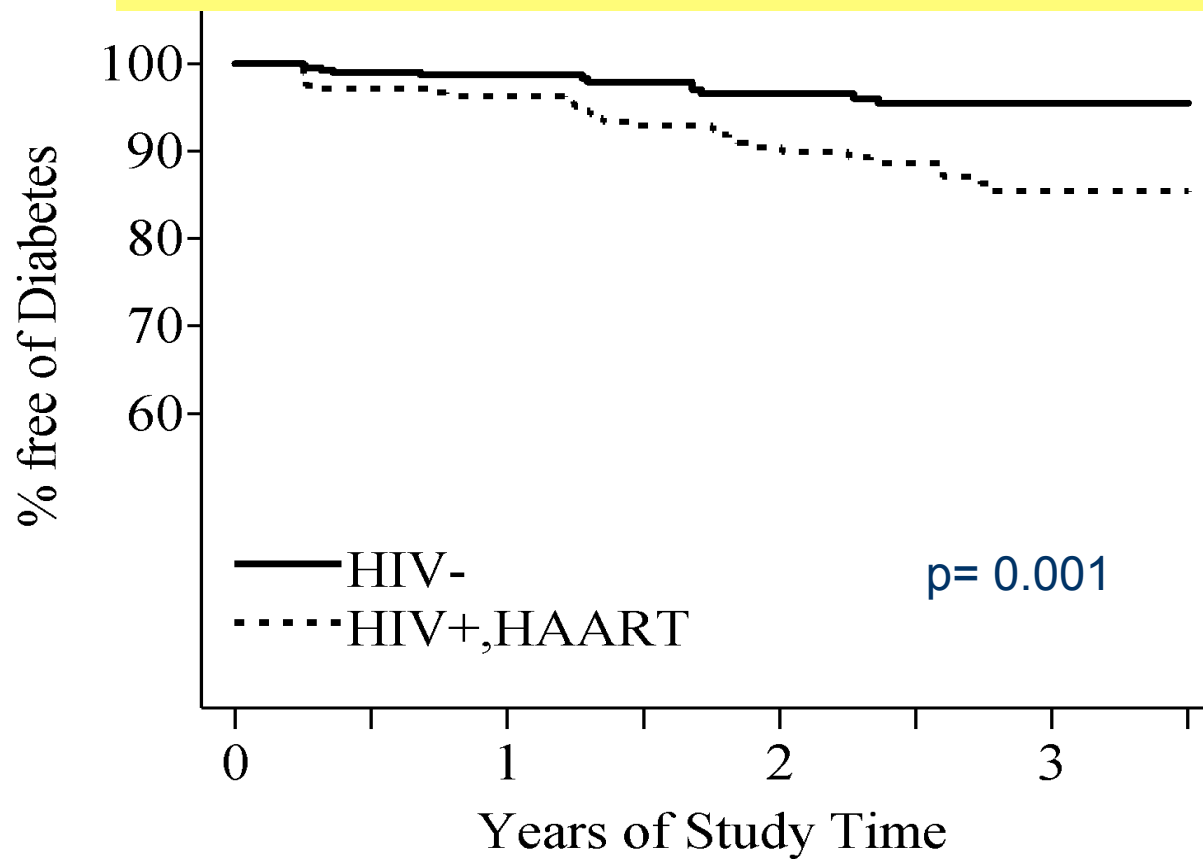
# Diseases more Common Among HIV-infected Persons

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



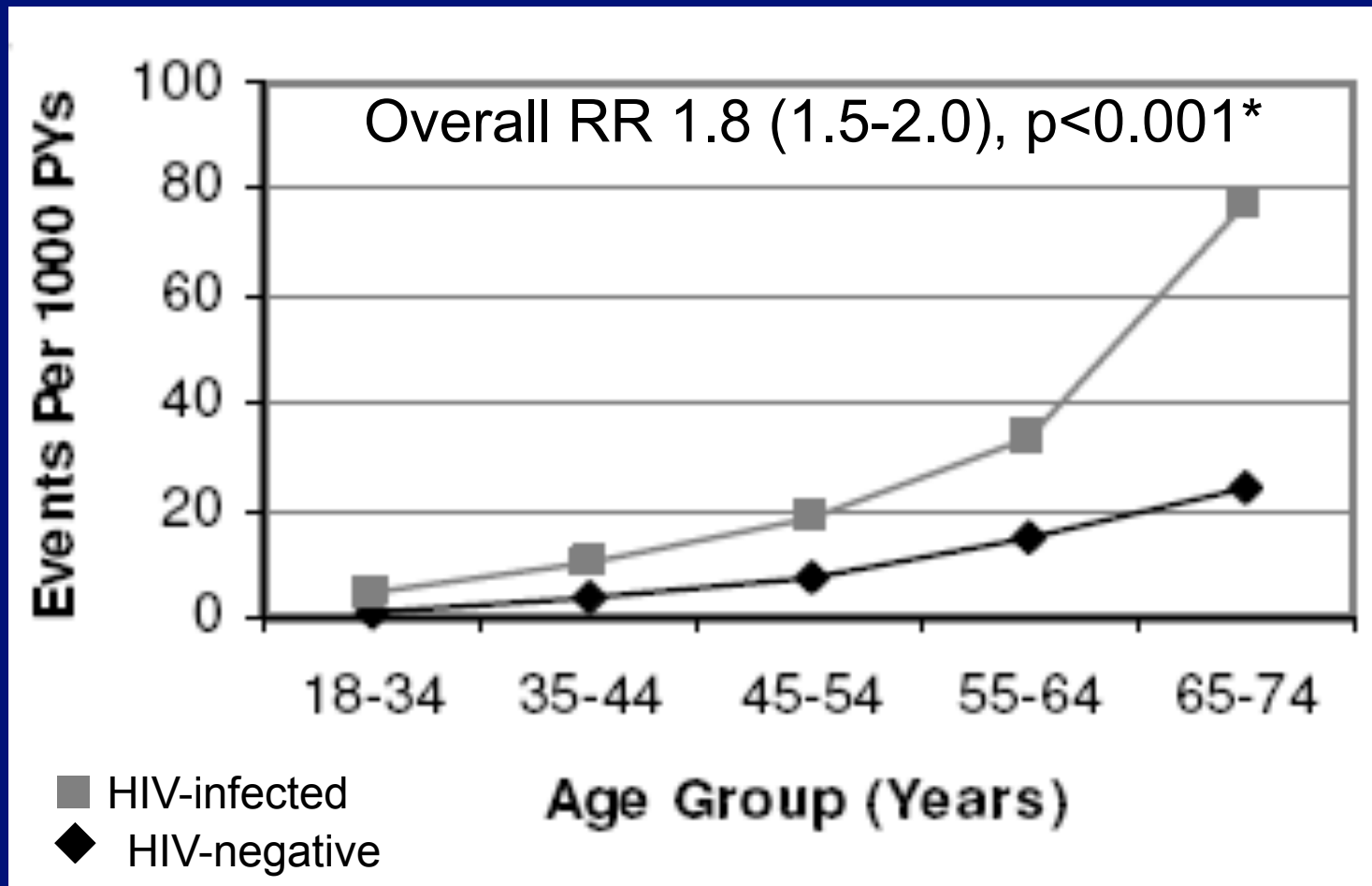
# Risk of Incident Diabetes Mellitus in the Multicenter AIDS Cohort Study (1999-2003)

4 fold increased risk of DM in HAART-treated men



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

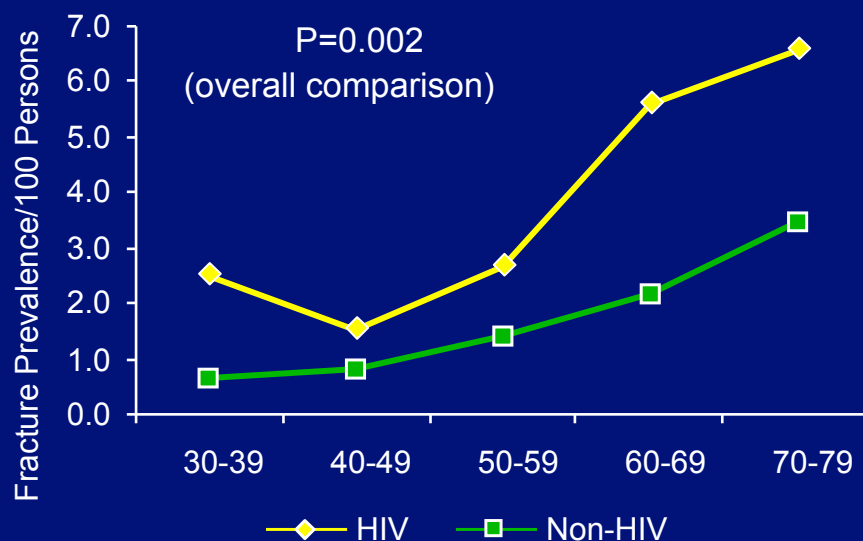
# Myocardial Infarction in HIV-infected and uninfected Patients: MGH Study



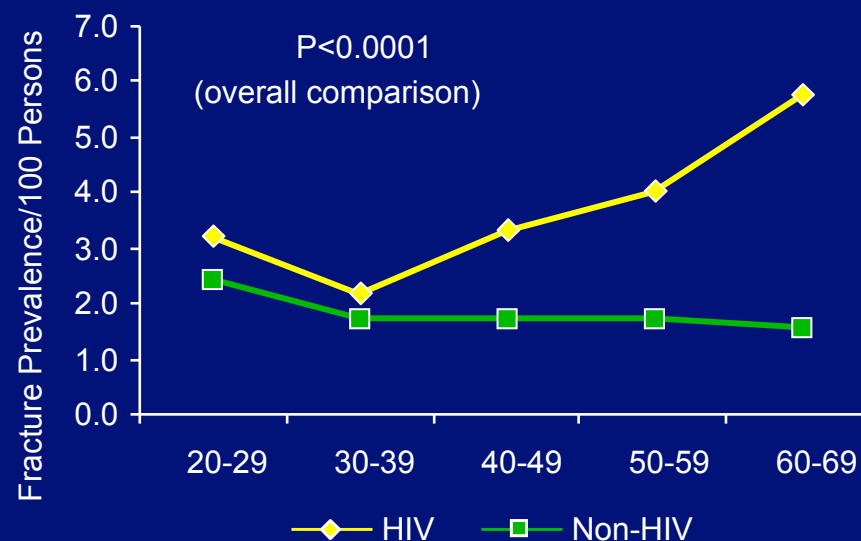
\*adjusted for age, gender, race, HTN, DM, dyslipidemia

Triant, JCEM, 2007

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



Women



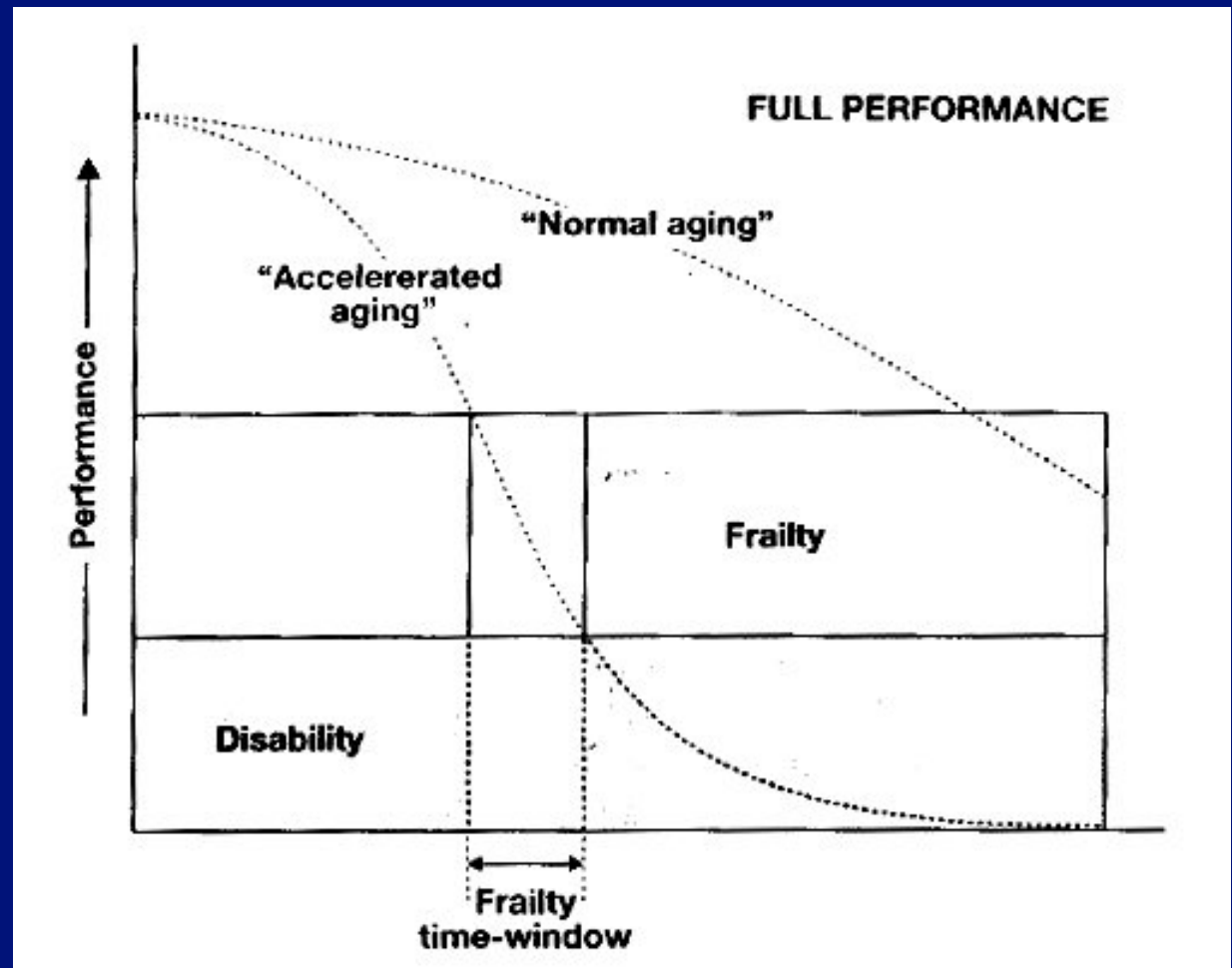
Men

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

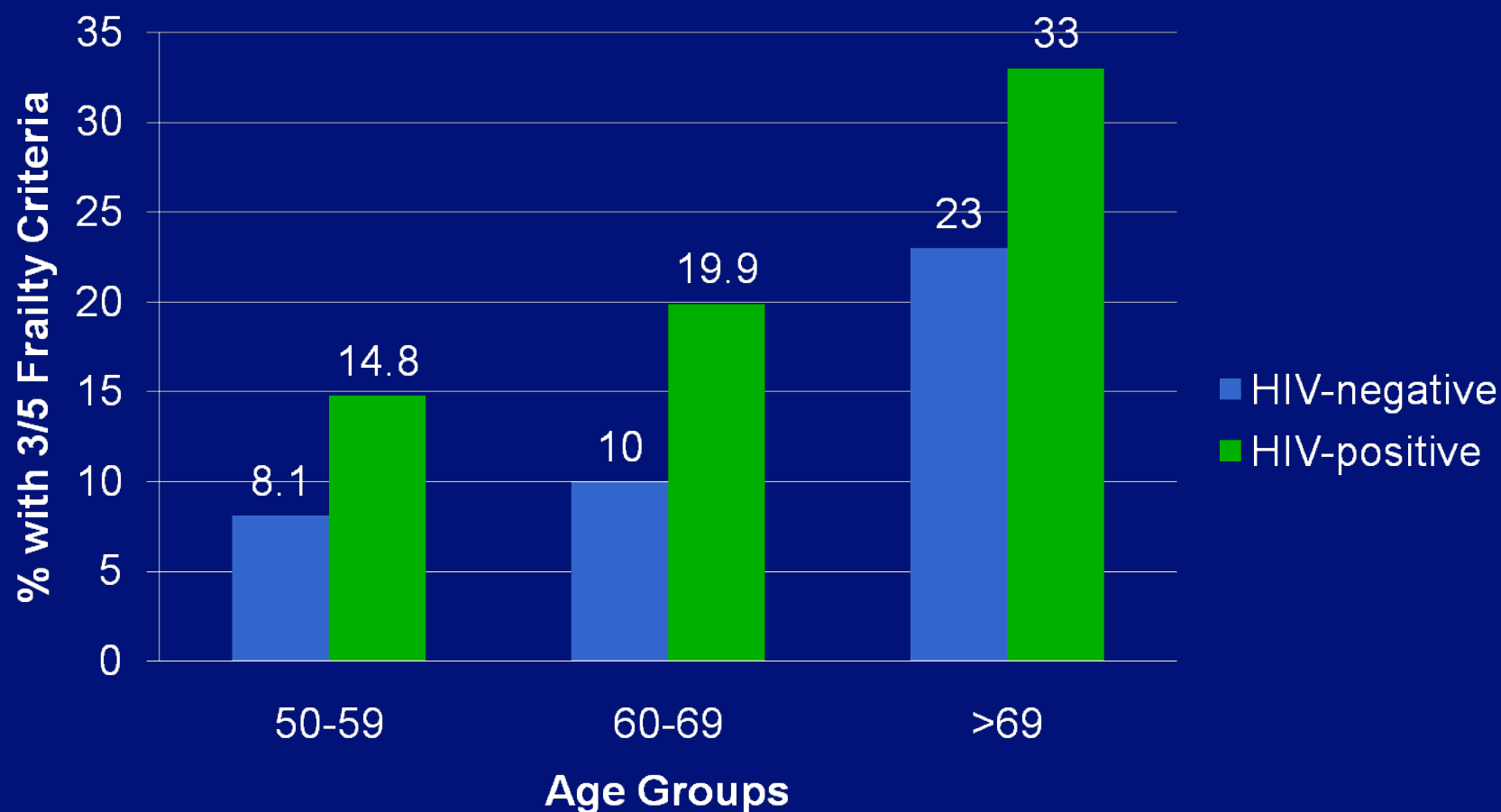
# Frailty: A Brief Overview

Slide 13

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



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

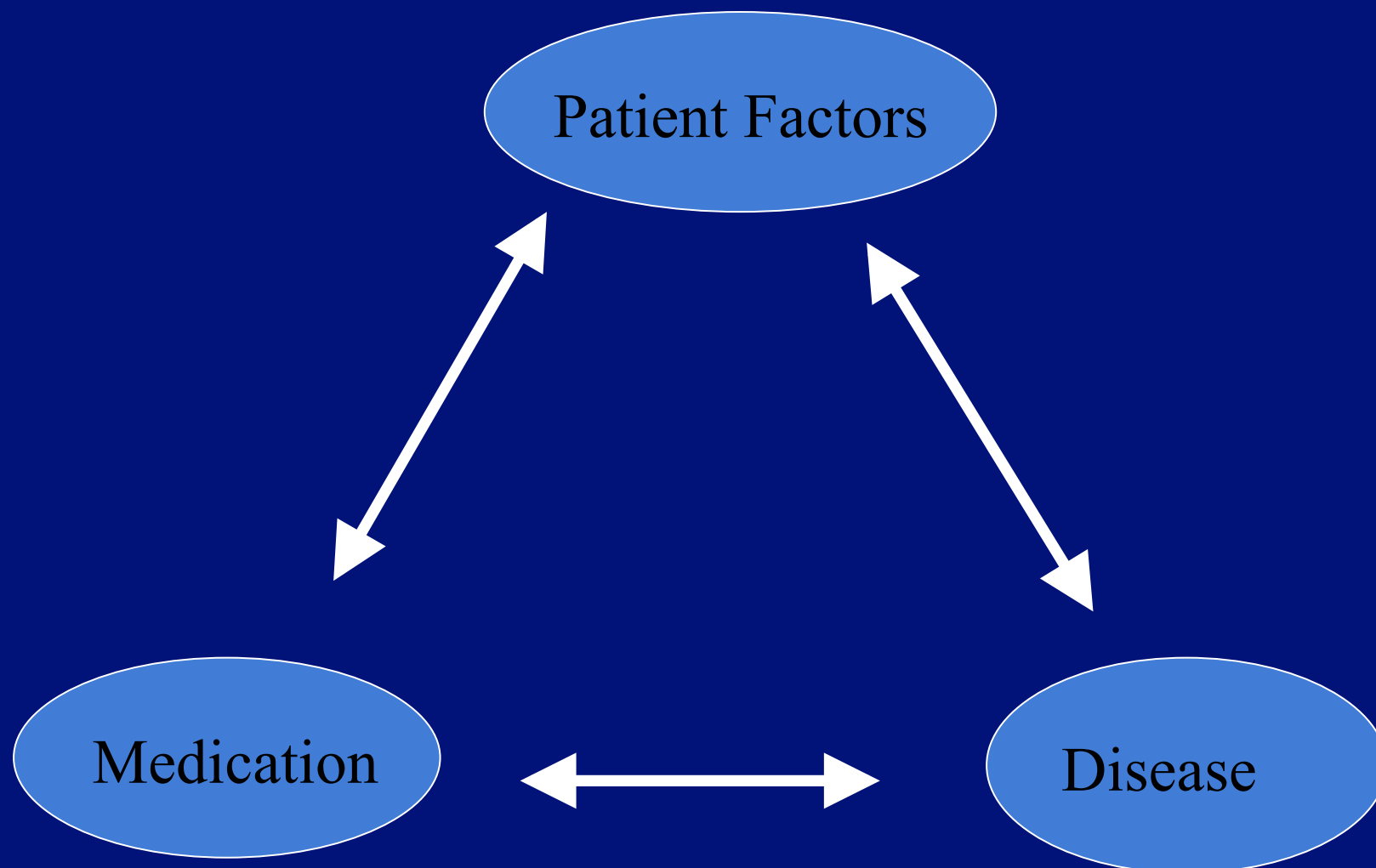


Margolick, CROI, 2011

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)

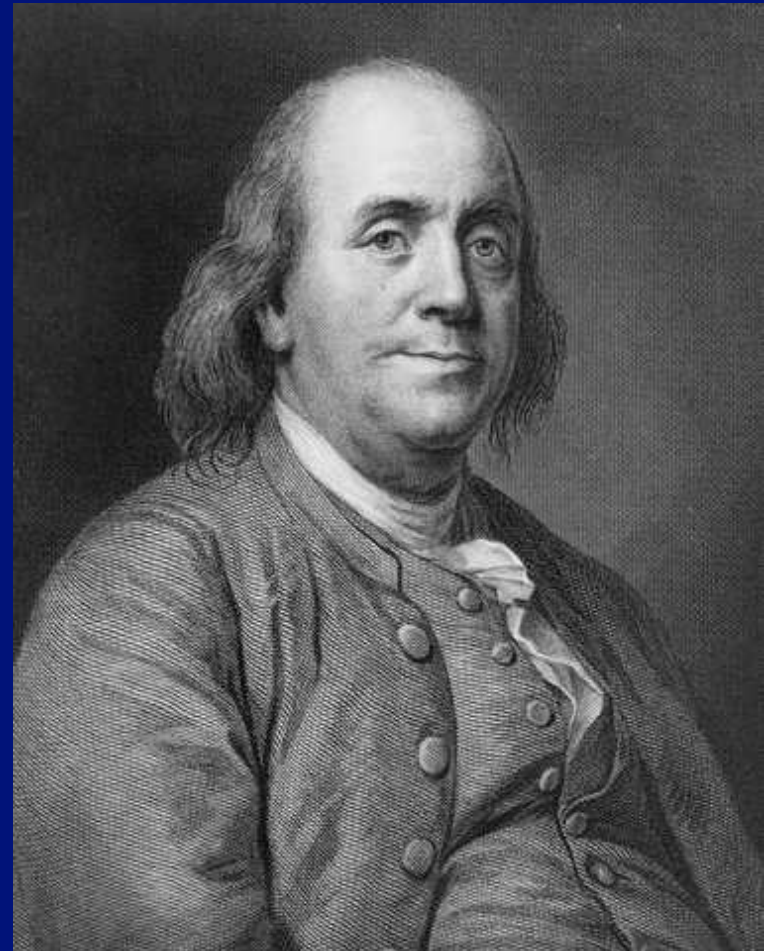
## Modifiable

(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

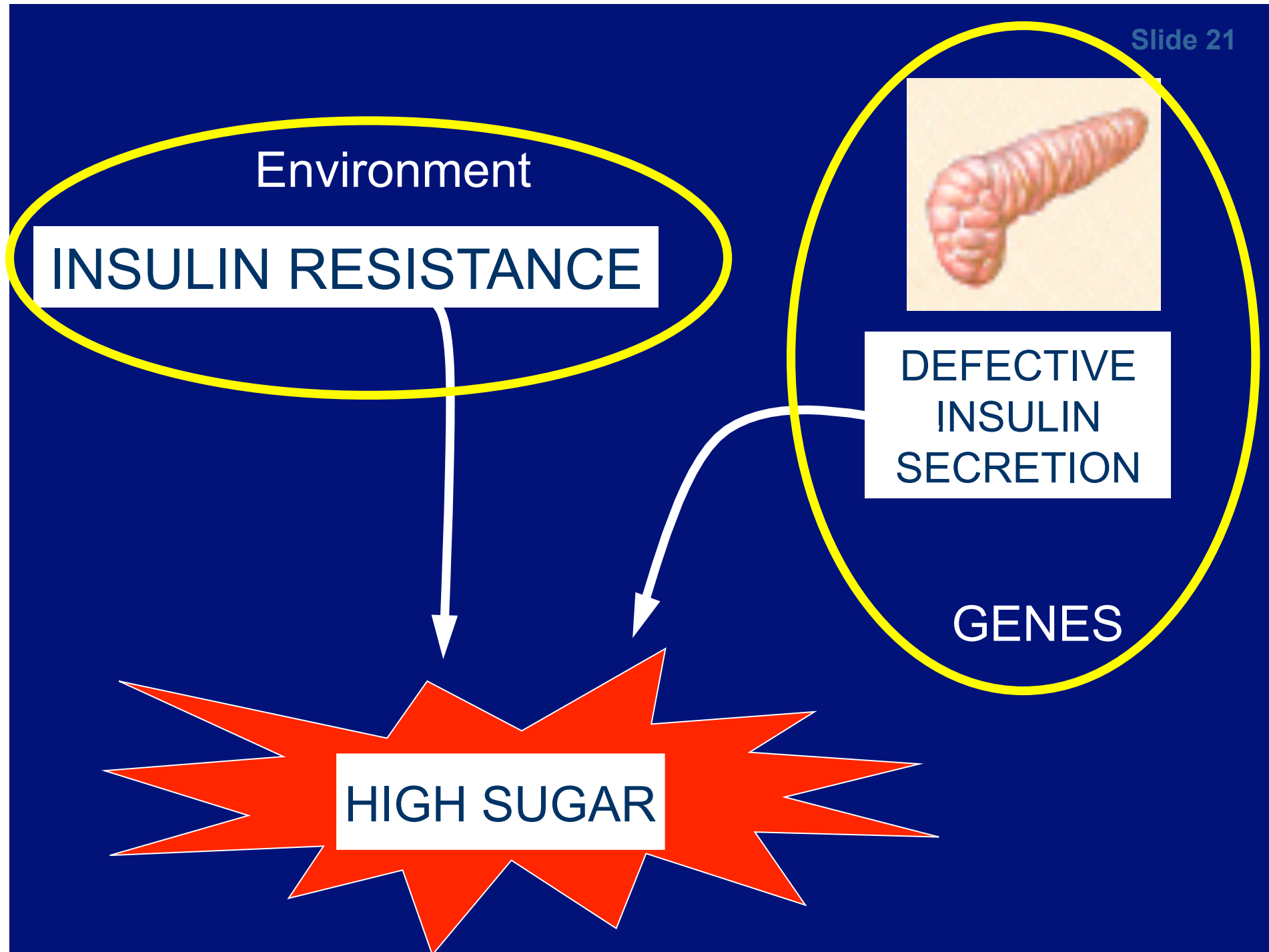
INSULIN RESISTANCE



DEFECTIVE  
INSULIN  
SECRETION

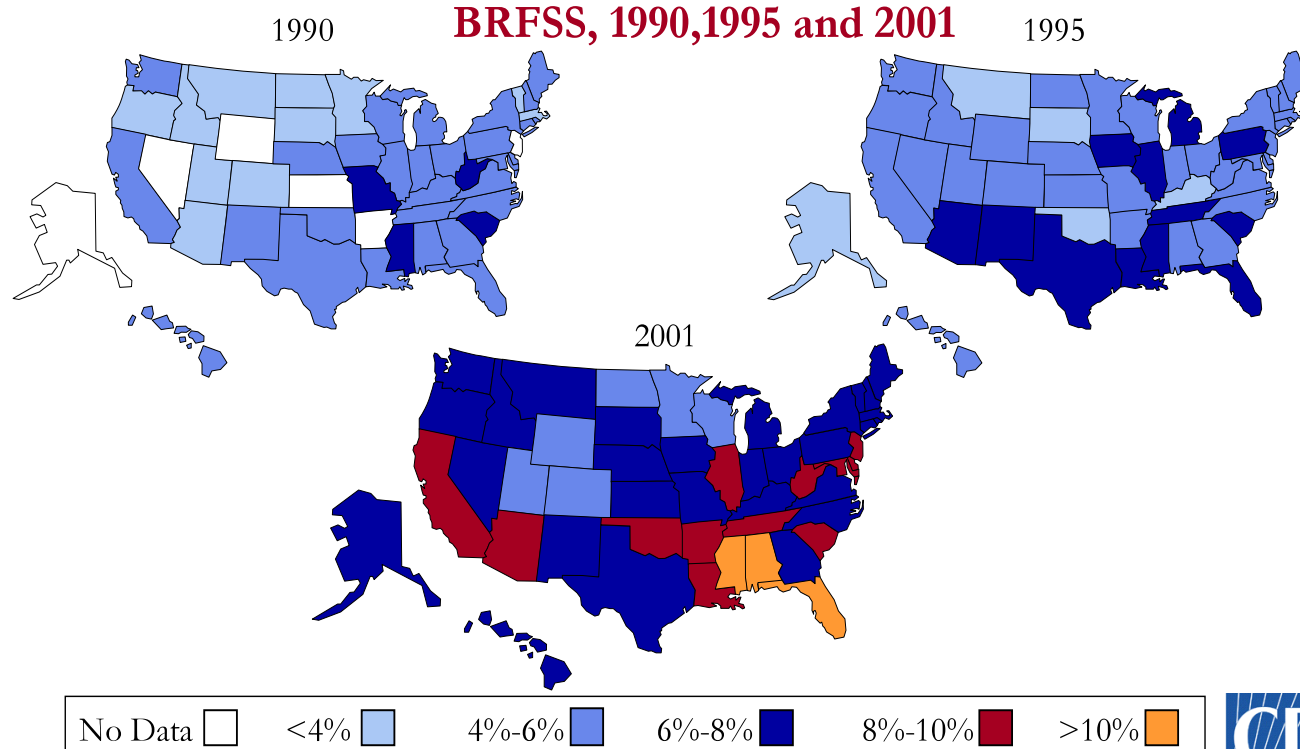
GENES

HIGH SUGAR



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

**BRFSS, 1990,1995 and 2001**



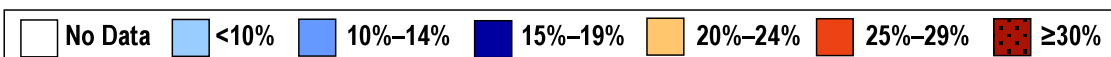
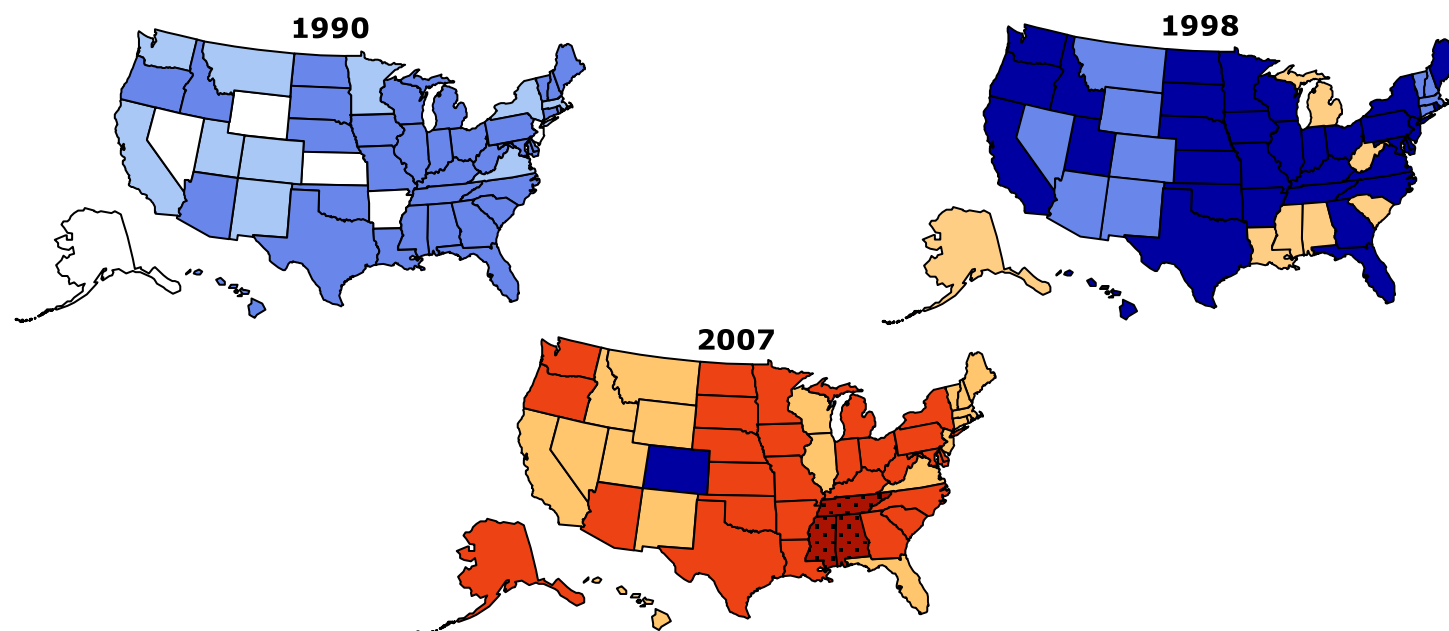
Source: Mokdad et al., *Diabetes Care* 2000;23:1278-83; *J Am Med Assoc* 2001;286:10.



## Obesity Trends\* Among U.S. Adults

**BRFSS, 1990, 1998, 2007**

(\*BMI  $\geq 30$ , 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 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.

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# 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

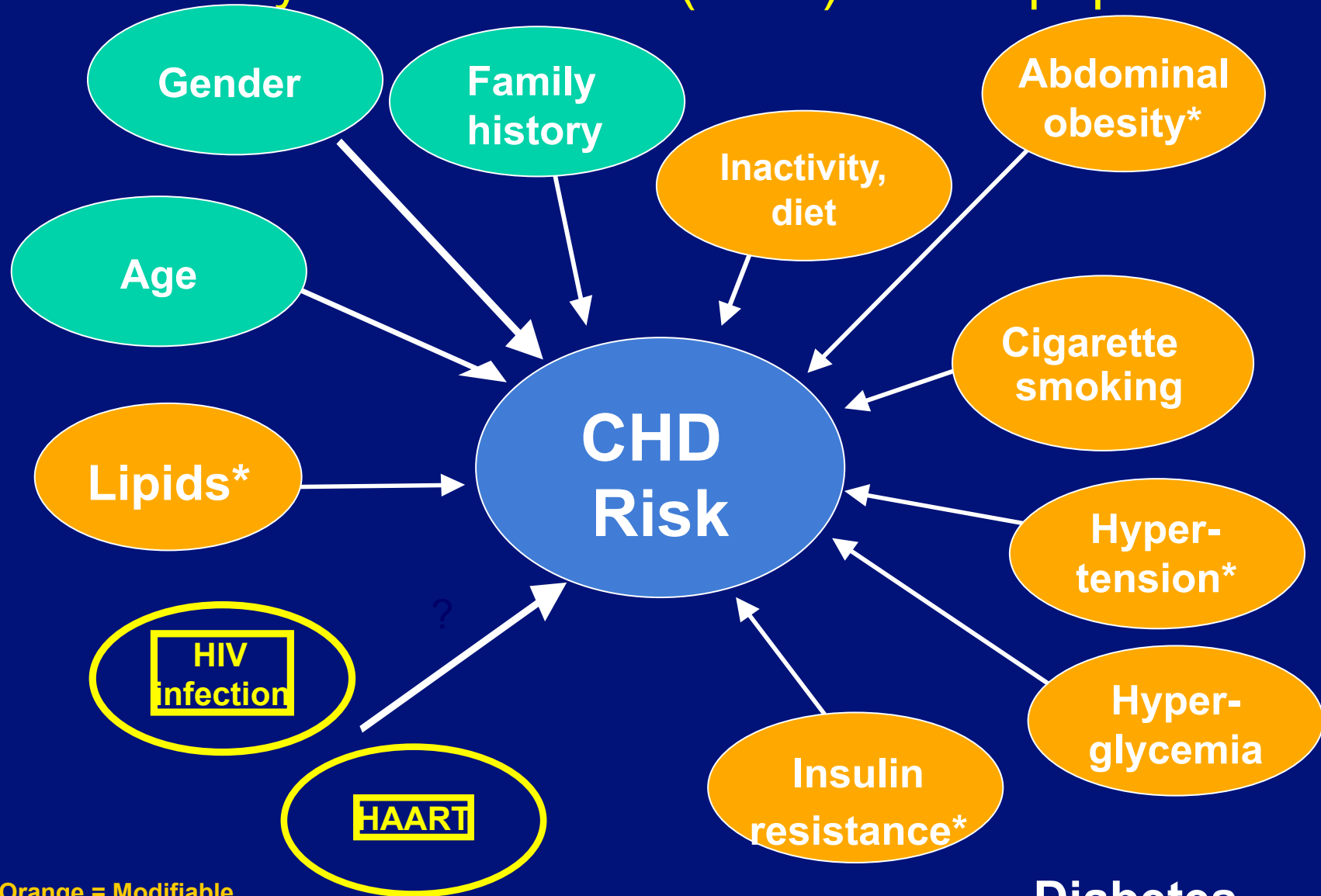
- Cutting 500 calories per day will decrease your weight by 1-2 lbs week
- Watch portion sizes
- Watch liquid calories (soda, juice, fruit drinks)
- Go natural
  - Avoid foods in boxes and cans (less salt and preservatives)
  - Maximize fresh fruits and vegetables
  - Mediterranean Diet as an example

# Lifestyle Modification: Exercise

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

- 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

Slide 36

**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        |
| <b>Risk Score*</b>       | 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:<br>may be able<br>to switch ART | Low fat diet,<br>weight loss,<br>niacin, fish oil,<br>fibrate |
| HDL               | > 40 in men,<br>> 50 in women | “H”: Happy cholesterol                            | Low, but<br>increases with<br>ART          | Exercise,<br>niacin                                           |
| LDL               | <100 or <130                  | •“L”: Lousy cholesterol<br>•Most important target | Higher with<br>certain HIV<br>meds         | Statins                                                       |

# The “ABCDs” of Cardiovascular Disease Management

---

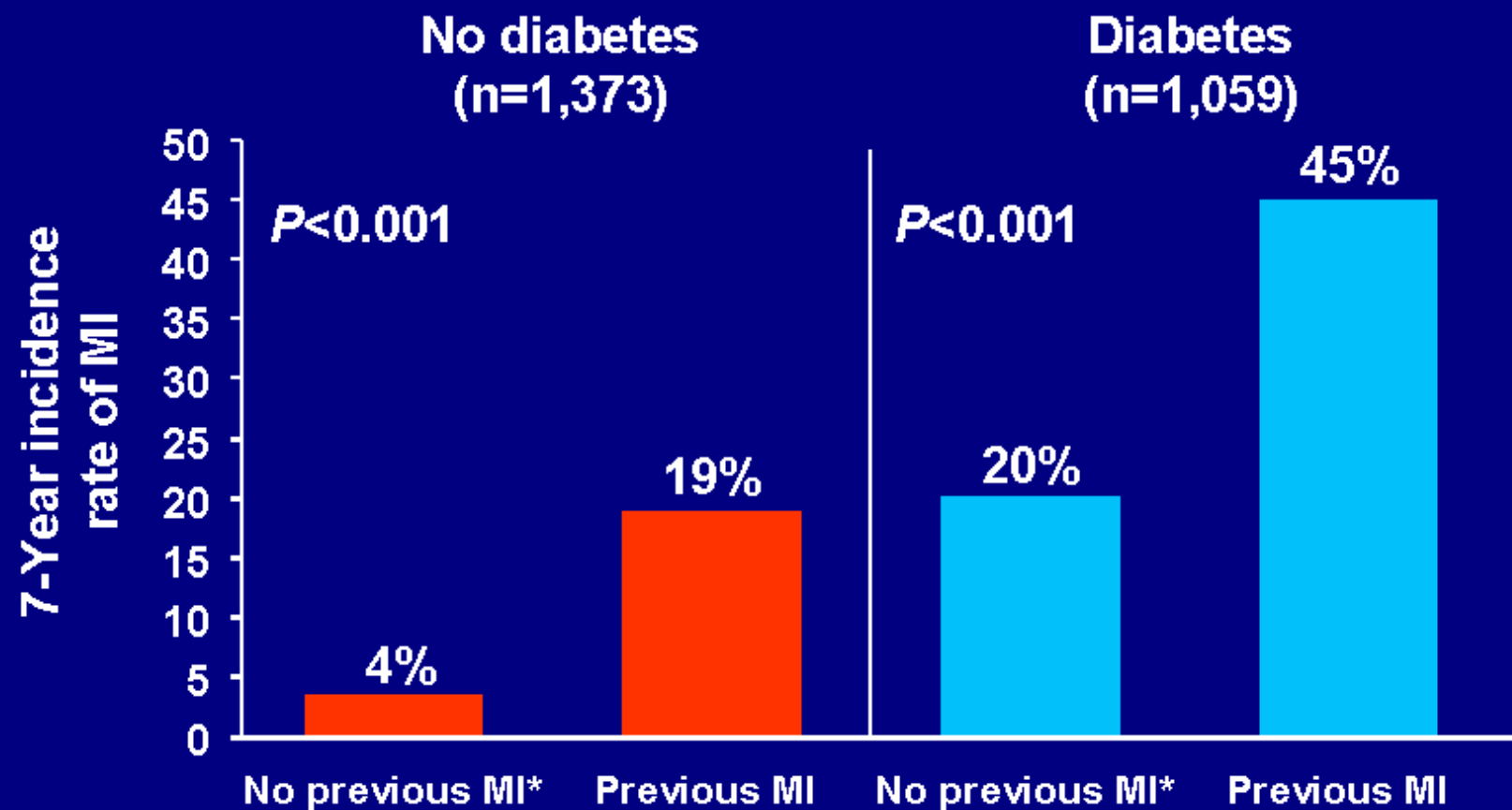
A: Aspirin

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

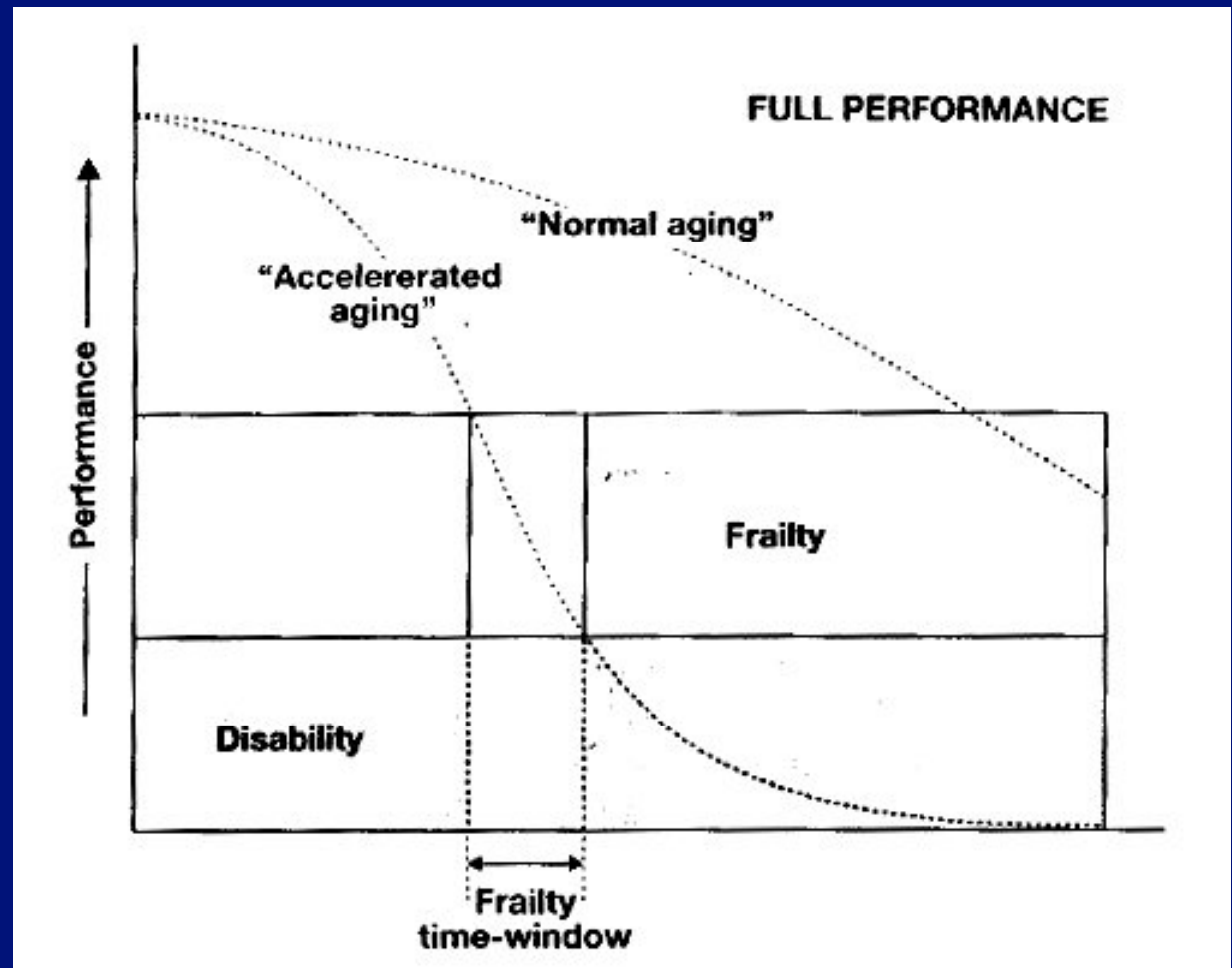
# How to Avoid Osteoporosis

- 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

# Frailty: A Brief Overview

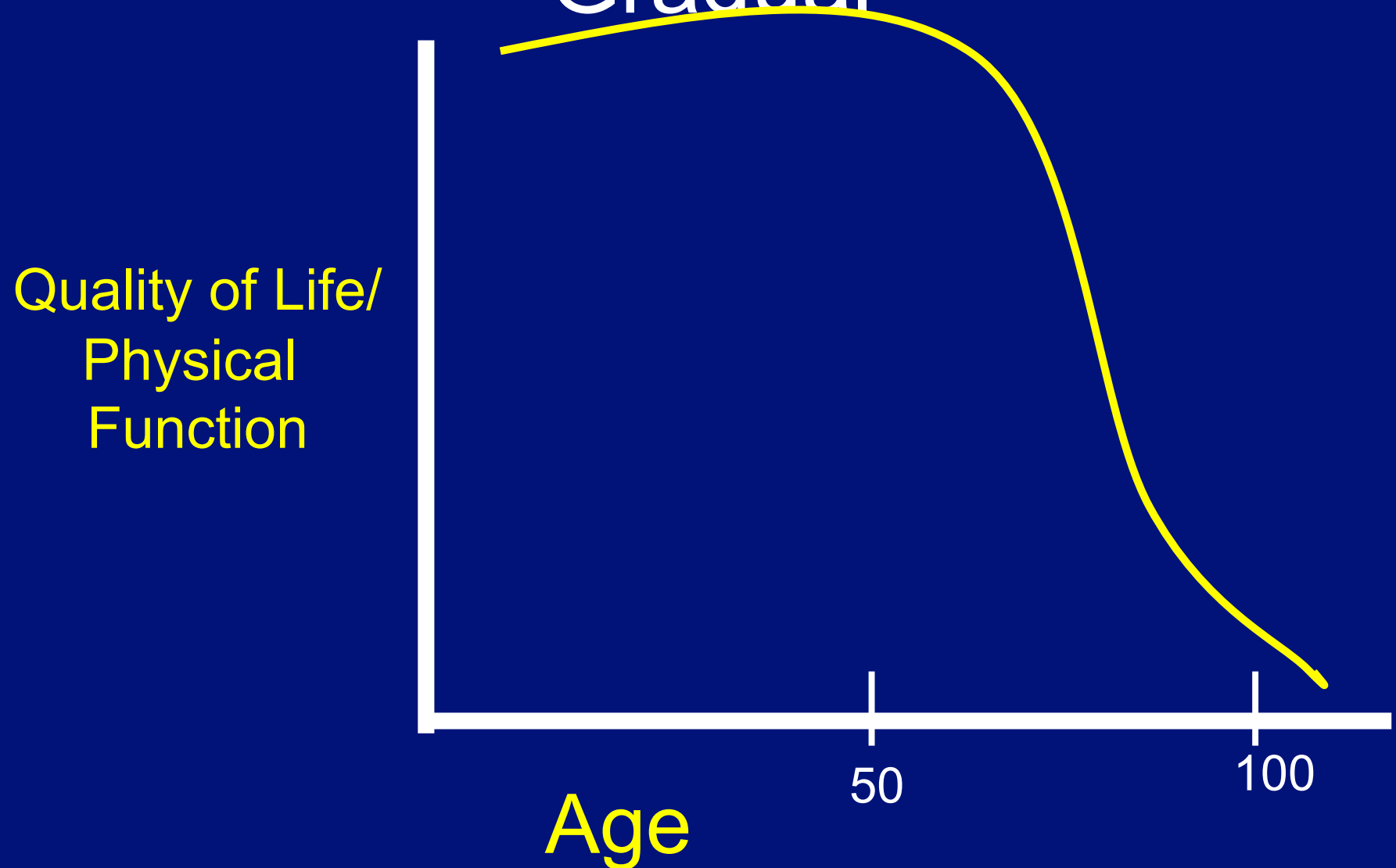
Slide 53

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

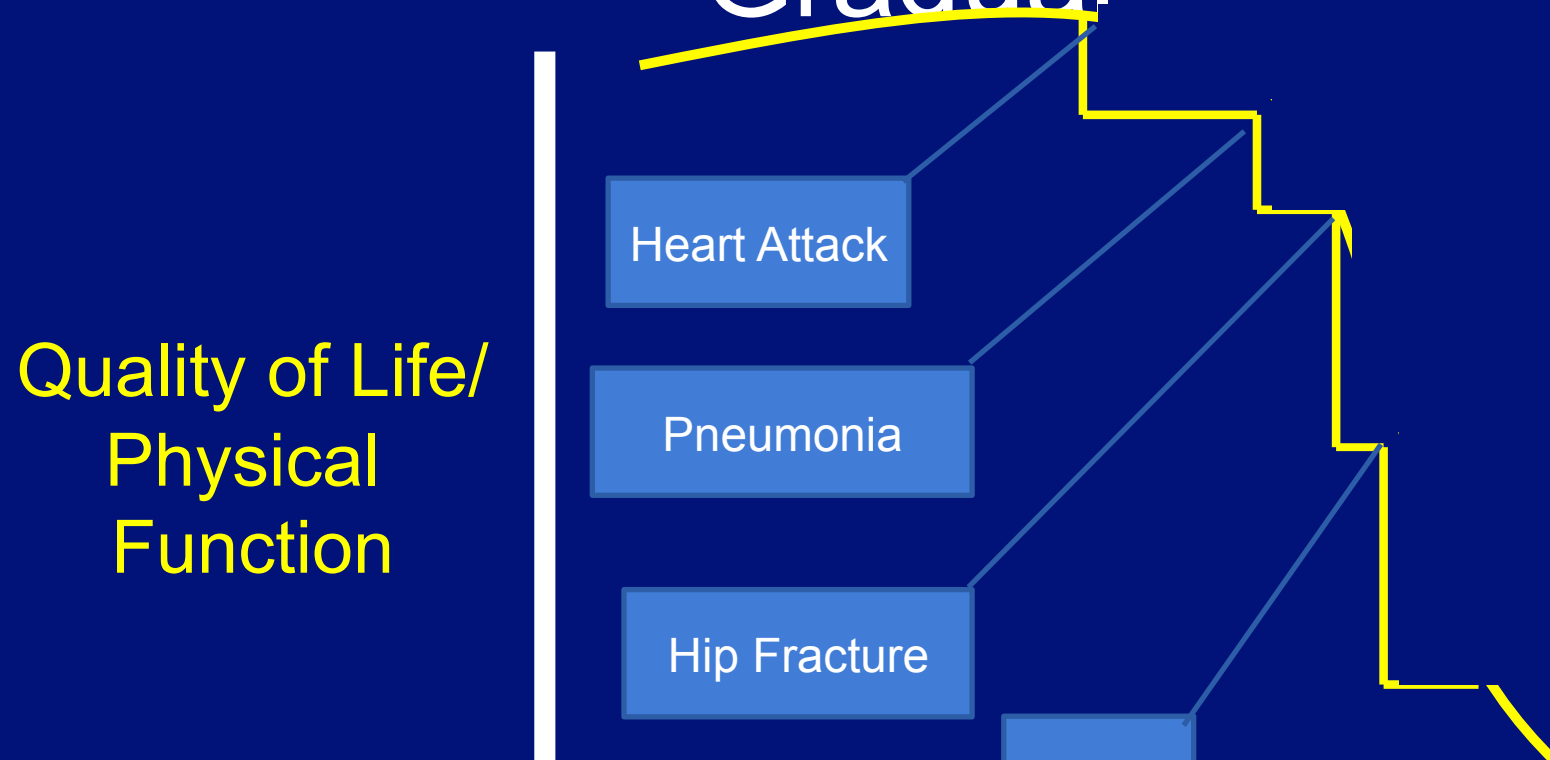


# Decline in Function May Not Be Gradual

Slide 54



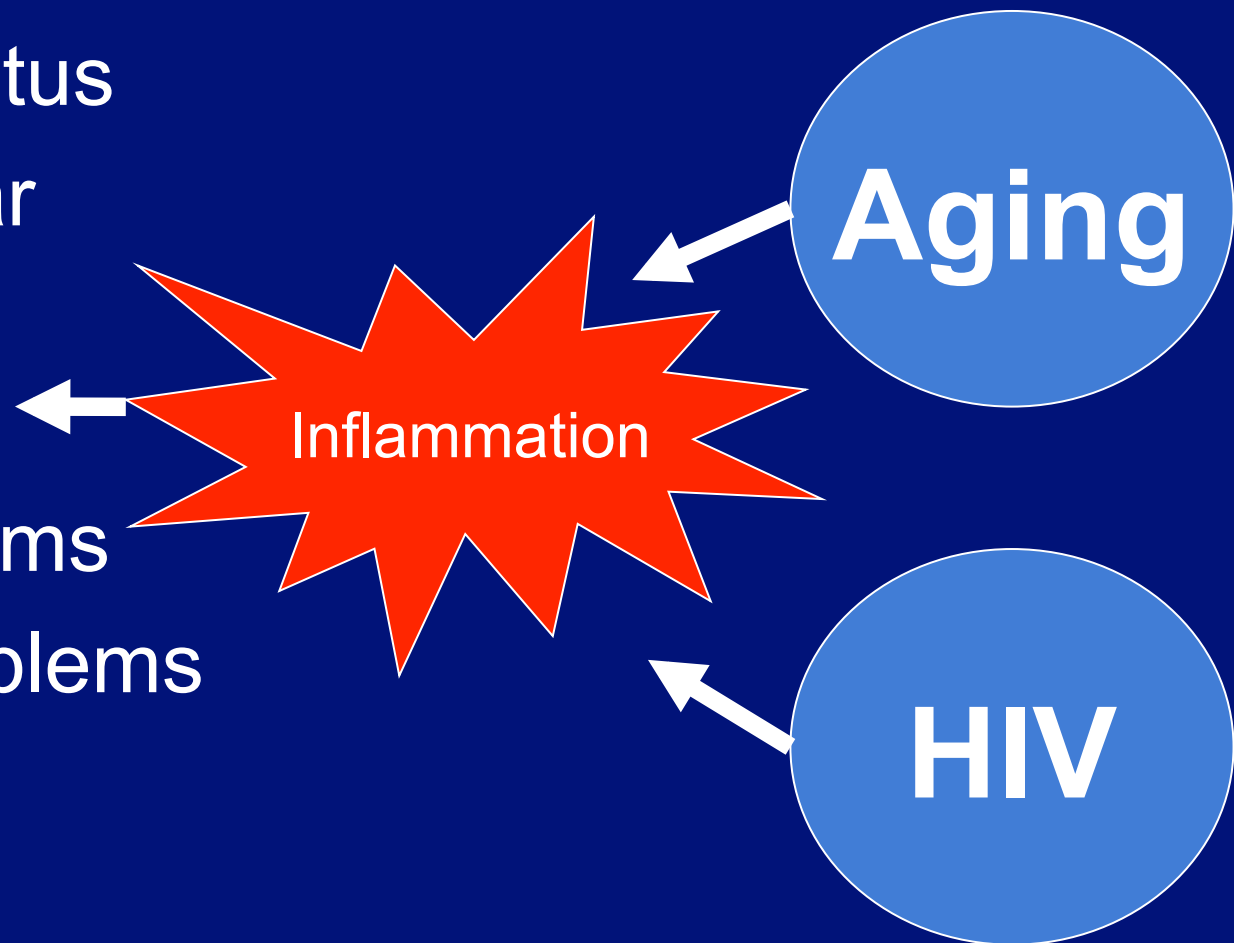
# Decline in Function May Not Be Gradual



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

# Important Role of Inflammation

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



# 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



# 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