

Aging with HIV

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Aging with HIV

- Increased life expectancy on ARVs. However, life expectancies still shorter than for general population
 - Especially for low CD4 and/or salvage regimens
- What is the impact of increased life expectancy on comorbidity prevalence ?
- The impact of increased comorbidity on
 - Timing of ARV initiation
 - Appropriateness of primary care practice guidelines (e.g., colorectal cancer screening). No systematic method to predict whether guidelines developed on general population should apply to individuals with HIV

Aging and HIV

- ART may produce chronic adverse effects
 - CHD risk increased
 - Metabolic abnormalities more common
- ART may not protect from CANCER with AGE
 - Esophageal / Lung / Rectal (HPV) / Renal / Liver
- Conditions seen at earlier age
 - Osteoporosis/ hypogonadism

Age Disproportionately Affects Care Resources

- 80% have at least one chronic disease
- Most common conditions
 - Arthritis, hypertension, hearing impairment, heart disease, vision impairment, orthopedic disabilities, diabetes
- The elderly make up 13% of the population but
 - utilize 30% of the prescription drugs
 - 40% of the OTC medications
- On average the elderly take 3 times more drugs than younger counterparts
- The elderly suffer 2-3 times the rate of adverse drug reactions
 - Most explainable to changes in renal and hepatic function and changes in body composition

Payoff Time

- ***Payoff Time = Minimum time until incremental benefits > incremental harms***
 - Applies to any guideline where harms are short-term and benefits are long-term
 - Colorectal cancer screening (CRC)
 - Will vary by guideline and by patient population
- Payoff time can be compared to life expectancy
 - If death likely before payoff time, guideline not advised
 - If death unlikely before payoff time, guideline advised

Compare payoff time to life expectancy

Case 1: 60 year-old HIV+ male on salvage ARV, CD4 count 46 severe COPD and HCV

- Payoff time for Case 1 is 7.3 years
- Life Expectancy for Case 1 is 5.1 years
- Because life expectancy is less than payoff time (minimum time until benefits exceed harms), Case 1 is unlikely to benefit from colorectal cancer screening

Compare payoff time to life expectancy

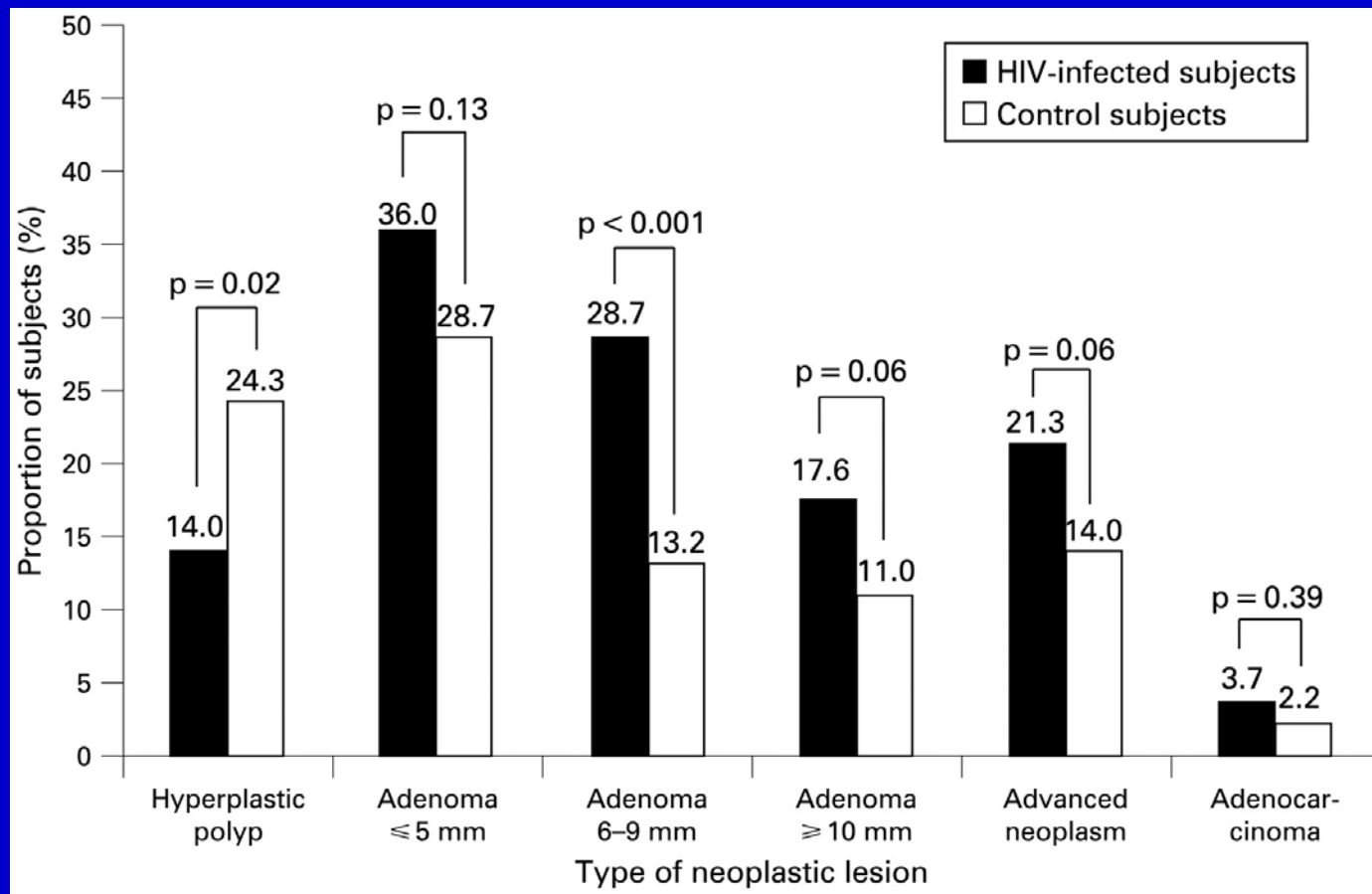
Case 2: 60 year-old HIV+ female on 1st line ARV, CD4 count 392, DM

- Payoff time for Case 2 is 5.7 years
- Life Expectancy for Case 2 is 15.1 years
- Because life expectancy is more than payoff time (minimum time until benefits exceed harms), Case 2 is likely to benefit from colorectal cancer screening

Braithwaite Conclusion

- Payoff time is quantitative objective framework for predicting who will benefit
- CRC screening may not always be appropriate for HIV+ individuals
 - Low CD4
 - Salvage ARV
- May simultaneously improve quality of care and reduce resource expenditures
- May impact quality measures

Figure 1 Prevalence of neoplastic lesions in the HIV-infected subjects and control subjects. Note: These categories are not mutually exclusive since advanced neoplasia includes all patients with adenomas ≥ 10 mm, those with adenomas of any size with villous histology or high-grade dysplasia, and individuals with adenocarcinoma.



Bini, E J et al. Gut 2009;58:1129-1134

Prostate Cancer: Risk?

- Association between HIV status and positive prostate biopsy in a study of US veterans (Atlanta)
 - Over a 5.5 year period, patients referred to the urology clinic (elevated PSA or abnormal DRE): markedly higher rate of prostate cancer in HIV patients when compared to HIV-negative or HIV-unknown population

Hsiao W, *Scientific World J.* 2009 Feb 15;9:102-8

- In men receiving HAART, their age, PSA levels, clinical presentation, management, and outcome from treated prostate carcinoma does not appear to be significantly altered by HIV status.

Pantanowitz L, *BJU Int.* 2008 June

Geriatric Periodic Health Exam

- An assessment that is aimed at preventing, detecting and controlling specific conditions or risk factors
- The GPHE specifically addresses those over age 65 and allows detection of the common health issues that require further assessment and/or early intervention
- Targets conditions like frailty, sensory loss, cognitive impairment, depression, polypharmacy among others
- Opportunity for screening for “risky” behaviors (smoking, obesity, nutrition, medications)
- Self administered. Initial screen takes less than 30 minutes

GPHE Summary of Benefits from Chronic Disease Management

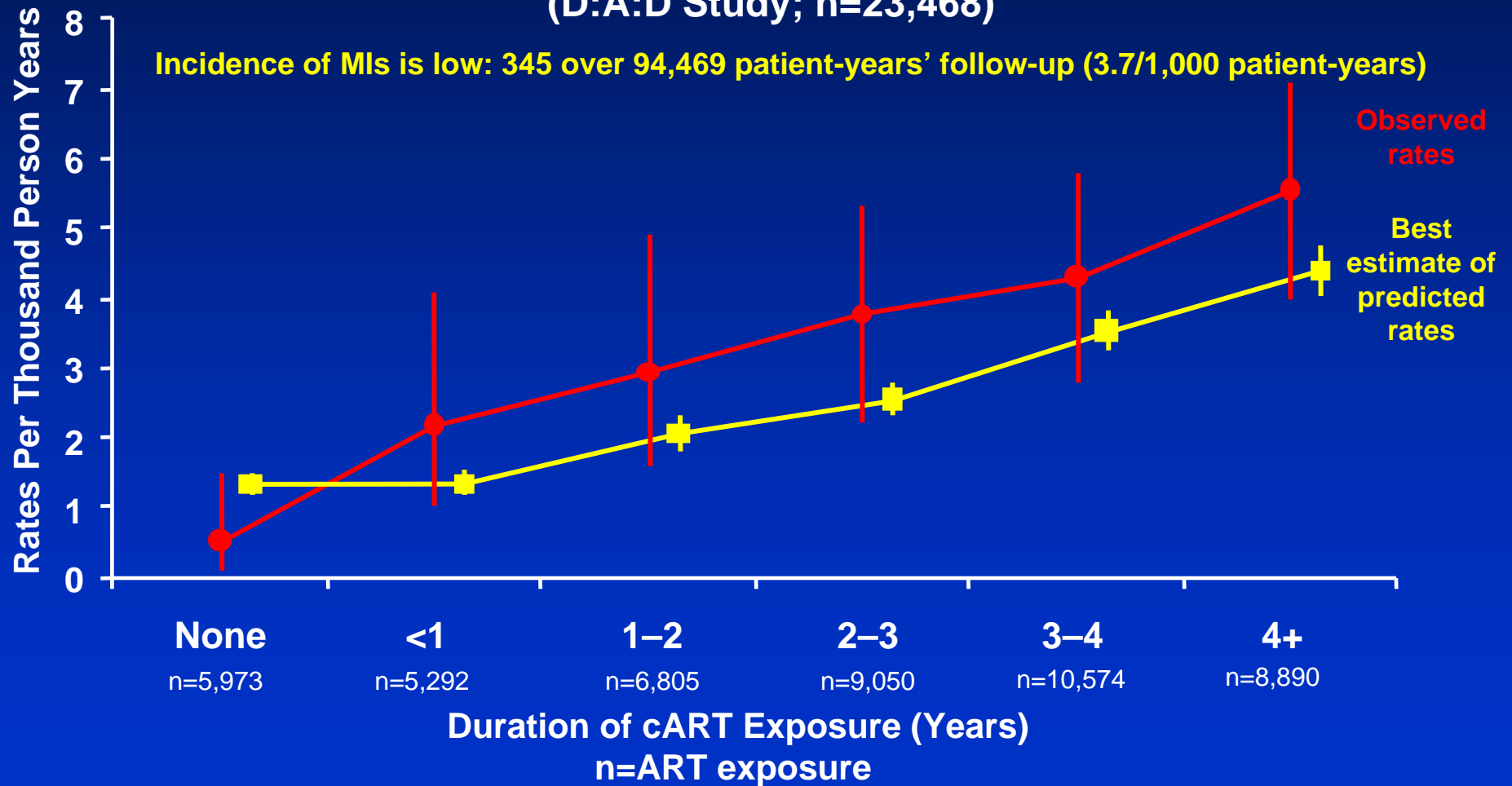
- Chronic diseases, if left untreated and undiagnosed, such as DM and depression are causally related to other diseases
- 90% DM and 80% CHD can be avoided with good nutrition, regular exercise, smoking cessation and stress management
- 20% reduction in cancer rates with daily diets high in vegetables and fruit
- Mammography screening for 70% of women aged 50-69 would prevent 1/3 of breast cancers over a 10 yr period
- 90% of cervical cancer is preventable with regular screening
- FOBT in those aged 50-75 could reduce colorectal cancer mortality by 15-33%

Develop an HIV GPHE?

- Interprofessional screening form, patient tracking form, health questionnaire and patient information on all specific conditions
- Web tools for fracture risk and cardiac risk
- Early identification of chronic disease (case finding)
 - Diabetes
 - Thyroid Disease
 - Cancer
 - Asthma/COPD
 - Obesity
 - Coronary Heart Disease
 - Stroke
 - Arthritis
 - Osteoporosis

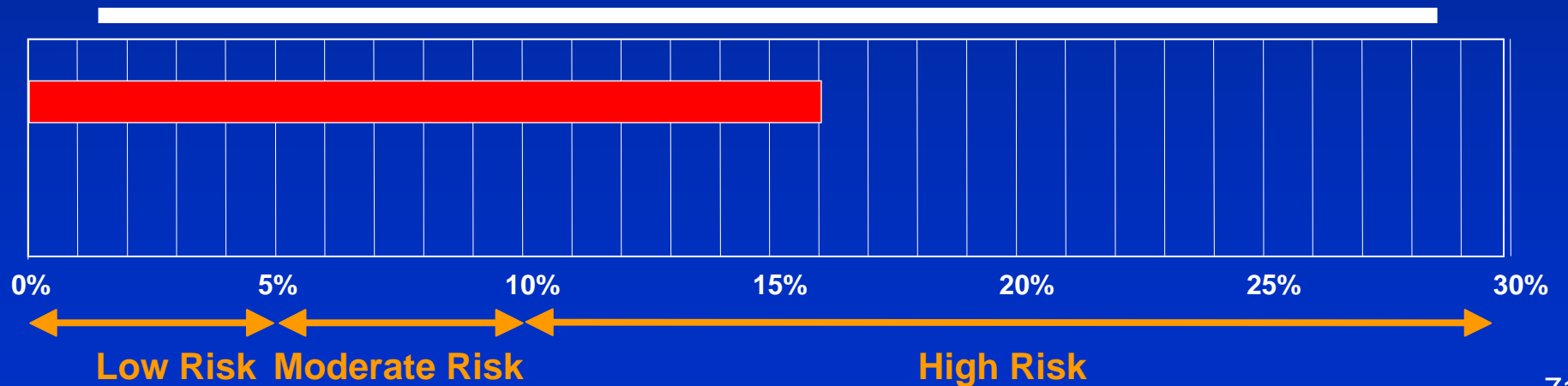
D:A:D Study: Is the Framingham Risk Estimation Valid in HIV-Infected Patients?

Observed and predicted MI rates according to ART exposure
(D:A:D Study; n=23,468)

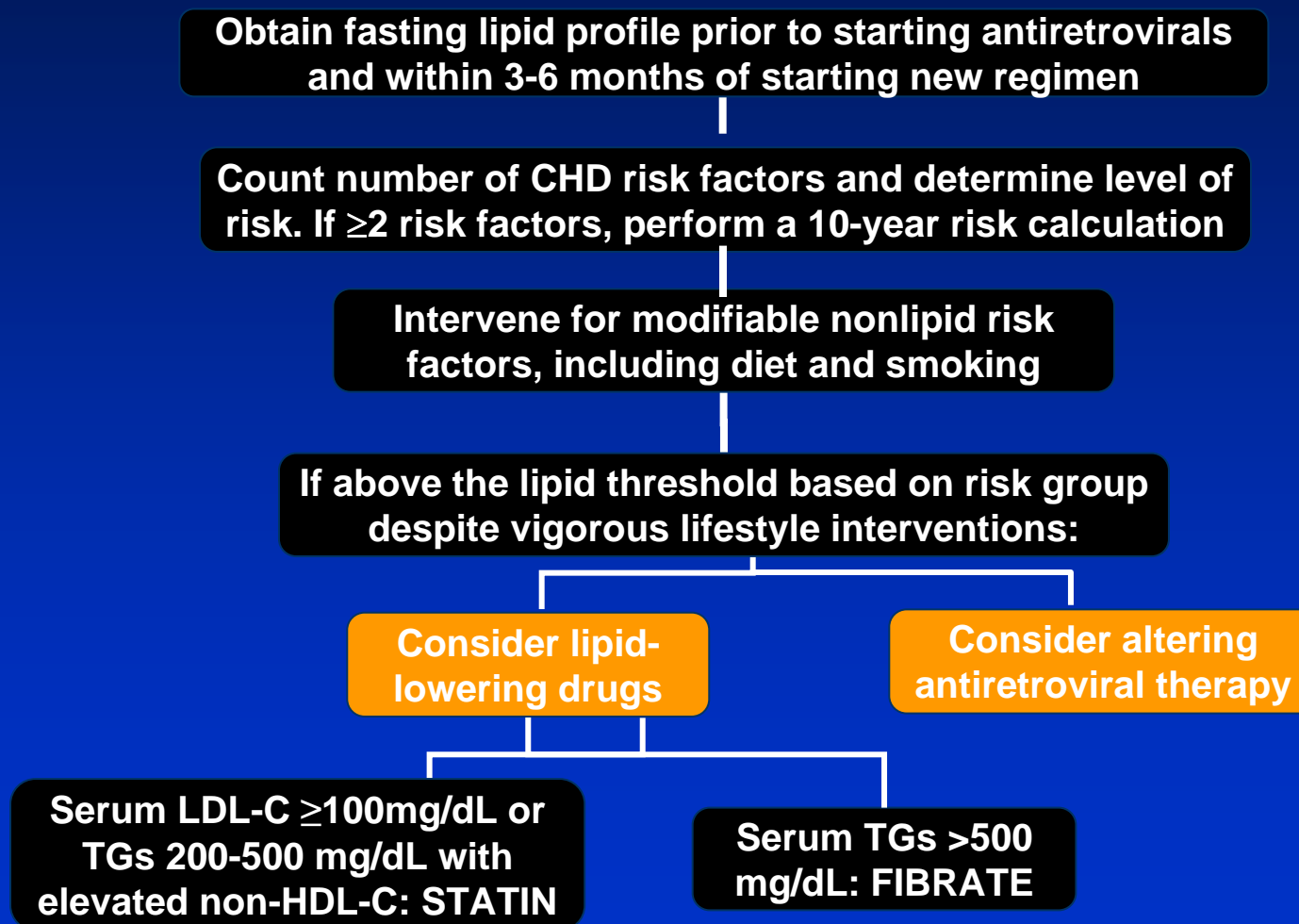


Using the Framingham Risk Score

Risk Factor	Units	
Sex	Male or Female	M
Age	Years	46
Total cholesterol	mg/dL	200 ←
HDL	mg/dL	24 ←
Systolic blood pressure	mmHg	118
Treatment for hypertension (only if SBP >120)	Yes or No	N
Current smoker	Yes or No	Y ←
		16%

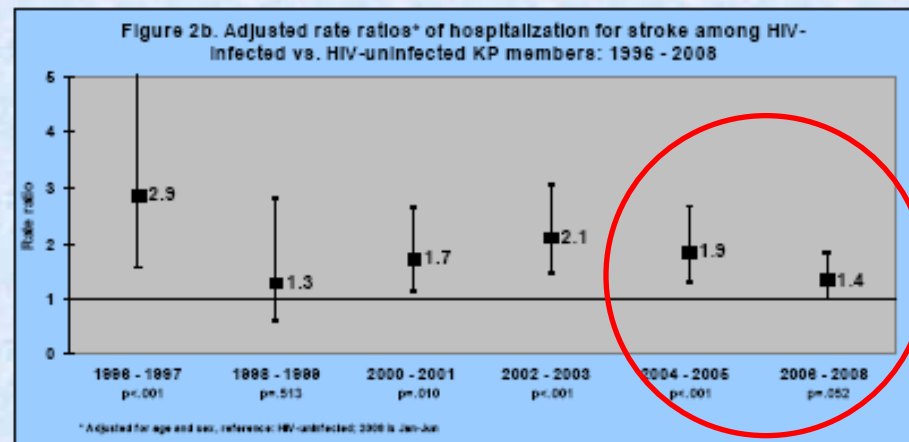
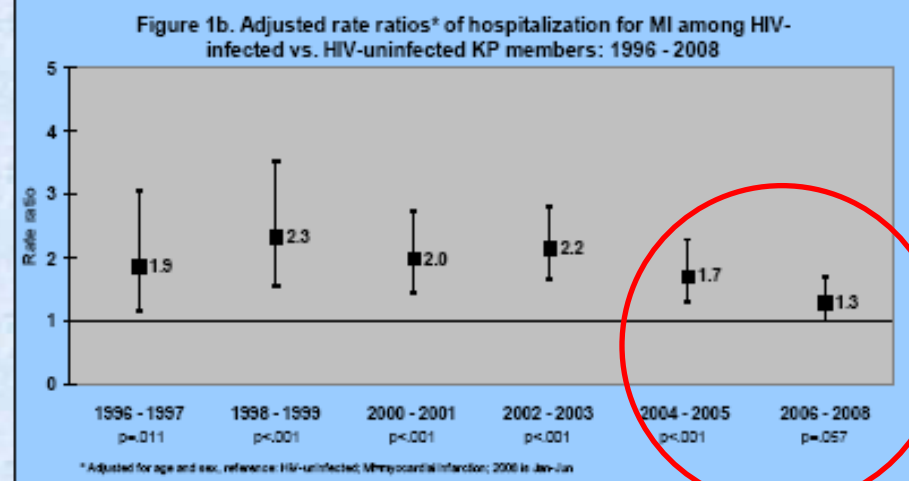


IDSA Guidelines for Managing Lipid Disorders and CVD Risk in Patients Receiving HAART



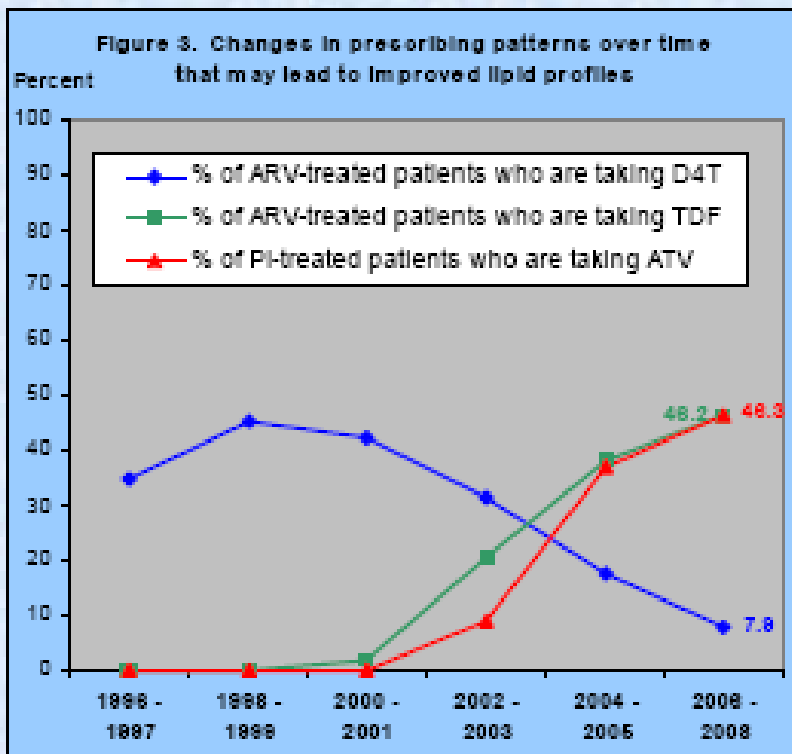
Epidemiology: MIs and Strokes Among Californians With and Without HIV

- Kaiser Permanente
- >35,000 HIV+ patients, >6 million HIV- individuals
- Incidence of MIs and strokes between 1996 and 2008

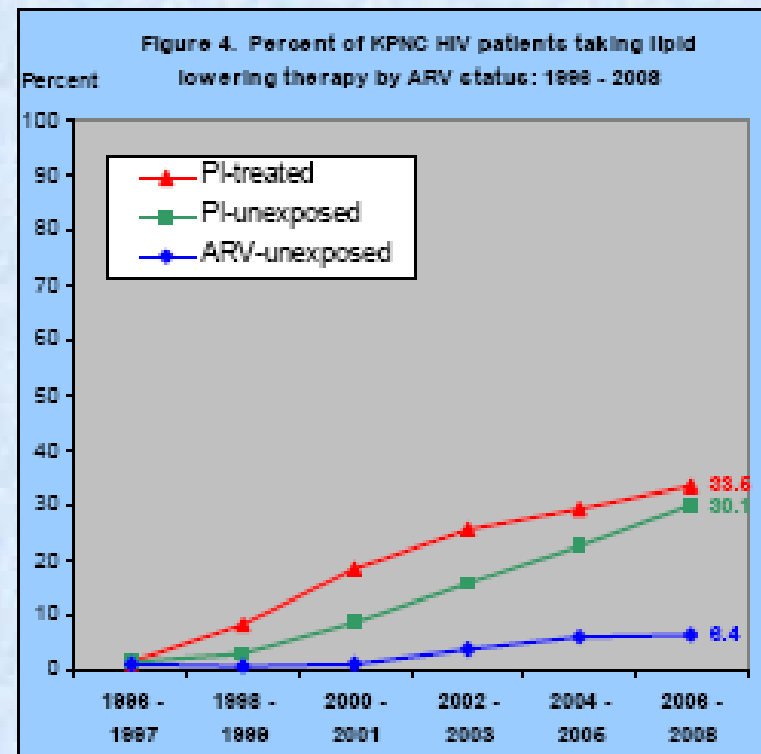


Why the Decrease in CV Event Incidence?

Better drugs

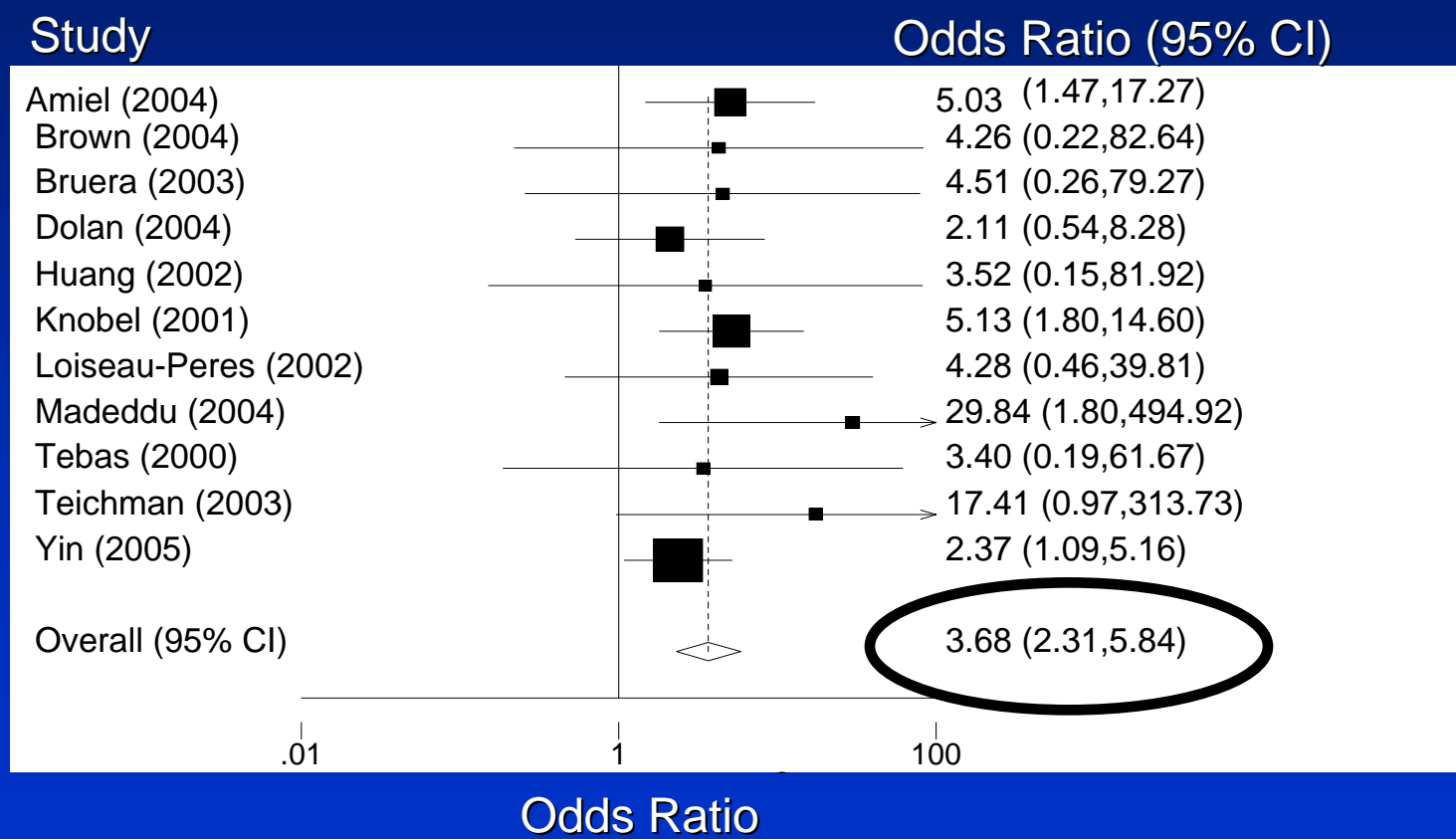


More attention to lipids



Meta-analysis: Prevalence of Osteoporosis in HIV-Infected Patients vs Uninfected Controls

Overall prevalence of osteoporosis in HIV-infected patients = 15%



Calculation Tool

Please answer the questions below to calculate the ten year probability of fracture with BMD.



Weight Conversion:

pound:

Height Conversion:

inch:

60 inch = 152.4 cm

Country : **US (Caucasian)** Name / ID : Jane Doe About the risk factors

Questionnaire:

1. Age (between 40-90 years) or Date of birth
 Age: Date of birth: Y: M: D:

2. Sex Male Female

3. Weight (kg)

4. Height (cm)

5. Previous fracture No Yes

6. Parent fractured hip No Yes

7. Current smoking No Yes

8. Glucocorticoids No Yes

9. Rheumatoid arthritis No Yes

10. Secondary osteoporosis No Yes

11. Alcohol 3 or more units per day No Yes

12. Femoral neck BMD (g/cm²)
 T-Score

BMI 21.5
The ten year probability of fracture (%)

with BMD	
Major osteoporotic	12
Hip fracture	6.3

*1 unit = 8 g alcohol ~ 1/2 pt. beer ~ glass wine

US data suggest it's cost-effective to treat if 10-year probability of hip fx is $\geq 3\%$ or major osteoporotic fx is $\geq 20\%$

(Tosteson ANA, et al. Osteoporos Int 2008;19:437-47).

Evaluation for Secondary Causes of Osteoporosis

25-OH vitamin D	Vitamin D deficiency
Free/total testosterone; menstrual hx	Hypogonadism
Serum calcium, phosphate (iPTH)	Hyperparathyroidism, phosphate wasting
24 hr urine calcium	Idiopathic hypercalciuria
TSH	Subclinical hyperthyroidism

25-OH Vitamin D Levels

< 20 ng/ml	Deficiency
20-29 ng/ml	Insufficiency
30-60 ng/ml	Preferred

n = 57 HIV+ pts at MGH:

- 37% moderate deficiency (10-20 ng/ml)**
- 10% severe deficiency (<10 ng/ml)**

Holick MF. N Engl J Med 2007;357:266-81; Rodriguez M, et al. AIDS Res Hum Retroviruses 2009;25:1-6.

Osteoporosis Recommendations

- **Low bone mass and osteoporosis are prevalent in HIV-infected patients**
- **No consensus/guidelines for screening or treatment of HIV-infected patients**
 - **May be reasonable to screen postmenopausal women and men > age 50; possibly those 40-50 years with risk factors**
 - **Calcium/vitamin D, smoking cessation, weight-bearing exercise, bisphosphonates, fall prevention**

Summary

- ARV has dramatically increased survival
 - Is HIV just another chronic disease, like diabetes?
- Increased survival has increased prevalence of non-HIV-related comorbidities
- Comorbidities may occur at Younger Age in HIV
- Increasing evidence favors starting HAART earlier
 - Benefit may be lower with age or comorbidity
- Primary care screening guidelines are often applicable to HIV patients
 - **Payoff time** may help to determine when particular guidelines are applicable
 - Caution we do not under screen because of wrong assumptions
 - Need to implement general medical screening and treat conditions identified