

# **Modern Doctoring: Disease Prevention and Health Promotion**

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**...and I have no  
disclosures**



# **Disease Prevention & Health Promotion: Key themes**

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**We have become a proactive profession**

- **Coach and mentor**
- **Project manager**

**Health promotion and disease prevention requires  
consistency**

- **Know what you want to say, confidence based on evidence**
- **Understand the “grayness” of it all**
- **Prioritize**

# The screening agenda

## First list:

Hypertension  
Hypercholesterolemia  
Colon cancer  
Cervical cancer  
Breast cancer  
Prostate cancer  
Lung cancer  
Hep C  
Diabetes  
HIV  
STDs  
Skin cancer

## Second list:

Alcohol abuse  
Obesity  
Visual impairment  
Hearing impairment  
Balance  
Injury  
Opioids  
Hypothyroidism  
Osteoporosis  
Depression  
Abdominal Aortic Aneurism  
for men at risk

# The health promotion agenda

## *First list:*

- Smoking
- Immunizations
- Chemoprophylaxis
- Vitamins
- Estrogens
- Aspirin
- H. pylori treatment
- SBE prophylaxis
- Orthopedic prophylaxis

## *Second list:*

- Exercise
- Injury prevention
- STD prevention
- Sleep
- Work hours
- Herbal therapies

# The promise of screening

## Screening Tests



# The risks of false promises

theranos



one tiny drop  
changes  
everything.

At Theranos, we're working to shape the future of lab testing. Now, for the first time, our high-complexity CLIA-certified laboratory can perform your tests quickly and accurately on samples as small as a single drop.



# History of Screening

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**1900: Diabetes with urine sugar**

**1905: Syphilis**

**1917: US army for psychiatric disorders**

**1937: New York City cervical and breast cancer by PE**

**1960: Mammography**

**1963-1986: Health Insurance Plan of Greater NY RCT  
of mammography**

# When to we order?



# Our job and Babe the Pig



**We talk to our patients....  
and then ask them to do what we recommend**

# Principles of testing

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## Test characteristics:

### Sensitivity:

Probability of a positive test when disease present  
(Positivity in Disease, PID)

### Specificity:

Probability of a negative test when disease not present (Negativity in Health, NIH)

# Principles of testing

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**Population based:**

**Predictive value positive:**

Probability of a disease when the test is positive

**Predictive value negative:**

Probability of not having a disease when the test is negative

# Number needed to treat (or screen) (NNT or NNS):

The number of patients that need to be treated in a specified fashion over a period of time to prevent a designated outcome (or detect a designated condition).

- $NNT = 1/\text{absolute risk reduction}$
- Derived from RCT data
- Applies for an interval of time

# The “culture of screening:” Who makes the rules?

- Professional societies
  - American College of Physicians
  - American Heart Association
- Hybrids
  - American Cancer Society
- Government
  - Congress:
    - USPSTF

**The Affordable Care Act (ACA) empowered the USPSTF to establish the screening tests to be covered by ALL carriers**



# ACA required screening for Level A and B USPSFH recommendations

|                          |                 | Certainty of benefit: |                 |              |   |
|--------------------------|-----------------|-----------------------|-----------------|--------------|---|
|                          |                 | <u>Substantial</u>    | <u>Moderate</u> | <u>Small</u> |   |
| Importance of condition: | <u>High</u>     | A                     | B               | C            | D |
|                          | <u>Moderate</u> | B                     | B               | C            | D |
|                          | Low             | I                     | I               | I            | I |

But what is to be done when the “USPSTF concludes “that there is insufficient evidence to assess the balance of benefits and harms...”

# Hypertension

## Recommendation (USPSTF, 2015):

### Annual BP screening

All adults age  $\geq 40$  yrs

All adults age 18-39 years

- if DBP  $\geq 85$  or SYS BP  $\geq 130$

- if obese, overweight

- African American

Every 3-5 years for all others.

# Hypercholesterolemia

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## Recommendations (USPSTF, 2016):

### Screen (and treat)

All adults age 40-75

-if RFs (HTN, DM, Smoking) and 10 year risk  $\geq 10\%$

Offer to all adults age 40-75

-if RFs and 10 year risk 7.5-10%

All adults age  $> 75$ : Data “insufficient”



## 2013 Prevention Guidelines Tools

# CV RISK CALCULATOR

The American Heart Association and the American College of Cardiology are excited to provide a series of new cardiovascular prevention guidelines for the assessment of cardiovascular risk, lifestyle modifications that reduce risk, management of elevated blood cholesterol, and management of increased body weight in adults. To support the implementation of these guidelines, the new Pooled Cohort Equations CV Risk Calculator and additional Prevention Guideline Tools are available below. Others may be developed and available in the near future.

[DOWNLOAD CV RISK CALCULATOR](#)

[Back](#) Interactive Tools

ASCVD Risk Estimator [Chol/CV Risk]



Gender

Race

Age  years

Total cholesterol

HDL cholesterol

Systolic blood pressure  mmHg

On blood pressure medication ☒ No ☐ Yes

Diabetes ☐ No ☒ Yes

Smoker ☐ No ☒ Yes

Your 10-year risk of CVD

10-year risk of CVD in individual with optimal risk factor medication

Your lifetime risk of CVD

Lifetime risk of CVD in 50 year-old with optimal risk factor medication

### RECOMMENDATIONS:

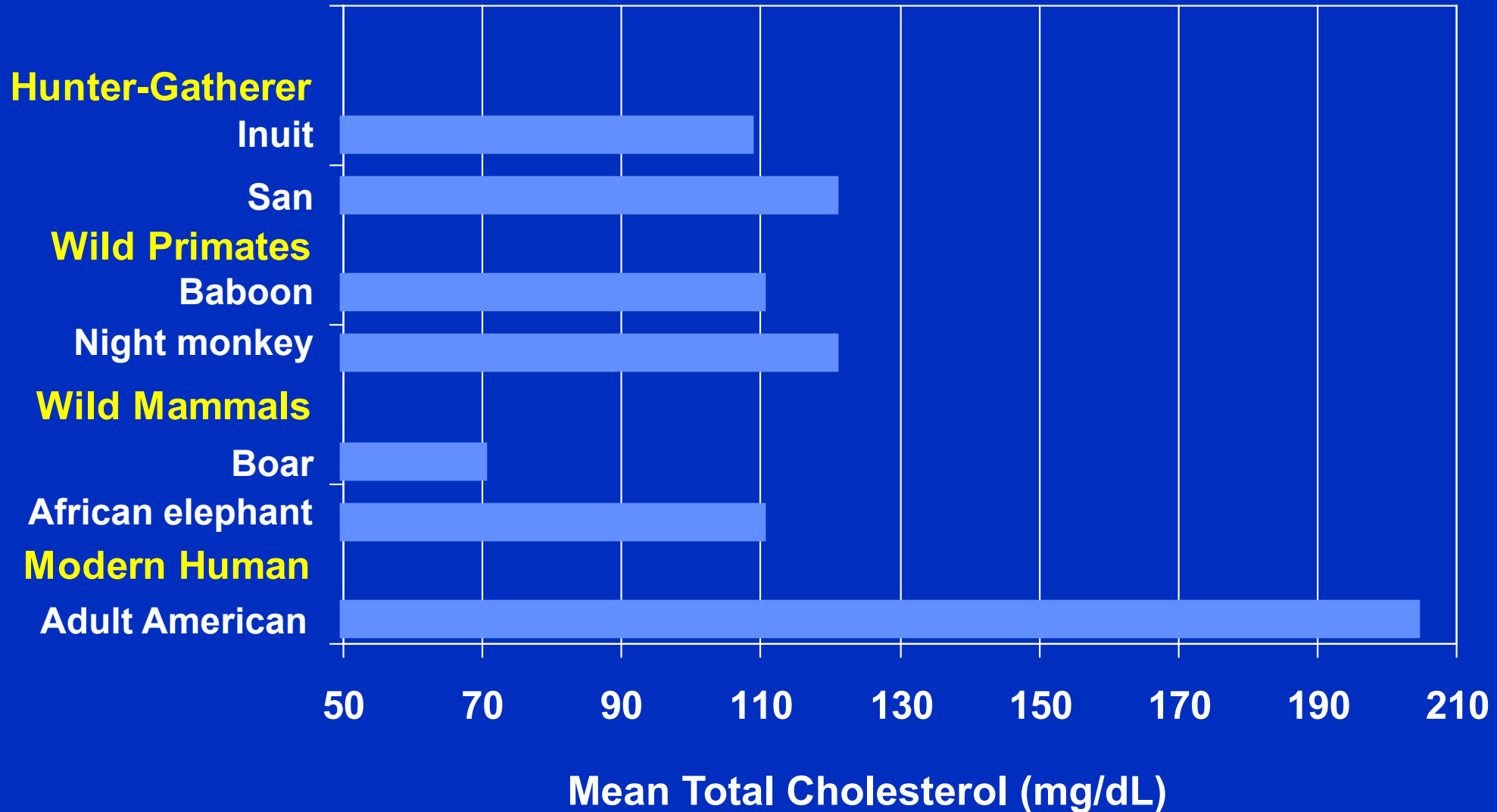
Based on the data entered above (assuming no clinical ASCVD and LDL-C 70-189 mg/dL):

**Consider high-intensity statin** Moderate-intensity statin therapy should be initiated or continued for adults 40 to 75 years of age with diabetes mellitus. (I A)

High-intensity statin therapy is reasonable for adults 40 to 75 years of age with diabetes mellitus with a  $\geq 7.5\%$  estimated 10-year ASCVD risk unless contraindicated. (IIa B)



# The ideal total mammalian cholesterol is 70-140 mg/dL



# What is the benefit from intervention at Low LDL levels

JAMA | Original Investigation

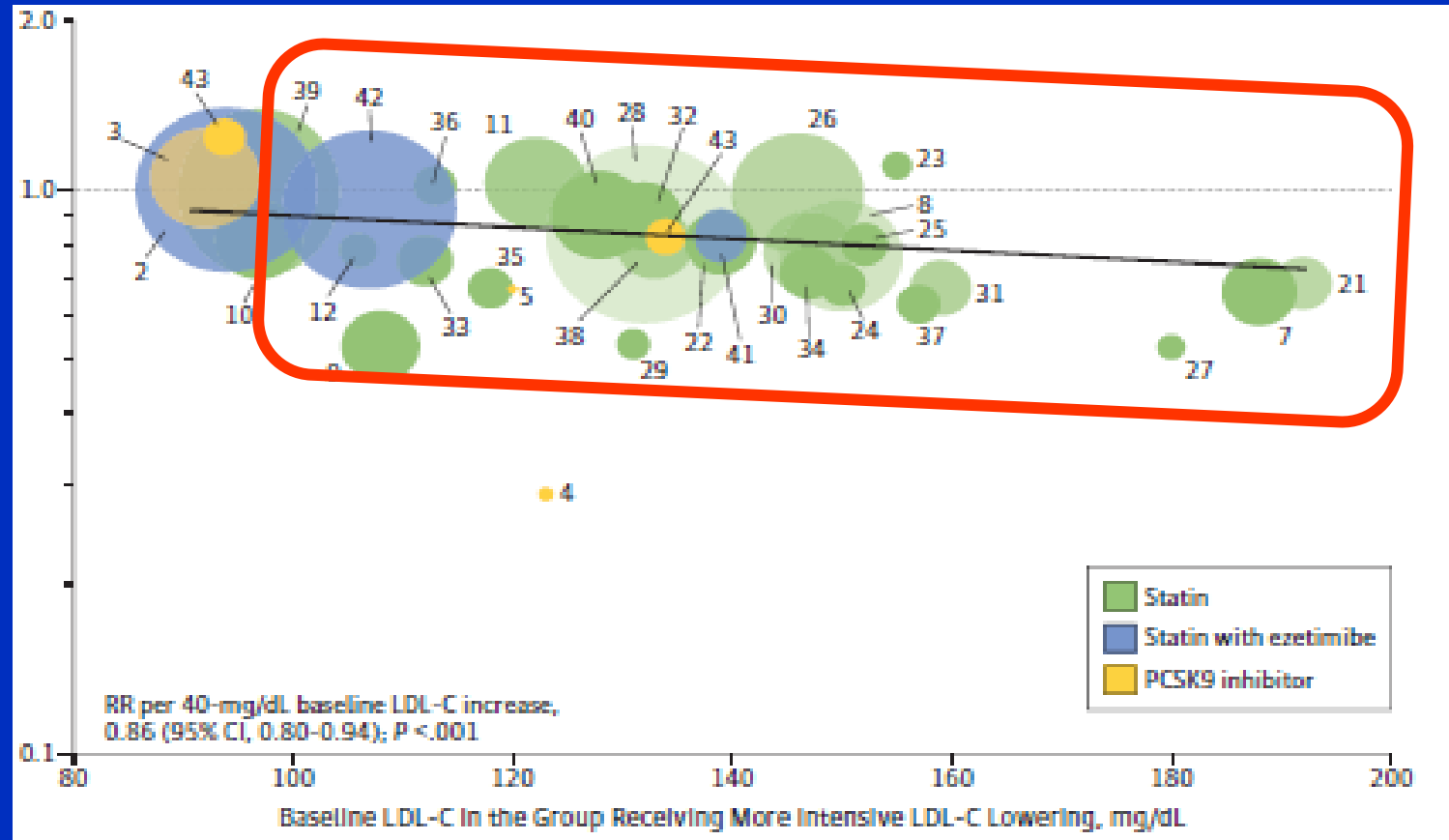
## Association Between Baseline LDL-C Level and Total and Cardiovascular Mortality After LDL-C Lowering A Systematic Review and Meta-analysis

Eliano P. Navarese, MD, PhD; Jennifer G. Robinson, MD, MPH; Mariusz Kowalewski, MD; Michalina Kołodziejczak, MD; Felicita Andreotti, MD; Kevin Bliden, MD; Udaya Tantry, PhD; Jacek Kubica, MD, PhD; Paolo Raggi, MD; Paul A. Gurbel, MD

Meta-analysis of 34 trials with 136 299 patients  
Trials with over 1000 patients  
Patients followed for at least 4 years

# Benefit from LDL reduction was found when baseline LDL $\geq 100$ mg/dl

Risk reduction in all CV mortality

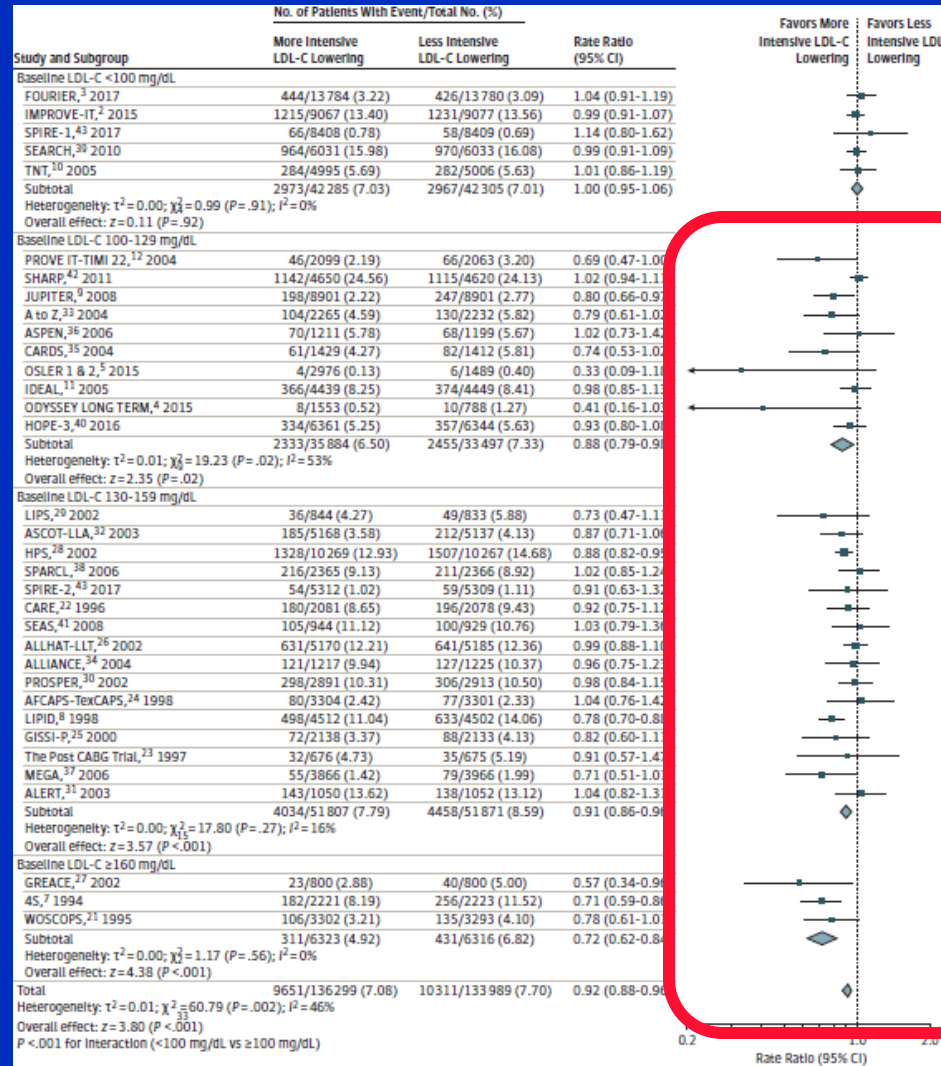


Size = size of study  
Color = treatment  
Number = study

When all studies were combined, approximately 10 % RR/40 mg/dl LDL reduction BUT...only when LDL  $\geq 100$  mg/dl

Baseline LDL

# Benefit from LDL reduction was found when baseline LDL $\geq 100$ mg/dl



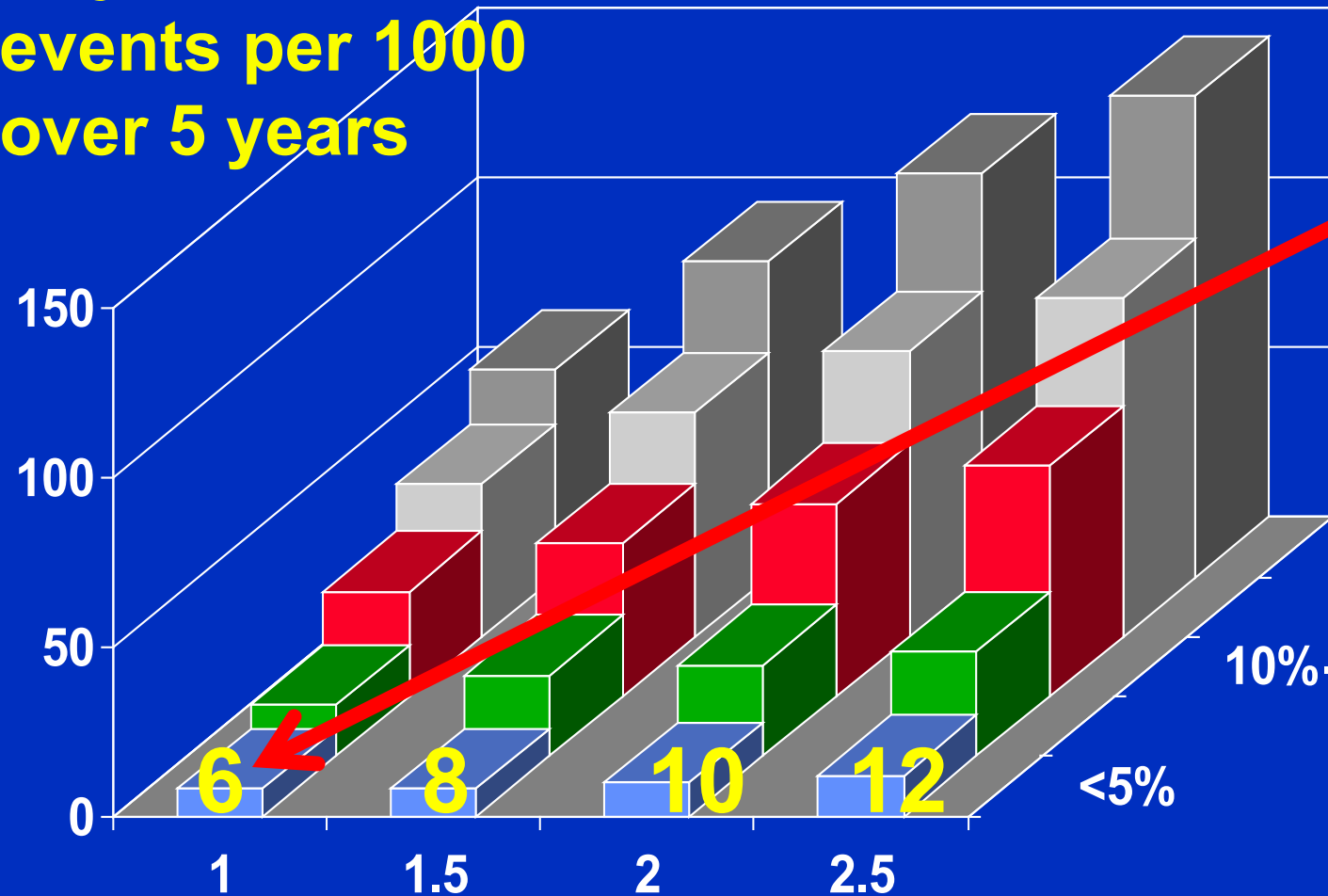
**Consistent benefit with baseline LDL  $\geq 100$**

# What about primary prevention over age 75 yrs.?

|            | Risk reduction per 1 mmol/L (38.6 mg/dl) |        |                   |
|------------|------------------------------------------|--------|-------------------|
|            | Major coronary event                     | Stroke | Revascularization |
| ≤ 55 years | 31%                                      | 12     | 25                |
| 55 to ≤60  | 23%                                      | NS     | 25                |
| 60 to ≤65  | 26 %                                     | 18     | 19                |
| 65 to ≤70  | 23%                                      | 17     | 31                |
| 70 to ≤75  | 19%                                      | 16     | 24                |
| ≥75        | 18%                                      | NS     | NS                |

# Statins for low risk patients

Major vascular  
events per 1000  
over 5 years



6 major vascular  
events  
prevented for  
every 1000  
low risk patients  
treated for  
5 years

>30%

10%-<20%

<5%

5 yr risk level

LDL reduction, 1 mmol/L = 38 mg/dL

# ACC/AHA Statin “Intensities”

|              | HIGH     | MODEERATE |
|--------------|----------|-----------|
| Atorvastatin | 40-80 mg | 10-20 mg  |
| Rosuvastatin | 20-40 mg | 5-10 mg   |
| Simvastatin  |          | 20-40 mg  |
| Pravastatin  |          | 40-80 mg  |
| Lovastatin   |          | 40 mg     |
| Fluvastatin  |          | 40 mg     |
| Pitavastatin |          | 2-4 mg    |

# Statin side effects are low

| Trial   | Drug                 | Myalgia, % |         | Rhabdomyolysis, % |         |
|---------|----------------------|------------|---------|-------------------|---------|
|         |                      | Statin     | Placebo | Statin            | Placebo |
| 4S      | Simvastatin 20-40 mg | 3.7        | 3.2     | 0                 | 0       |
| HPS     | Simvastatin 40 mg    | NR         | NR      | 0.04              | 0.01    |
| CARDS   | Atorvastatin 10 mg   | 4.0        | 4.8     | 0                 | 0       |
| ASPEN   | Atorvastatin 10 mg   | 3.0        | 1.6     | 0.08              | 0.08    |
| SPARCL  | Atorvastatin 80 mg   | 5.5        | 6.6     | 0.1               | 0.1     |
| JUPITER | Rosuvastatin 20 mg   | 7.9        | 6.9     | 0.01              | 0       |

# Compliance makes a difference:

Statin usage (based on days “covered with statin”) associated with better outcomes over 5 years (Israeli HMO)

| Percentage days covered | Primary Risk reduction | Secondary Risk reduction |
|-------------------------|------------------------|--------------------------|
| < 10%                   | 1.0                    | 1.0                      |
| <b>40-49%</b>           | <b>14%</b>             | <b>27%</b>               |
| <b>&gt; 90%</b>         | <b>45%</b>             | <b>41%</b>               |

# Targeted diabetes screening

## Recommendations:

USPSTF( 2015): Adults aged 40-70 years who are overweight

ADA (2014) recommends screening for the following:

1. **BMI  $\geq$  25 with risk factors**

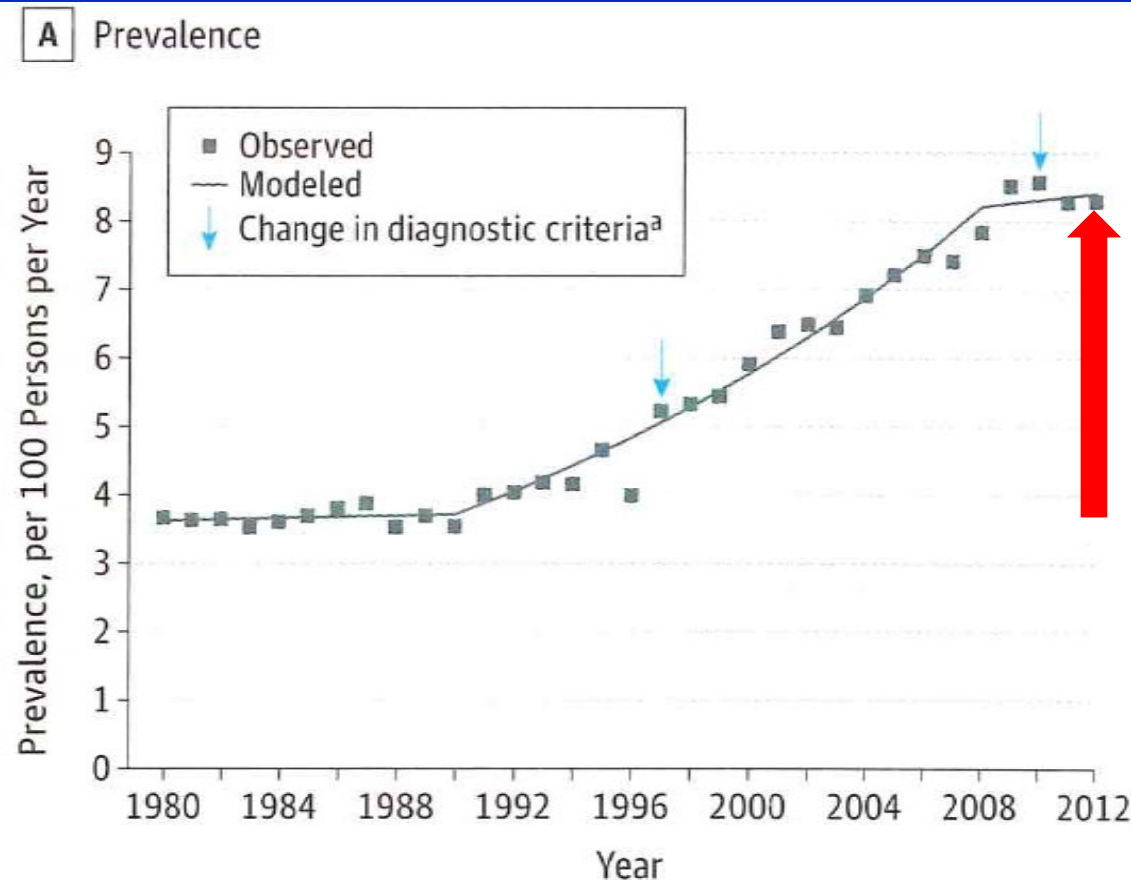
|                     |                                  |
|---------------------|----------------------------------|
| Inactivity          | HTN                              |
| FH DM               | HDL < 35 mg/dL or TG > 250 mg/dL |
| High risk ethnicity | PCOS                             |
| Gestational DM      | Any cardiovascular disease       |

2. **Any patient over 45**

# Diabetes: Diagnostic criteria (ADA 2016)

| Test            | Normal | Pre Diabetes                | Type 2 Diabetes      |
|-----------------|--------|-----------------------------|----------------------|
| HbA1c, %        | < 5.7  | 5.7-6.4                     | ≥6.5                 |
| Fasting glucose | <100   | 100-125<br>(5.6-6.9 mg/dL)  | ≥126<br>(≥ 7 mg/dL)  |
| Oral GTT        | <140   | 140-199<br>(7.8-11.0 mg/dL) | ≥200<br>(11.1 mg/dL) |

# Age-adjusted prevalence of diabetes (adults aged 20-79, 1980-2012)



**Over 100% increase  
in DM prevalence  
in 25 years,  
1987 to 2012**

# Targeted HIV and STD screening

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## Recommendations:

**Screen for HIV adolescents and adults aged 15-65 years at increased risk.**

**All pregnant women, including at labor and delivery.**

# **STDs screening:**

## **Based on sexual behaviors**

### Targeted:

Syphilis (blood testing): Sex workers, those in correctional facilities

### General:

Chlamydia (urine testing): Offer to men and women up to age 26 and beyond with multiple partners

Gonorrhea (urine testing): Offer to men and women up to age 26 and beyond with multiple partners

# Targeted Hepatitis C screening

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## Recommendation (USPSTF, 2013):

All born in between 1945-1965

Any who have received donated blood or organs  
before 1992

Any who have ever injected drugs or have had an  
unregulated tatoo

Any with chronic liver disease, HIV

# Alcoholism

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## Recommendation:

**Have a structured office routine:**

- Consumption
- Peak amounts (binge patterns)
- Alcohol risks (driving and relationships)

# USPSTF: Screen for “unhealthy” alcohol

|                         | Men                                             | Women                                           |
|-------------------------|-------------------------------------------------|-------------------------------------------------|
|                         | <b>Risky/at risk</b>                            |                                                 |
| <b>Age 21-64</b>        | <b>&gt; 4 drinks/day<br/>&gt; 7 drinks/week</b> | <b>&gt; 3 drinks/day<br/>&gt; 7 drinks/week</b> |
| <b>Age 65 and older</b> | <b>&gt; 3 drinks/day<br/>&gt; 7 drinks/week</b> | <b>&gt; 3 drinks/day<br/>&gt; 7 drinks/week</b> |
|                         | <b>Binge/heavy</b>                              |                                                 |
|                         | <b>&gt; 5 drinks/day</b>                        | <b>&gt; 4 drinks/day</b>                        |

# Just a cautionary word makes a difference

## Meta-analysis of “brief” alcohol intervention ( $< 15$ mm) and one follow up visit

|                                         |        |
|-----------------------------------------|--------|
| Reduction in drinks/week<br>vs. control | 13-34% |
|-----------------------------------------|--------|

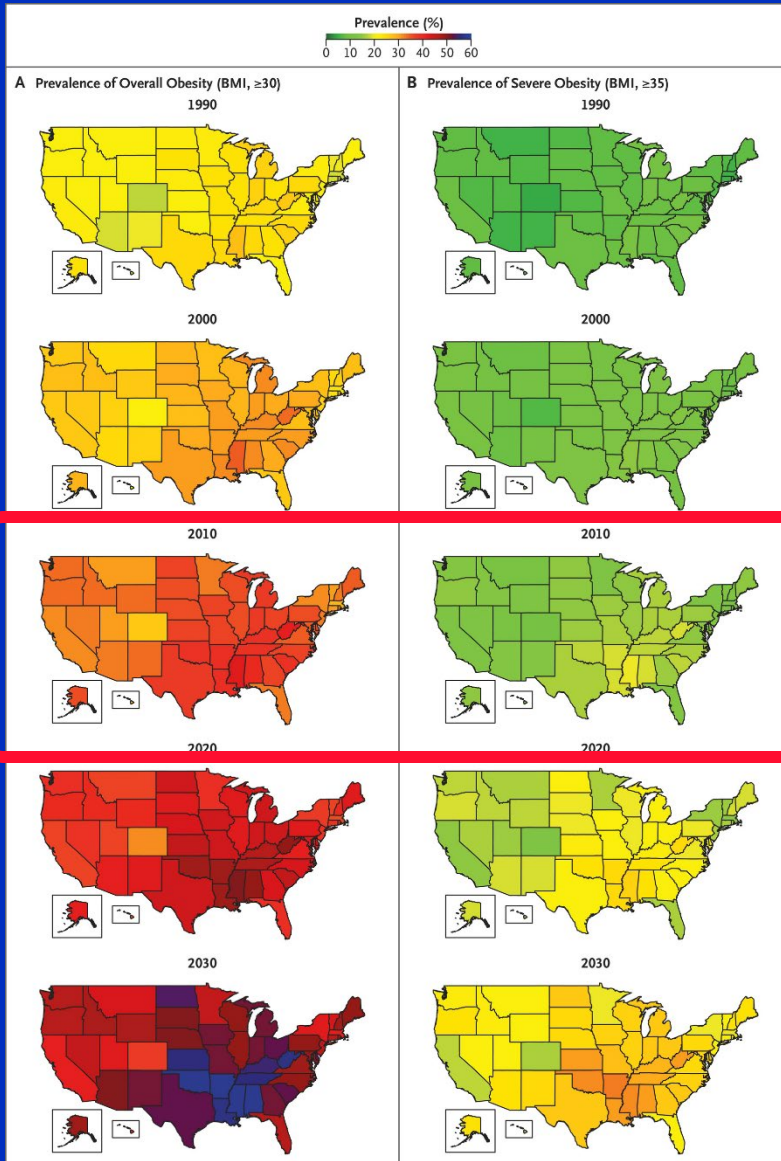
|                                                                |        |
|----------------------------------------------------------------|--------|
| Increase in moderate<br>or safe alcohol<br>intake vs. controls | 10-19% |
|----------------------------------------------------------------|--------|

# Obesity, BMI > 30

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**Rationale:** Obesity increases risk for diabetes, hypertension, cardiovascular disease, cancer (colon, rectum, prostate, gallbladder, biliary tract, breast, cervix, endometrium), degenerative arthritis, cholelithiasis, sleep apnea, venous disease.

# Projecting the obesity crisis: 1990 to 2030



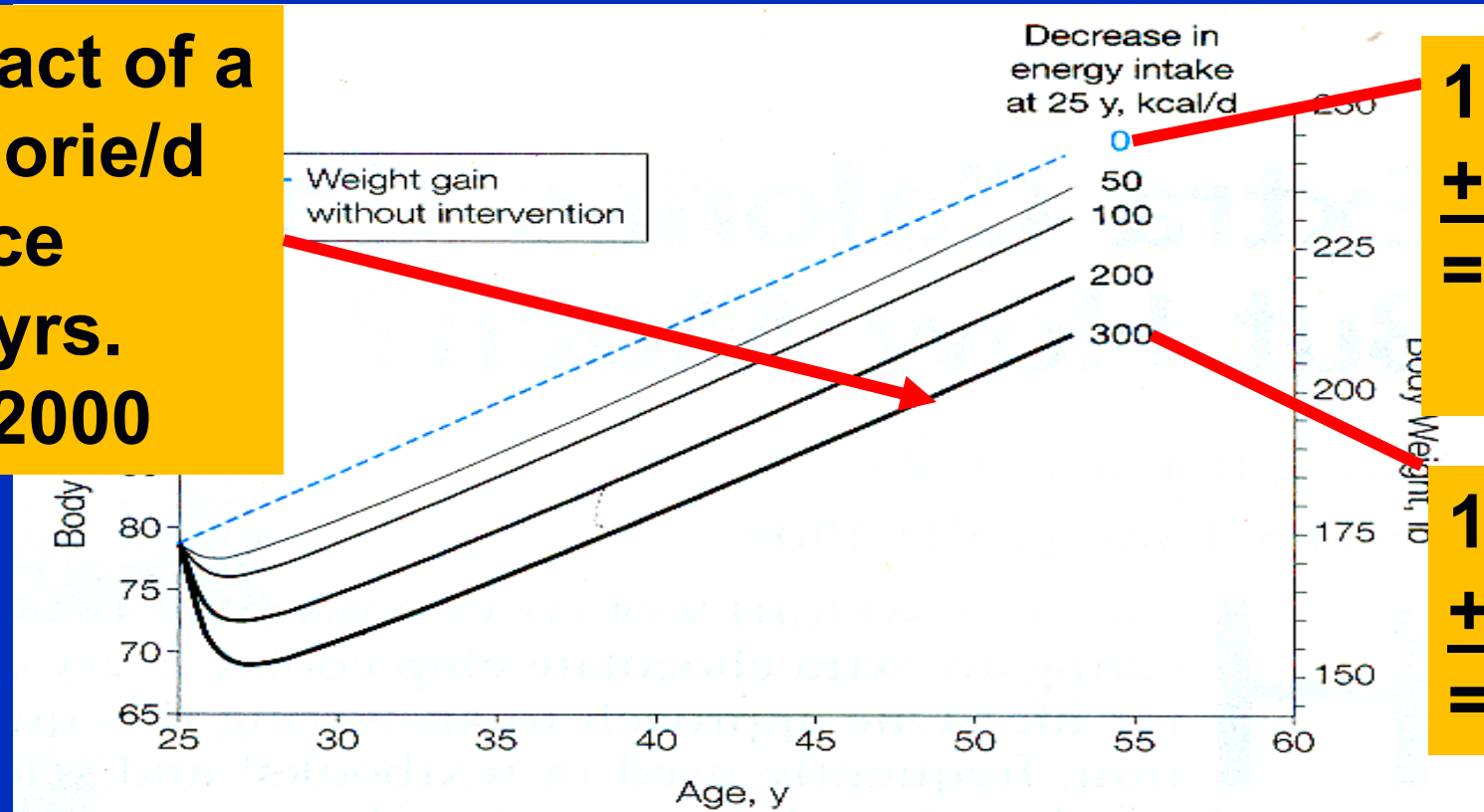
**By 2030, nearly 50% of US adults will have obesity (BMI > 30)**

**By 2030, nearly 25% of US adults will have severe obesity (BMI  $\geq 35$ )**

# Calorie reduction should be maintained through life to avoid the “energy surplus”

**The impact of a  
- 300 calorie/d  
difference  
over 30 yrs.  
1970 to 2000**

**175 lbs**



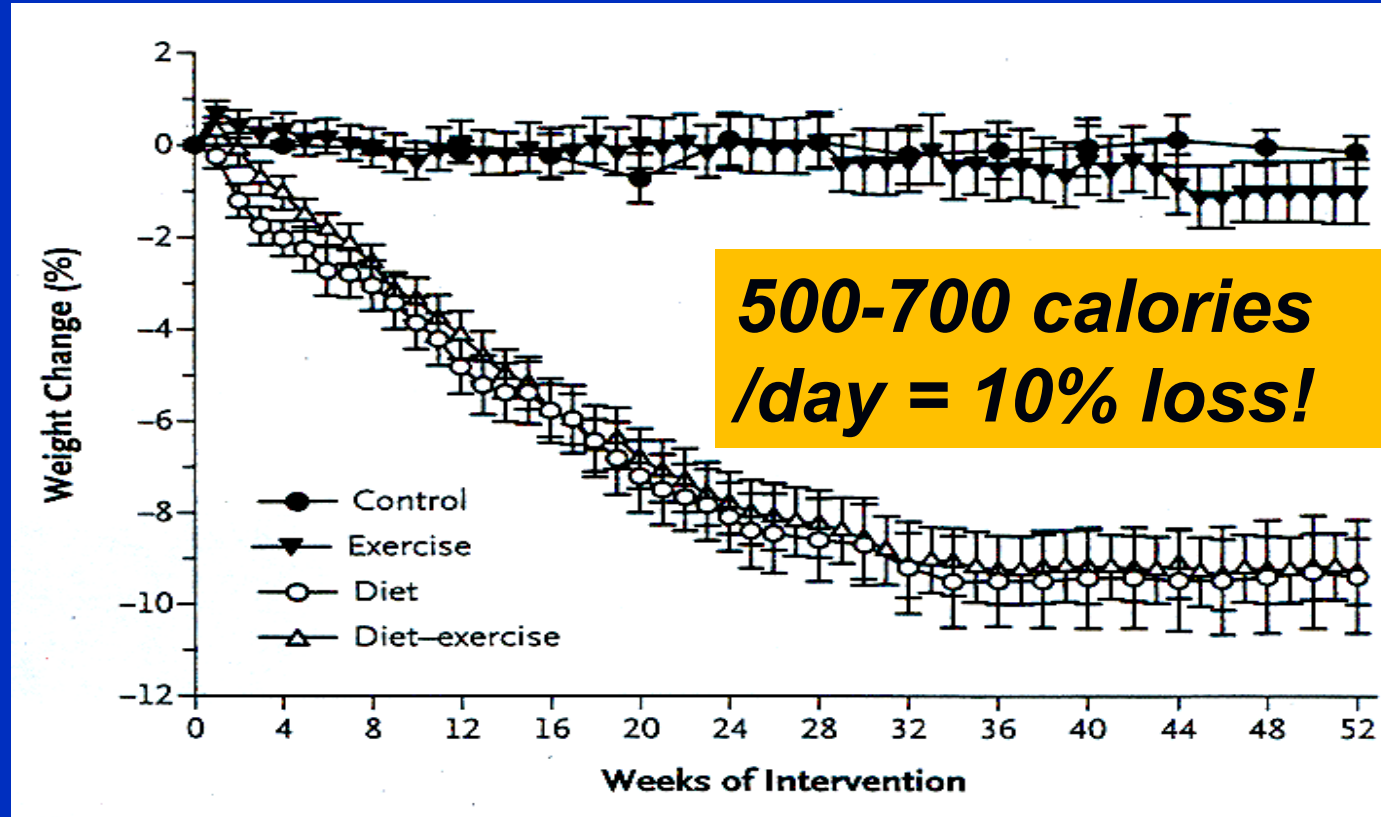
**1970-2000  
+70 lbs.  
=245 lbs.**

**1970-2000  
+35 lbs.  
=210 lbs.**

**Energy surplus = hypothetical difference between ideal calorie intake,  
excess calories eaten, and reduced calories utilized**

# Diet and diet alone is the key to weight loss

(RCT N=107, control, exercise, diet, diet and exercise one year follow-up)



- Control
- Exercise

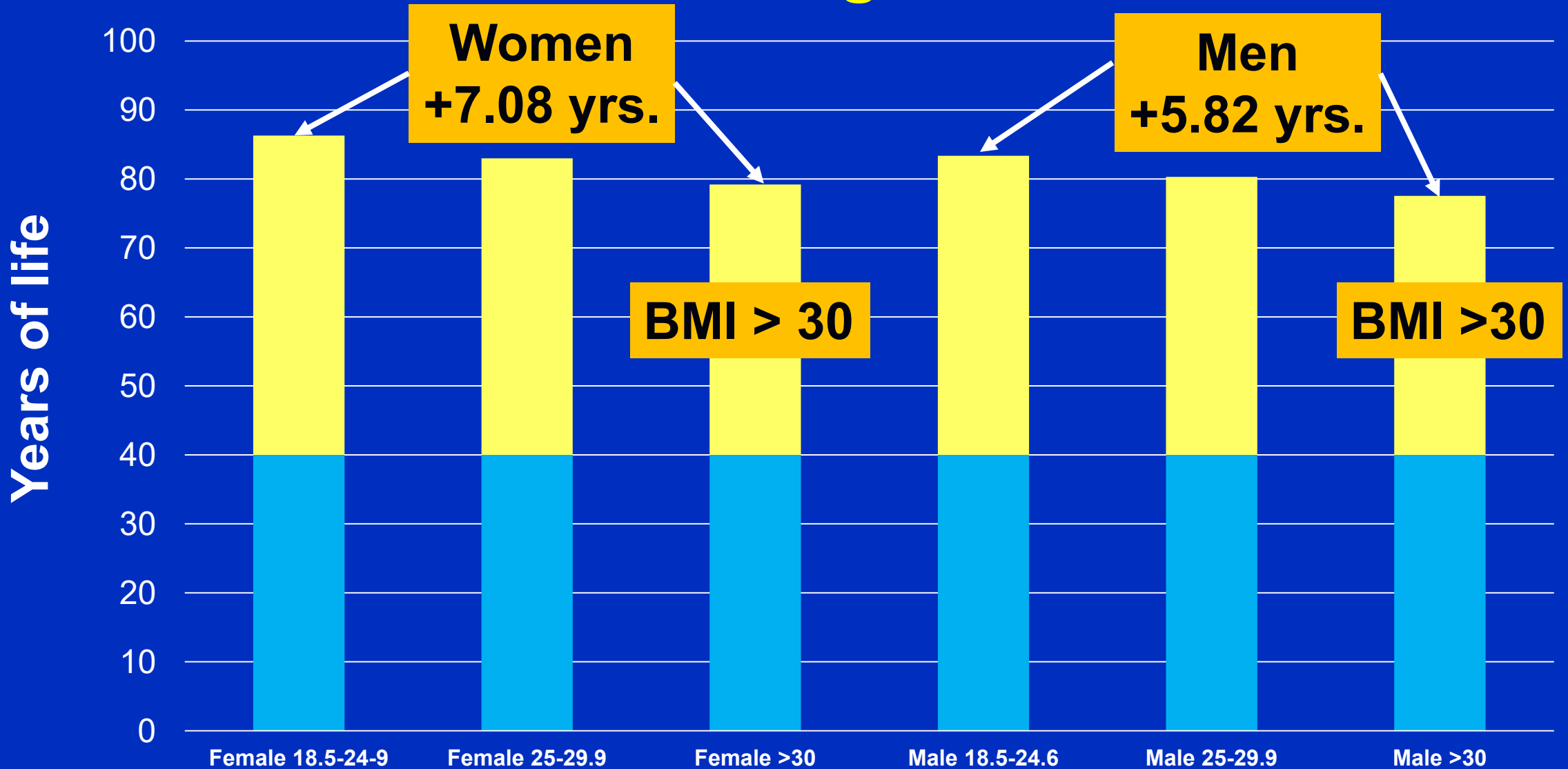
- Diet
- Diet + Exercise

Exercise = 90 minutes TIW

Diet = 500-750 calorie/d deficit

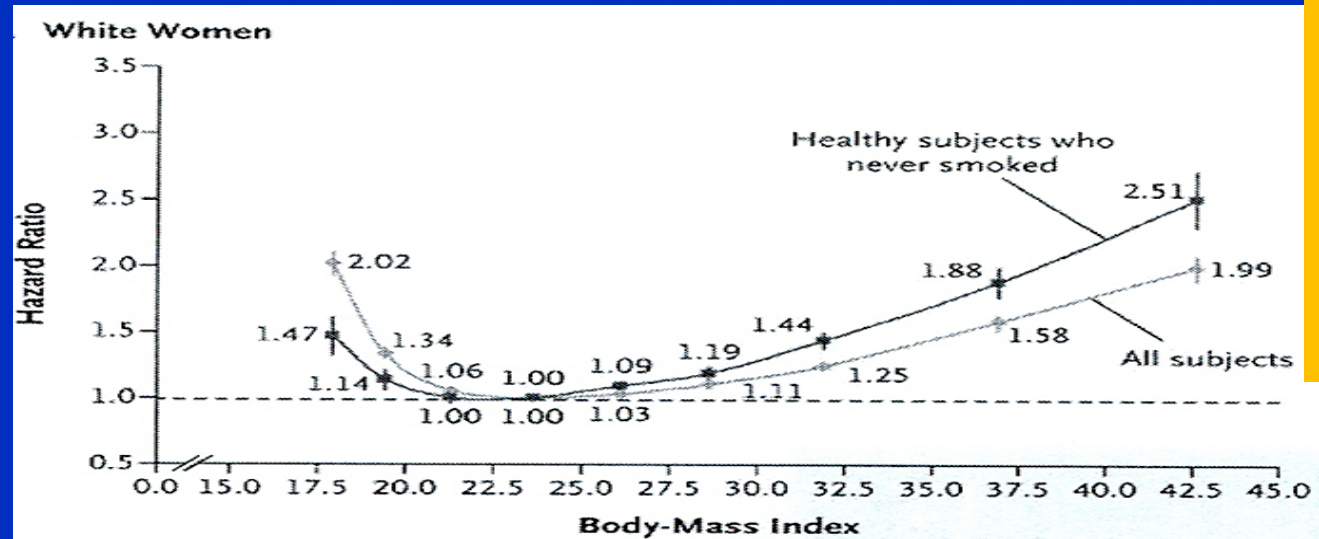
# Life expectancy at age 40 years by BMI

## Non smokers, Framingham cohort, 2003



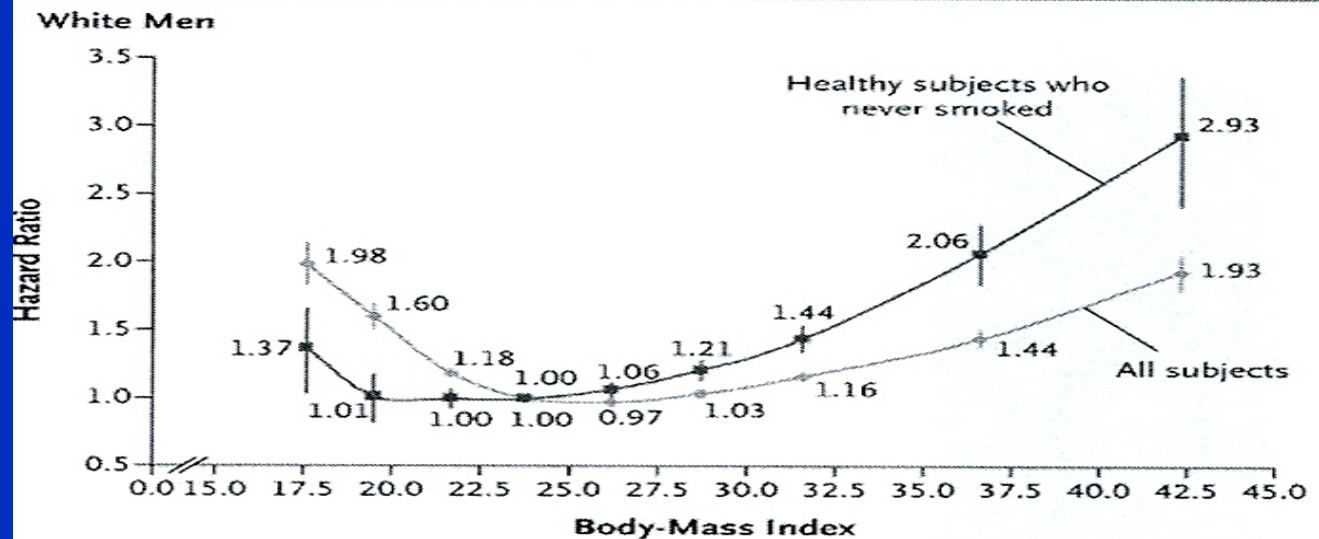
# High (and low) BMIs predict mortality (2010 1.46 million white adults, 19 studies)

Women



**BMI 42.5=>  
250% higher  
death risk,  
non smokers**

Men



**BMI 42.5=>  
300% higher  
death risk,  
non smokers**

# Know where you want your patients to find the information they need

| Nutrition Facts                                                             |                  |
|-----------------------------------------------------------------------------|------------------|
| 8 servings per container                                                    |                  |
| Serving size                                                                | 2/3 cup (55g)    |
| Amount per 2/3 cup                                                          |                  |
| Calories                                                                    | 230              |
| % DV*                                                                       |                  |
| 12%                                                                         | Total Fat 8g     |
| 5%                                                                          | Saturated Fat 1g |
|                                                                             | Trans Fat 0g     |
| 0%                                                                          | Cholesterol 0mg  |
| 7%                                                                          | Sodium 160mg     |
| 12%                                                                         | Total Carbs 37g  |
| 14%                                                                         | Dietary Fiber 4g |
|                                                                             | Sugars 1g        |
|                                                                             | Added Sugars 0g  |
|                                                                             | Protein 3g       |
| 10%                                                                         | Vitamin D 2mcg   |
| 20%                                                                         | Calcium 260mg    |
| 45%                                                                         | Iron 8mg         |
| 5%                                                                          | Potassium 235mg  |
| * Footnote on Daily Values (DV) and calories reference to be inserted here. |                  |

Serving  
Calories  
Fat  
Sodium

See Frank Sack's shopping guidelines in Appendix

# Hypothyroidism

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**Recommendation (USPSTF):** “More research is needed to determine the clinical benefits associated with thyroid screening.”

**Consider screening with TSH at age 65; for women, possibly over 35.**

# Subclinical hypothyroidism should be treated for a TSH > 10

(55,287 patients for 11 international cohort studies)

## Increased coronary heart disease events and mortality

|           |                   |             |
|-----------|-------------------|-------------|
| TSH Level | 4.5 – 6.9 mIU/L   | 1.0         |
|           | 7.0 – 9.9         | NS          |
|           | <u>10.0 – 9.9</u> | <u>1.89</u> |

# Osteoporosis

**Screening women for osteoporosis, 2 year interval**  
**(Grade B, 100% covered by ALL plans)**

Women  $\geq$  65 years

Women  $\leq$  60 years whose 10 year fracture  
risk  $\geq$  65 year old white women without RF

**Screening men for osteoporosis, 2 year interval**  
**(Grade Indeterminate, NOT covered)**

Men whose 10 year fracture risk is  $\geq$  65 year old  
white women without RF

# Depression

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## Suspect depression:

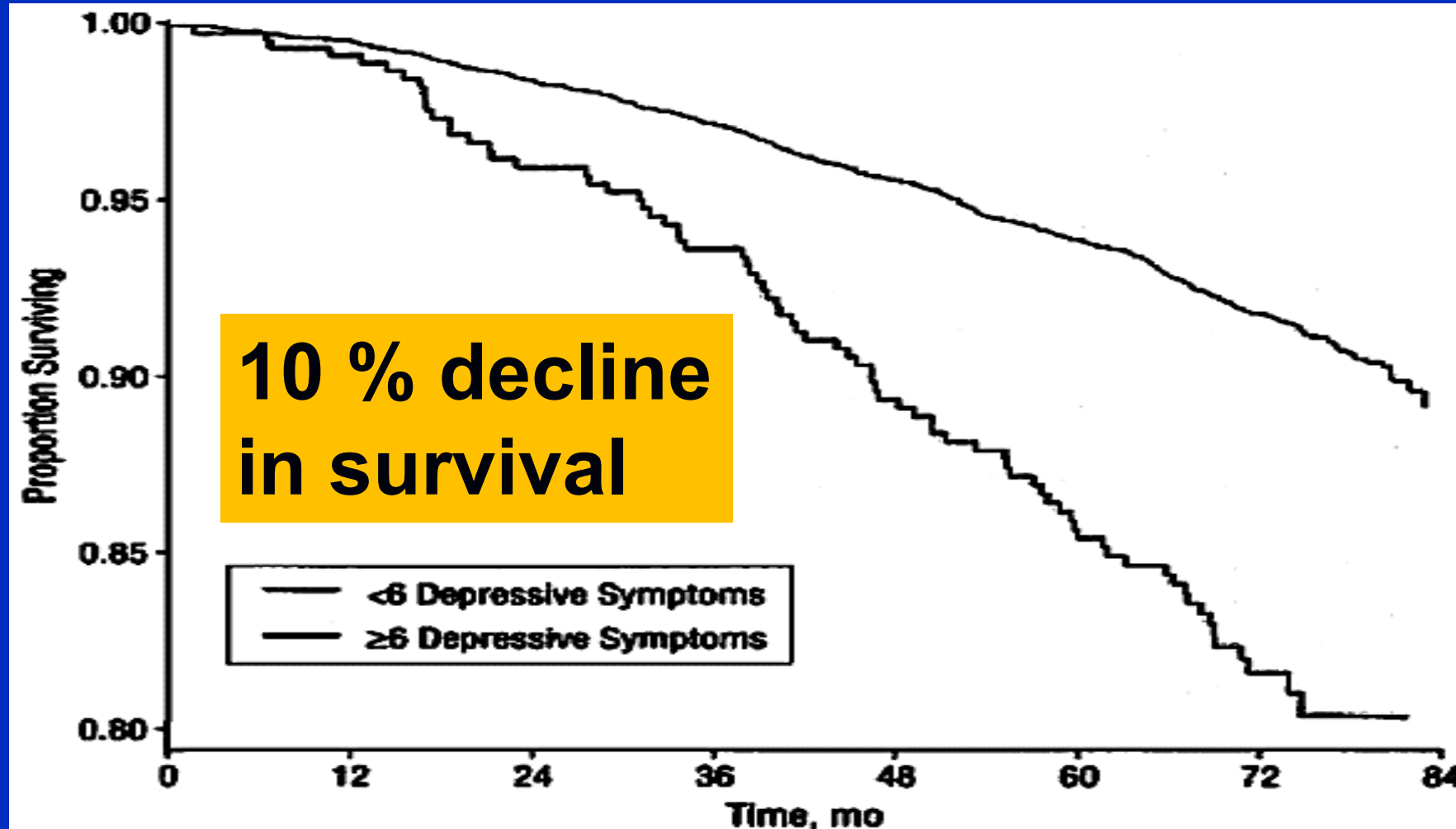
- Multiple somatic complaints
- Fatigue
- Sleep disturbance
- Multiple (> 5 per year) medical visits
- Work or relationship dysfunction
- Multiple worries

# Depression screening, PHQ 2

- Over the past 2 weeks, have you felt down, depressed, or hopeless?
- Over the past 2 weeks, have you felt little interest or pleasure in doing things?

# Depression and mortality

(N = 6176, women, 7 yrs. follow-up)



# Death of spouse associated with increased mortality (1993 Medicare claims data; N=518240 couples)

## Diagnoses of spouse

Cancer

Lung

Colon

Pancreas

CHD

COPD

Dementia

**Husband  
mortality**

5.6%

5.4%

6.9%

6.2%

6.4%

8.6%

**Wife  
mortality**

3.4%

3.0%

3.5%

2.9%

4.1%

5.0%

# Targeted screening for Abdominal aortic aneurisms, AAA

## Recommendations (USPSTF, 2019):

- One time screening

  - Men aged 65-75 who ever smoked

- One time “selective\*” screening

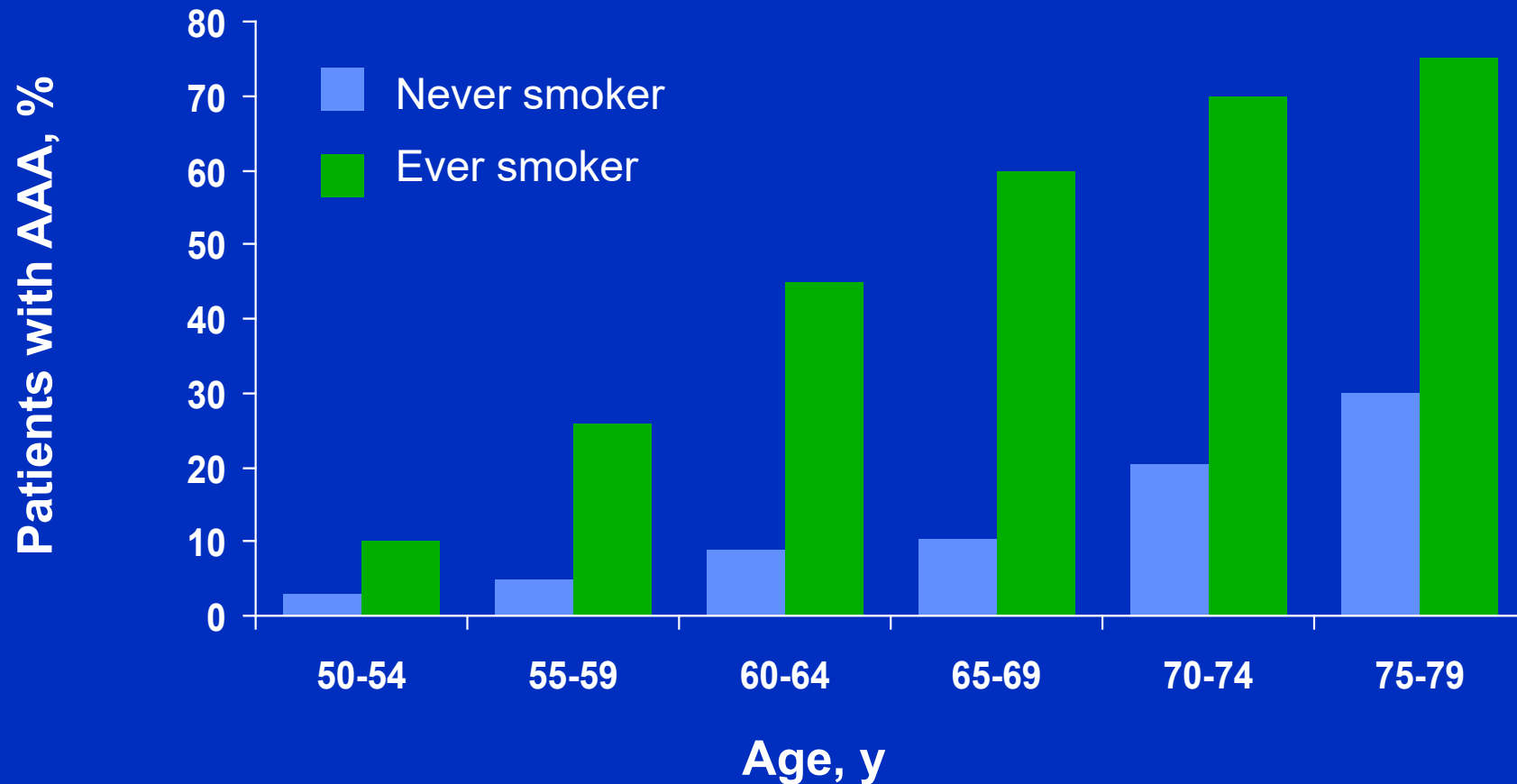
  - ALL men aged 65-75

Current evidence “insufficient” for recommendations  
for women

\*Risk factors: FH, atherosclerosis, HTN

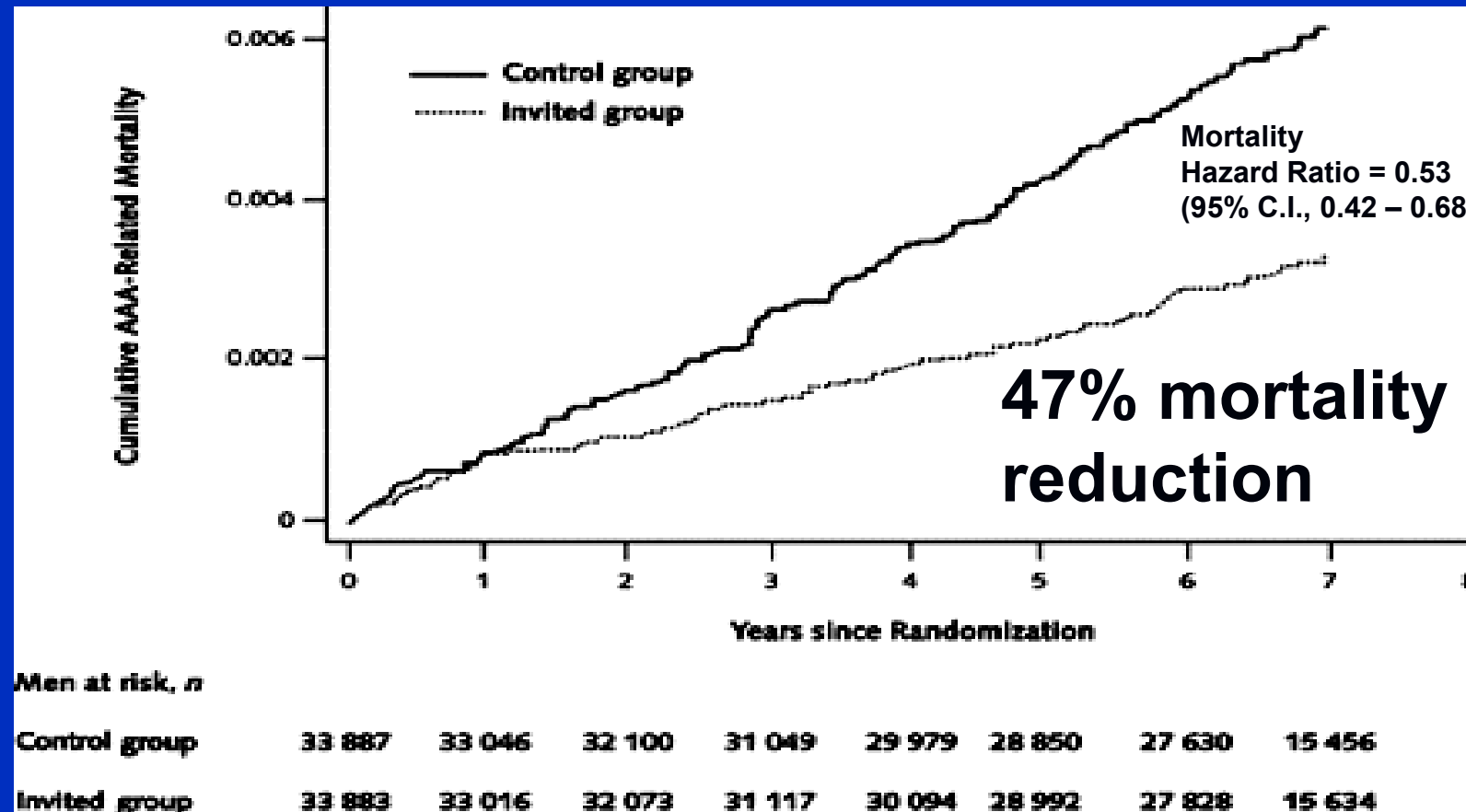
# Abdominal aortic aneurysm

AAA Screening by invitation: Meta-analysis for “ever” smokers (4 RCTs, 65 years and older)



# Abdominal aortic aneurysm

UK RCT of AAA invitation to screening (N=67,770)  
showed a significant drop in AAA mortality



# Dementia/Cognitive impairment

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***“The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for cognitive impairment.”***

# Cognitive impairment without dementia is common

|           | All <u>non-dementia</u><br>Cognitive impairment | Alzheimer's<br>prodrome | Vascular | Medical |
|-----------|-------------------------------------------------|-------------------------|----------|---------|
| 70-79 yrs | 16%                                             | 5.5%                    | 3.4%     | 4.7%    |
| 80-89 yrs | 29.2%                                           | 9.7%                    | 10.1%    | 5.4%    |
| ≥ 90 yrs  | 39%                                             | 22.4%                   | 2.9%     | 9.2%    |

## Annual progression to dementia

|       |       |      |      |
|-------|-------|------|------|
| 11.7% | 20.1% | 6.1% | 6.0% |
|-------|-------|------|------|

# Common medications and effects on cognition

| Medication class            | Examples                                 | Comments                                                                                                   |
|-----------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Tricyclic antidepressants   | Amitriptyline<br>Clomipramine<br>Doxepin |                                                                                                            |
| Certain antipsychotics      | Chlorpromazine<br>Clozapine<br>Pimozide  | Sedation, mental sluggishness                                                                              |
| Long-acting benzodiazepines | Clonazepam<br>Temazepam<br>Diazepam      | Very sedating; caution for gait impairment, dizziness, consider short acting agents: alprazolam, lorazepam |

# Common medications and effects on cognition

| Medication class                                  | Examples                                       | Comments                                                                    |
|---------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|
| Antihistamines,<br>especially first<br>generation | Diphenhydramine<br>Hydroxyzine<br>Promethazine | Anticholinergic adverse<br>effects, urine retention<br>confusion, sedation  |
| Bladder agents                                    | Oxybutynin<br>Rolterodine                      | Anticholinergic adverse<br>effects, urine retention,<br>confusion, sedation |
| Certain pain medications                          | Meperidine<br>Propoxyphene                     | Meperidine: increased<br>risk of seizures with renal<br>impairment          |

# Smoking cessation

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## Recommendations (USPSTF, 2015):

- Ask all adults about tobacco use
- Advise them to stop using tobacco
- Provide behavioral interventions
- Provide pharmacotherapy

# Screening orphans

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- Vision
- Hearing
- Balance
- Injury
- H pylori
- Opioids

# Visual impairment

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**Recommendation (USPSTF, 2016):** Evidence  
“insufficient” to assess.

**American Optometric Association:**  
Annual eye exam for all adults  $\geq 61$  years

**American Academy of Ophthalmology:**  
Annual or biennial eye exam for all adults  $\geq 65$

# Visual impairment prevalent (NHANES 1999-2002; N=13265)

| Group          | Estimated incidence of<br>visual impairment<br>(95% C.I.) | Estimated incidence<br>due to uncorrected<br>refractory error<br>(95% C.I.) |
|----------------|-----------------------------------------------------------|-----------------------------------------------------------------------------|
| Age            |                                                           |                                                                             |
| 40-59          | 4.3% (3.6-5.0%)                                           | 4.0% (3.3-4.7%)                                                             |
| >60            | 8.8% (7.6-10.0%)                                          | 5.2% (4.2-6.3%)                                                             |
| Race/ethnicity |                                                           |                                                                             |
| Black          | 8.4% (7.1-9.7%)                                           | 6.9% (5.9-8.0%)                                                             |
| Hispanic       | 10.7% (8.5-13.0%)                                         | 9.2% (7.0-11.3%)                                                            |
| White          | 5.0% (4.5-5.6%)                                           | 4.1% (3.5-4.1%)                                                             |

# Hearing impairment

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## Consider...

**Ask patients whether others have complained about their hearing...**

**Its always the partner!**

**Hearing loss is profoundly isolating**

**Practice good communication with patients**

# Hearing loss is prevalent (National Health and Nutrition Examination Study, 1999-2004, N=31,126 age 20-69)

|     |              | Speech frequency<br>HL | High frequency<br>HL |
|-----|--------------|------------------------|----------------------|
| Sex | Male         | 21%                    | 45%                  |
|     | Female       | 11%                    | 19%                  |
| Age | 20-29        | 3.1%                   | 8.5%                 |
|     | 30-39        | 5.4%                   | 17.0%                |
|     | <b>40-49</b> | <b>15.0%</b>           | <b>34.0%</b>         |
|     | <b>50-59</b> | <b>29.0%</b>           | <b>53.0%</b>         |
|     | <b>60-69</b> | <b>49.0%</b>           | <b>77.0%</b>         |

# Hearing loss: Beware of noise exposure, be careful

| Loud noise<br>Occupation | Speech frequency<br>HL | High frequency<br>HL |
|--------------------------|------------------------|----------------------|
|--------------------------|------------------------|----------------------|

|            |              |              |
|------------|--------------|--------------|
| No         | 13.0%        | 27.0%        |
| <b>Yes</b> | <b>21.0%</b> | <b>43.0%</b> |

Leisure fire arm

|            |              |              |
|------------|--------------|--------------|
| No         | 15.0%        | 30.0%        |
| <b>Yes</b> | <b>28.0%</b> | <b>53.0%</b> |

# Balance and vestibular dysfunction

---

**Consider...**

**Have patients stand with eyes open or closed**

**Watching for the “sway” or wobble with turning**

# Balance and/or vestibular dysfunction (NHANES 2001-04, N = 5086)

## Age group

40-49 yrs

50-59 yrs

**60-69 yrs**

**70-79 yrs**

**> 80 yrs**

## Prevalence of “vestibular” dysfunction

18.5%

33.0%

**49.4%**

**68.7%**

**84.8%**

\*Stand with eyes closed and achieve stability

# Injury prevention\*

|  | Unintentional | Homicides | Suicide | Total |
|--|---------------|-----------|---------|-------|
|--|---------------|-----------|---------|-------|

|                      |             |            |  |             |
|----------------------|-------------|------------|--|-------------|
| <b>Motor vehicle</b> | <b>16.2</b> | <b>0.1</b> |  | <b>16.4</b> |
|----------------------|-------------|------------|--|-------------|

|          |      |   |  |      |
|----------|------|---|--|------|
| Occupant | 13.0 | 0 |  | 13.0 |
|----------|------|---|--|------|

|            |     |     |  |     |
|------------|-----|-----|--|-----|
| Pedestrian | 2.4 | 0.1 |  | 2.5 |
|------------|-----|-----|--|-----|

|              |     |  |  |     |
|--------------|-----|--|--|-----|
| Motorcyclist | 0.7 |  |  | 0.7 |
|--------------|-----|--|--|-----|

|                |            |            |            |             |
|----------------|------------|------------|------------|-------------|
| <b>Firearm</b> | <b>0.5</b> | <b>6.9</b> | <b>7.2</b> | <b>14.8</b> |
|----------------|------------|------------|------------|-------------|

\* Deaths/100,000 person years

# Practices associated with reduced gun shot risk for youth

(Case control study: 106 cases,<sup>+</sup> 480 controls<sup>++</sup>)

|                          | Risk reduction |         |
|--------------------------|----------------|---------|
|                          | Unintentional  | Suicide |
| Gun unloaded             | 79%            | 61%     |
| Gun locked               | 74%            | 73%     |
| Ammunition locked        | 65%            | 60%     |
| Separated gun/ammunition | 40%            | 44%     |

<sup>+</sup> Cases = 37 counties, youth related gun violence.

<sup>++</sup> Controls = Random phone access in community.

# H pylori screening and treatment

---

## Recommendation:

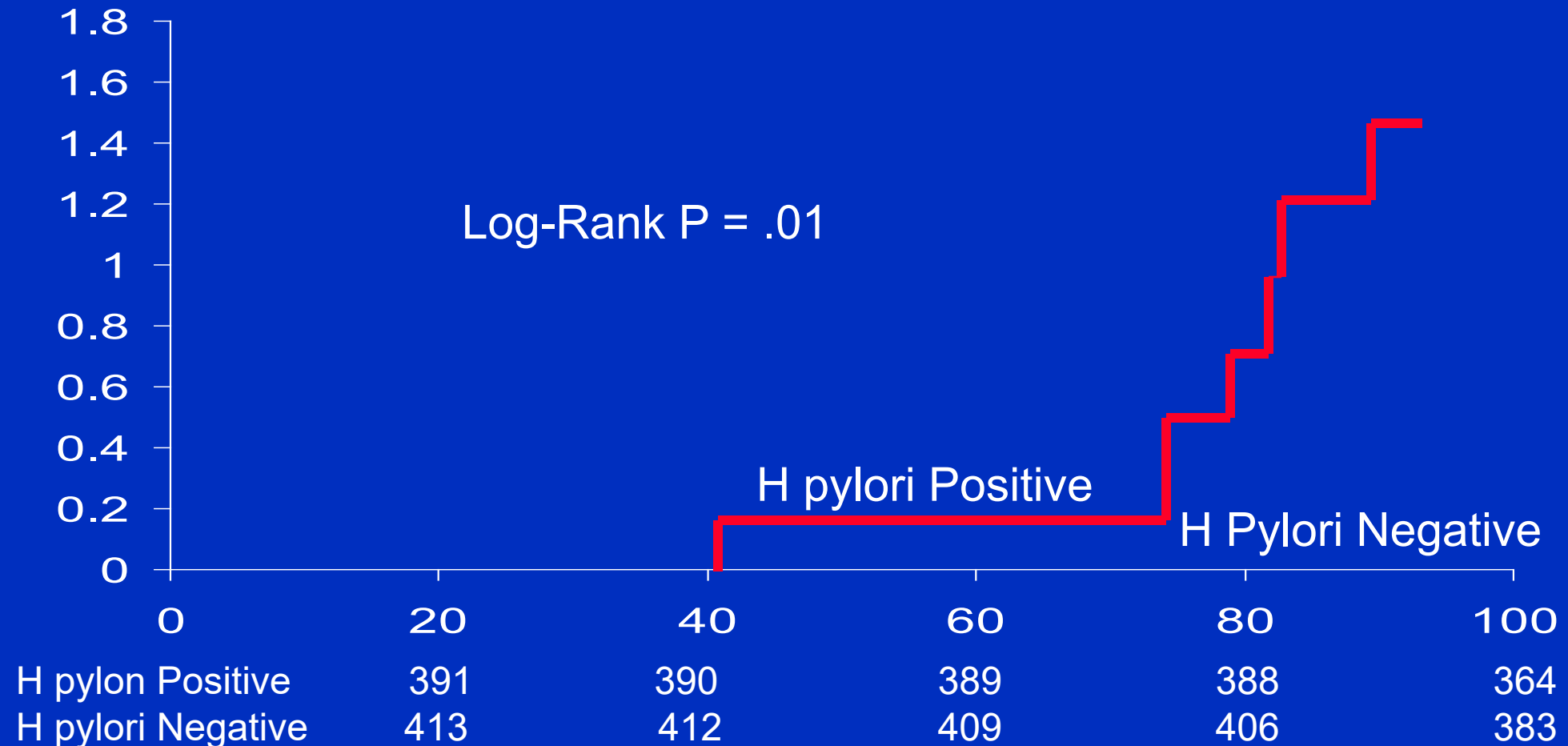
**Consider checking for H. pylori infection, treat if present.**

Meta-analysis of published RCTs showed a 34% reduction in gastric cancer among those treated

NNT ranged from 15 for Chinese men to 245 for American women

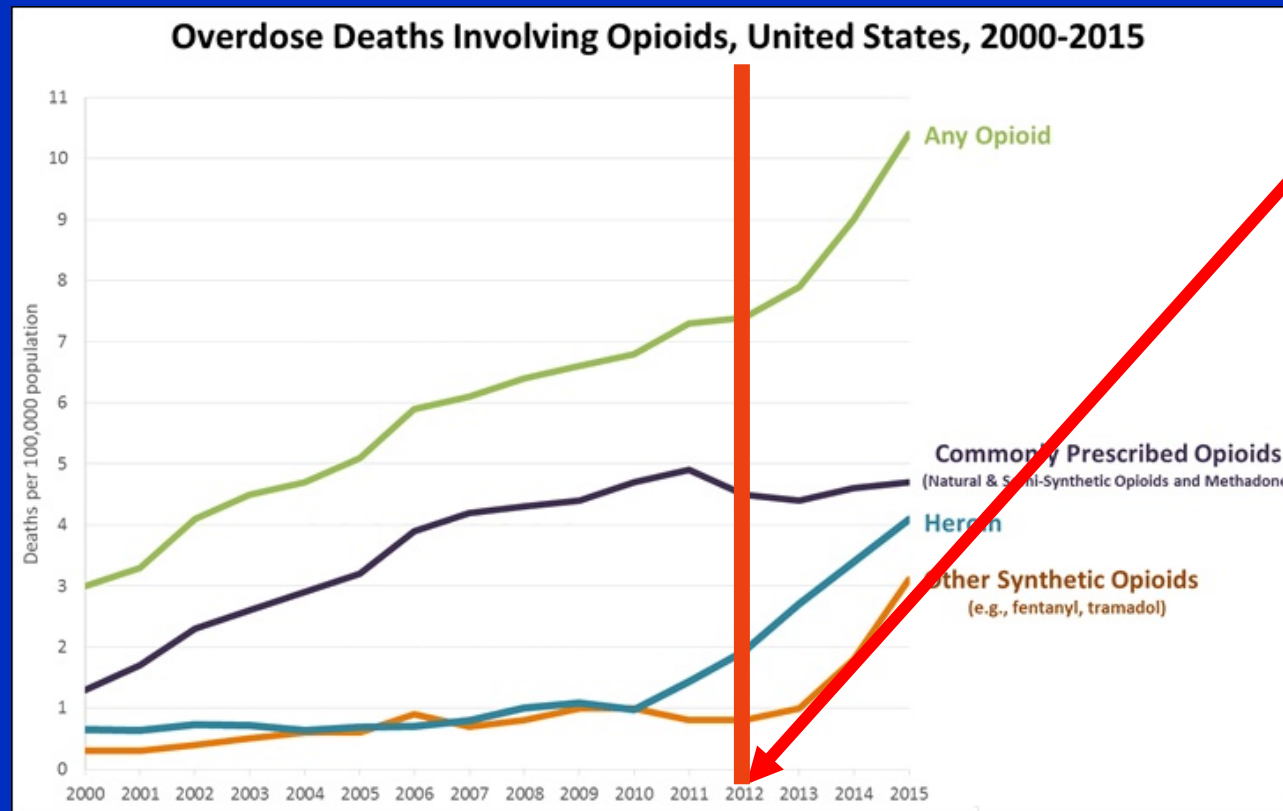
# H. pylori infection eliminated gastric cancer risk in patients without baseline gastric abnormalities

Chinese cohort, N=804, 7.5 years follow-up



# Opioids

We have only begun to understand the dimensions of this crisis...



2013

# Health promotion



# Immunizations

## Historical comparisons for vaccine preventable disease

|            | Peak year pre vaccine deaths (year) | 2004 deaths |
|------------|-------------------------------------|-------------|
| Diphtheria | 3065 (1936)                         | 0           |
| Measles    | 522 (1958)                          | 0           |
| Mumps      | 50 (1964)                           | 0           |
| Pertussis  | 7518 (1934)                         | 27          |
| Polio      | 2720 (1949)                         | 0           |
| Rubella    | 24 (1968)                           | 0           |
| Small pox  | 2510 (1902)                         | 0           |
| Tetanus    | 511 (1947)                          | 4           |

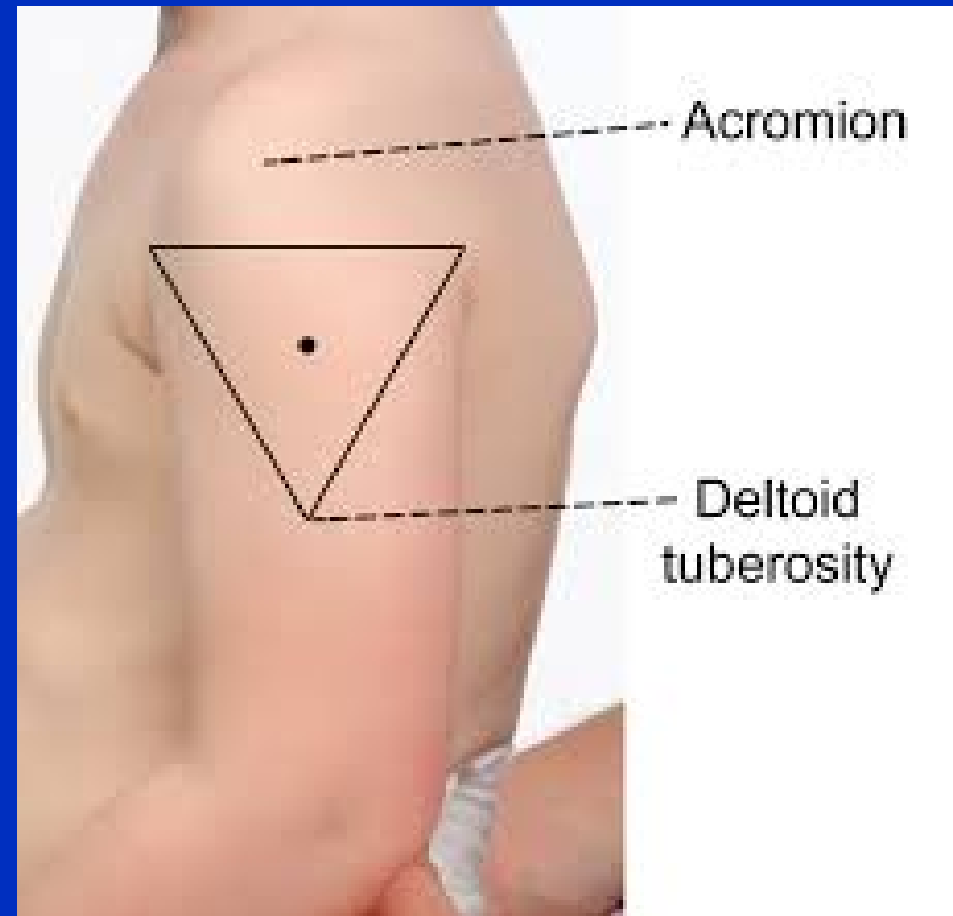
# Estimated duration of antigen specific antibody production

Years 94% C.I.)

Tetanus  
Diphtheria  
VZV  
Vaccinia  
Rubella  
Mumps  
Measles

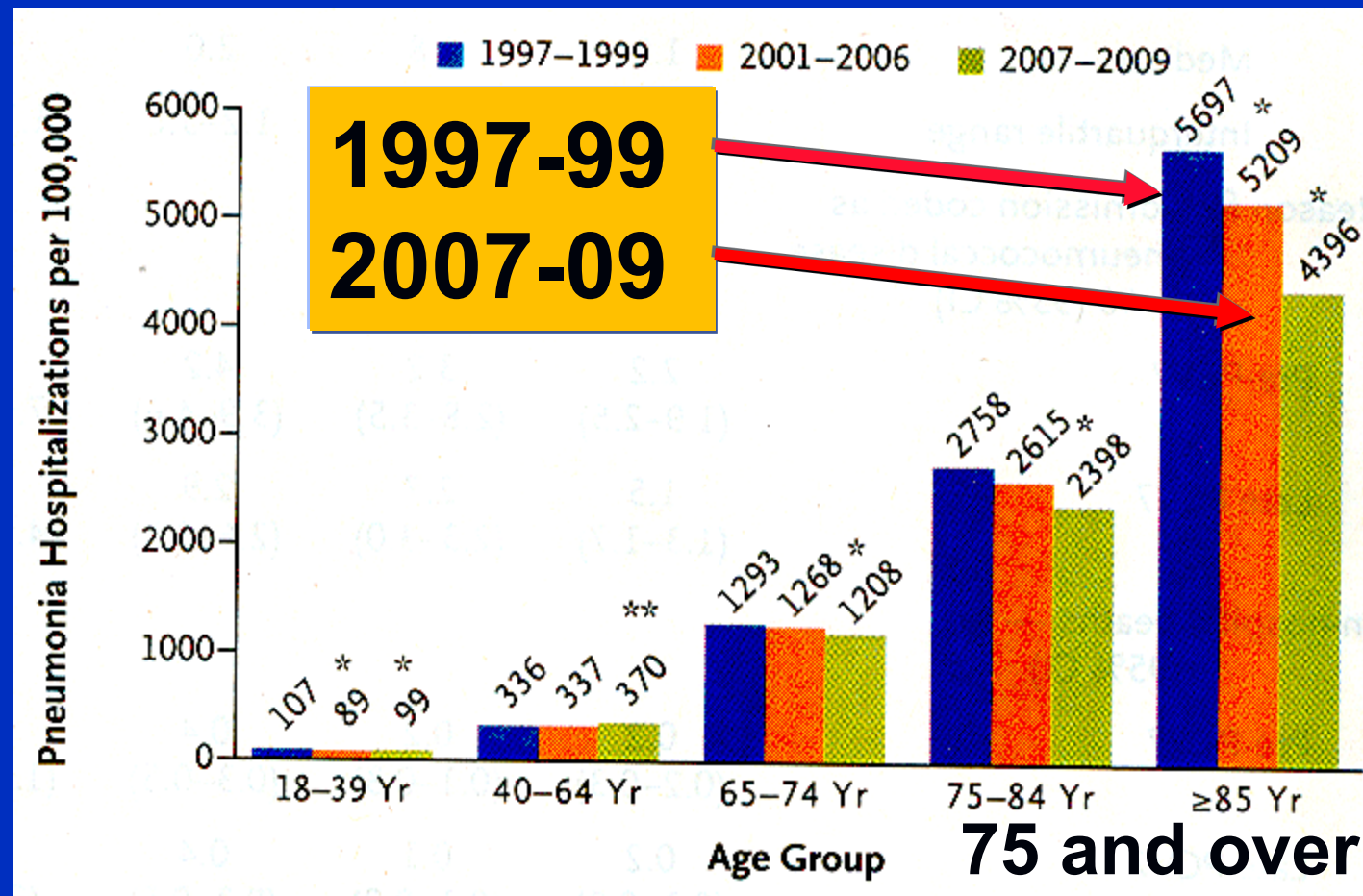
11 (10-14)  
19 (14-33)  
50 (30-153)  
92 (46-infinity)  
114 (48-infinity)  
542 (90-infinity)  
3,014 (104-infinity)

# Immunizations



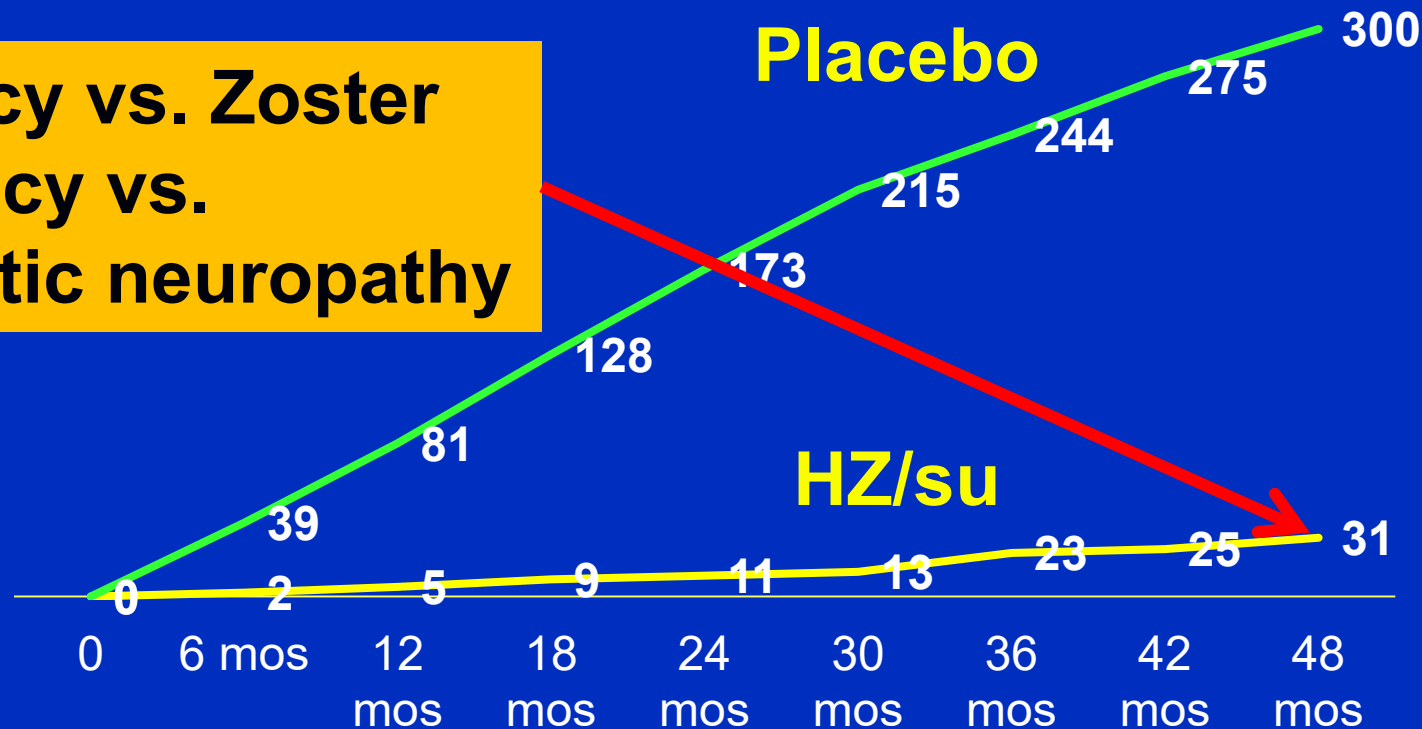
# Pneumovax use associated with lower pneumonia hospitalization

US hospitalizations for pneumonia



# Herpes zoster subunit vaccine (HZ/su), recombinant glycoprotein E with AS01b adjuvant, 2 shots, 0 and 2 months (N = 13,900, mean age 75.6, 18 countries)

**91.3% efficacy vs. Zoster**  
**88.8 % efficacy vs.**  
**post herpetic neuropathy**



**Cases of  
shingles**

# HPV Vaccine eliminated abnormal PAPs

Serotypes 16, 18, 6 and 11 (16 and 18 account for 70% cervical cancer, 6 and 11 account for 90% of genital warts). Given at 0, 1 month and 6 months

(RCT N = 10559, women aged 16-26 years; 2 yrs follow-up)

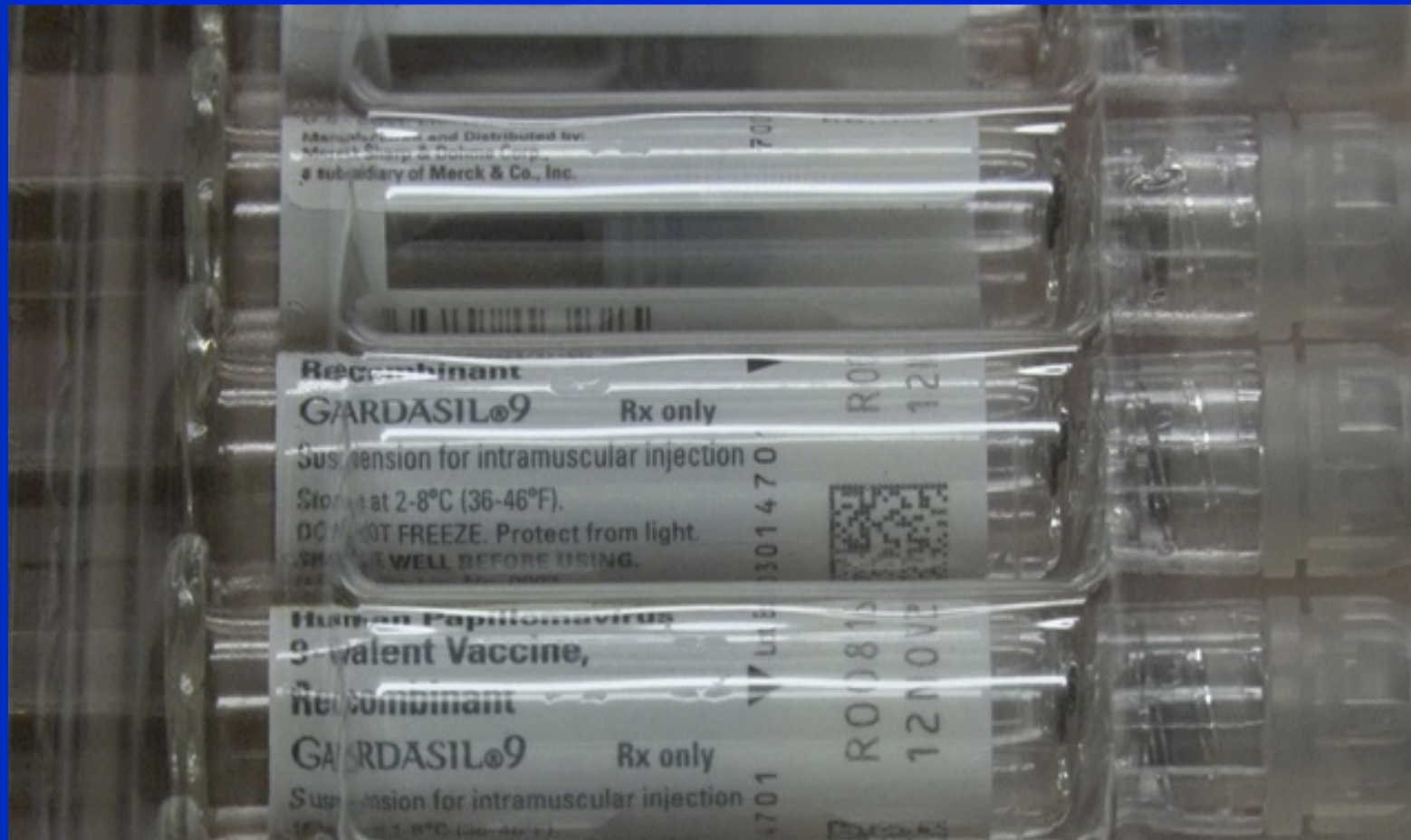
## PAP Outcomes

|                                          | Vaccine<br>(N=5301) | Placebo<br>(N=5258) |
|------------------------------------------|---------------------|---------------------|
| CIN <sup>+</sup> 2/3 or AIS <sup>*</sup> | 0                   | 21                  |

+ CIN = Cervical intraepithelial neoplasia

\* AIS = Adenocarcinoma in situ

# October 2018: FDA approves HPV vaccination through age 45



# Vitamins have no benefit for mortality

## USPSTF Meta-analysis

---

|               | Risk reduction (95% CI) |
|---------------|-------------------------|
| MVI           | 0.95 (0.89-1.01)        |
| Beta carotene | 1.05 (0.98-1.04)        |
| Selenium      | 0.97 (0.88-1.08)        |
| Vitamin A     | 1.15 (0.81-1.65)        |
| Vitamin C     | 1.06 (0.97-1.16)        |
| Folic acid    | 0.52 (0.24-1.10)        |
| Vitamin D     | 0.94 (0.87-1.01)        |
| Calcium       | 1.04 (0.96-1.12)        |

# Vitamins in select situations

## Vitamins in the healthy population

Pregnancy: Folic acid, prenatal vitamin

Infants and children: Vitamin D if breastfeeding, Iron  
age 4-6 mos.

Midlife and older adults: Possibly B12, D, calcium

## High risk subgroups

Bariatric surgery: A, D, K, E, B vitamins, iron, calcium, zinc,  
copper, multivitamin/multimineral

Crohn's disease and IBDs: B vitamins, zinc, magnesium

Proton pump inhibitors: B12, calcium, magnesium

Metformin: B12

# Hormonal replacement

---

**Estrogen:** Hormone replacement therapy (HRT)

- Women's Health Initiative (2002) data showed that the value in reducing risk for hip fracture and colon cancer prevention offset by higher risks for breast cancer, stroke, MI and PE.
- However, 2017 follow up did not show a decline in mortality.
- USPSTF recommended against

**Testosterone:** Much to be learned

# WHI: A new narrative: The 18 year follow-up report hazzard ratios vs. placebo

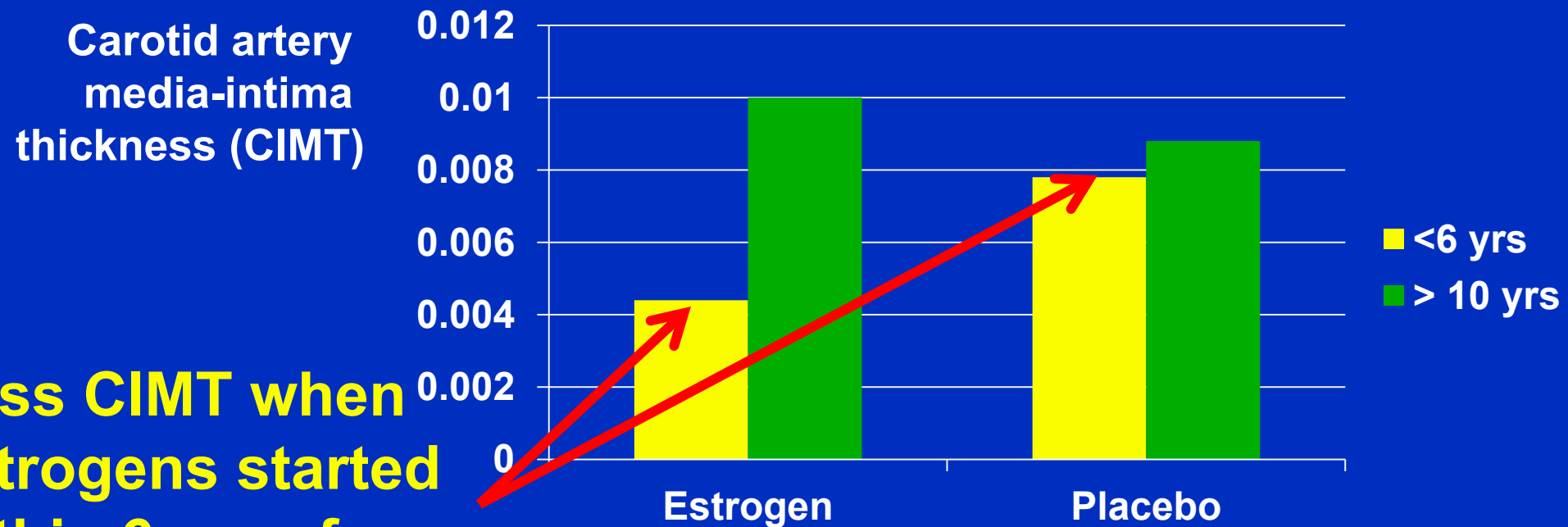
|                         | Estrogen plus progestin | Estrogen alone |
|-------------------------|-------------------------|----------------|
| All cause mortality     | 1.02 (NS)               | 0.94 (NS)      |
| CVD mortality           | 1.03 (NS)               | 0.97 (NS)      |
| Stroke mortality        | 1.12 (NS)               | 0.98 (NS)      |
| Cancer mortality        | 1.06 (NS)               | 0.99 (NS)      |
| Breast cancer mortality | 1.44 (0.07)             | 0.55 (0.02)    |
| Dementia mortality      | 0.93 (NS)               | 0.74 (0.01)    |
| Colorectal CA mortality | 1.01 (NS)               | 1.21 (NS)      |

# 2017 USPSTF harms vs. risks: Estrogen and progestin

| Outcome                | Events per 10,000 pt yrs. (95% C.I.) |
|------------------------|--------------------------------------|
| <b>HARMS</b>           |                                      |
| Breast CA              | 9 (1-19)                             |
| CAD                    | 8 (0-18)                             |
| GB disease             | 21 (4-53)                            |
| CVA                    | 9 (2-19)                             |
| Venous thromboembolism | 21 (12-33)                           |
| <b>BENEFITS</b>        |                                      |
| Diabetes prevented     | 14 (3-24)                            |
| Fracture prevented     | 44 (13-71)                           |
| Colon CA prevented     | 6 (1-9)                              |

# Estrogens administered in the first 6 yrs following menopause slowed carotid artery media-intima thickening; estrogens administered >10 yrs did not

(RCT, N = 643, 5 yr follow-up, E or E+P vs. placebo)



Less CIMT when estrogens started within 6 yrs of menopause

# Aspirin (>75 mg per day)

---

## Recommendations (USPSTF, 2016):

Age 50-59: Low dose aspirin if 10% or greater 10 year risk for CV disease, 10 year life expectancy and not high risk for GI bleeding.

Age 60-69: Individualized

Age 70 and above: Insufficient evidence

# 2016: USPSTF summary benefits from aspirin

|                   | Benefits, prevented events for each<br>1000 patient years (100 patients for 10 years) |      |              |              |             |                      |
|-------------------|---------------------------------------------------------------------------------------|------|--------------|--------------|-------------|----------------------|
| Age of initiation | MI                                                                                    | CVA  | CVD<br>event | CVD<br>death | Colon<br>CA | Colon<br>CA<br>death |
| Men 50-59         | 22.5                                                                                  | 8.4  | 37.2         | 4.1          | 13.9        | 3                    |
| Men 60-69         | 15.9                                                                                  | 6.6  | 26.6         | 3.3          | 11.2        | 2.6                  |
| Women 50-59       | 14.8                                                                                  | 13.7 | 35.8         | 3.9          | 13.9        | 3.6                  |
| Women 60-69       | 10.1                                                                                  | 11.6 | 26.7         | 3.1          | 10.5        | 2.7                  |

# Aspirin benefits vs. harms

|                      | Harms, events for each<br>1000 patient years (100 patients for 10 years) |                        |           |                      |
|----------------------|--------------------------------------------------------------------------|------------------------|-----------|----------------------|
| Age of<br>initiation | GI bleed                                                                 | GI bleed<br>with death | CNS bleed | Net quality<br>years |
| Men 50-59            | 28.4                                                                     | 1.8                    | 2.3       | 58.8                 |
| Men 60-69            | 31.4                                                                     | 2.2                    | 3.1       | 18                   |
| Men 70-79            |                                                                          |                        |           | -1.0                 |
| Women 50-59          | 20.9                                                                     | 1.4                    | 3.5       | 62.1                 |
| Women 60-69          | 23                                                                       | 2.1                    | 3.2       | 28.4                 |
| Women 70-79          |                                                                          |                        |           | -4.4                 |

# 2018: The aspirin debate heated up!

## *The* NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

OCTOBER 18, 2018

VOL. 379 NO. 16

### Effect of Aspirin on Disability-free Survival in the Healthy Elderly

J.J. McNeil, R.L. Woods, M.R. Nelson, C.M. Reid, B. Kirpach, R. Wolfe, E. Storey, R.C. Shah, J.E. Lockery, A.M. Tonkin, A.B. Newman, J.D. Williamson, K.L. Margolis, M.E. Ernst, W.P. Abhayaratna, N. Stocks, S.M. Fitzgerald, S.G. Orchard, R.E. Trevaks, L.J. Beilin, G.A. Donnan, P. Gibbs, C.I. Johnston, J. Ryan, B. Radziszewska, R. Grimm, and A.M. Murray, for the ASPREE Investigator Group\*

ABSTRACT

### ORIGINAL ARTICLE

### Effect of Aspirin on All-Cause Mortality in the Healthy Elderly

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ABSTRACT

### ORIGINAL ARTICLE

### Effects of Aspirin for Primary Prevention in Persons with Diabetes Mellitus

The ASCEND Study Collaborative Group\*

ABSTRACT

# What does the data show for healthy adults?

N = 19114, Australia (87.4%) and US. 59% non-frail, 56% women, 74% HTN, 11% DM, 65% dyslipidemia. 50%  $\geq$  74 yrs.  
RCT of ASA 100 mg/d vs. placebo, 4.7 yrs. follow-up

|                    | Aspirin                  | Placebo                  | Hazard ratio | P value |
|--------------------|--------------------------|--------------------------|--------------|---------|
|                    | Rate per 1000 person-yr. | Rate per 1000 person-yr. |              |         |
| CV disease         | 10.7                     | 11.3                     | 0.95         | NS      |
| Fatal CV event     | 1.8                      | 1.9                      | 0.97         | NS      |
| MI                 | 4.0                      | 4.3                      | 0.93         | NS      |
| Major hemorrhage   | 8.6                      | 6.2                      | 1.38         | < 0.001 |
| Intracranial bleed | 2.5                      | 1.7                      | 1.50         | ? ?     |
| Upper GIB          | 2.1                      | 1.1                      | 1.87         | ??      |
| Lower GIB          | 1.7                      | 1.3                      | 1.36         | NS      |

# What about patients with diabetes?

N = 15480, UK. Age 63 +/-9 yrs. 94% Type 2 DM. 17% high vascular score, 63% men.

RCT of ASA 100 mg/d vs. placebo, 7.4 yrs. follow-up

|                             | Aspirin | Placebo | Risk ratio | P value |
|-----------------------------|---------|---------|------------|---------|
|                             | Percent | Percent |            |         |
| Any serious vascular event* | 8.5     | 9.6     | 0.88       | 0.01    |
| Non fatal MI                | 2.5     | 2.5     | 0.98       | NS      |
| TIA                         | 2.2     | 2.5     | 0.85       | NS      |
| Any major bleed             | 4.1     | 3.2     | 1.29       | 0.003   |
| Intracranial bleed          | 0.7     | 0.6     | 1.22       | NS      |
| Any GIB                     | 1.8     | 1.3     | 1.36       | ??      |
| Other major bleeding        | 1.0     | 0.6     | 1.36       | ??      |

\*excluding TIAs

NEJM 2018;379:1529-1540

# What about patients with diabetes?

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|-----------------------------|---------|---------|------------|---------|
|                             | Percent |         |            |         |
| Any serious vascular event* | 8.5     |         | 0.88       | 0.01    |
| Non fatal MI                | 2.5     |         | 0.98       | NS      |
| TIA                         | 2.2     |         | 0.85       | NS      |
| Any major bleed             | 4.1     |         | 1.29       | 0.003   |
| Intracranial bleed          | 0.7     |         | 1.22       | NS      |
| Any GIB                     | 1.8     |         | 1.36       | ??      |
| Other major bleeding        | 1.0     | 0.6     | 1.36       | ??      |

**For adults with diabetes:  
12% reduction  
in vascular events  
vs. 29% increase  
in bleeding**

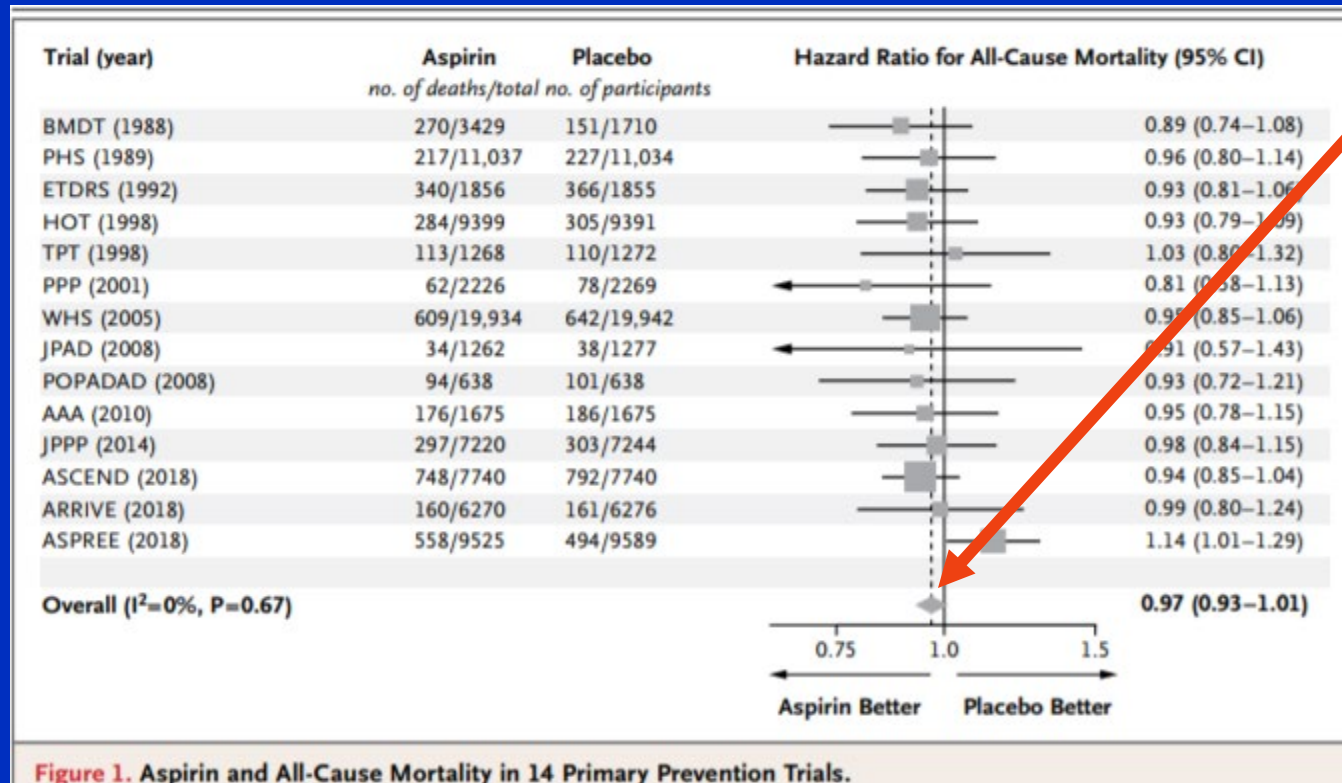
\*excluding TIAs

NEJM 2018;379:1529-1540



## Should Aspirin Be Used for Primary Prevention in the Post-Statins Era?

Paul M Ridker, M.D., M.P.H.

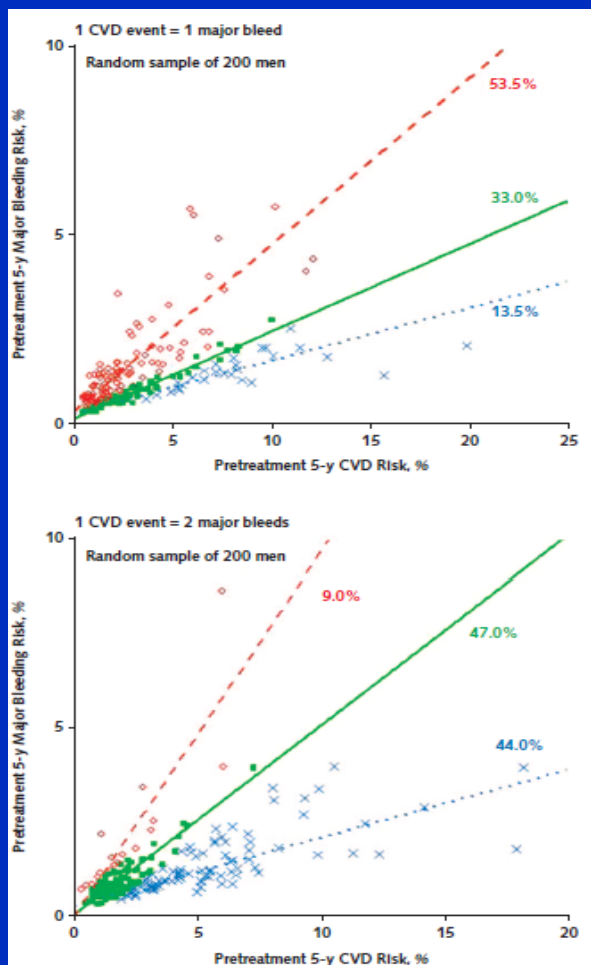


Overall, studies (14) point to better outcomes with aspirin but the data is mixed, the benefit modest

Figure 1. Aspirin and All-Cause Mortality in 14 Primary Prevention Trials.

# What if one CV event prevented = two GI bleeding episodes?

(NZ cohort, N = 245,028, ages 30-79 yrs., calculated benefit over 5 years)



**If one CVD event = 1 major bleed  
53.5% men harmed vs. 13.5% benefitted  
82% women harmed vs. 3% benefitted**

**If one CVD event = 2 major bleeds  
9% men harmed vs. 44% benefitted  
9% women harmed vs. 23.5% benefitted**

# Endocarditis prevention

---

**Bacteremia resulting from daily activities is much more likely to cause IE** than bacteremia associated with a dental procedure.

**Only an extremely small number of cases of IE might be prevented by antibiotic prophylaxis** even if prophylaxis is 100% effective.

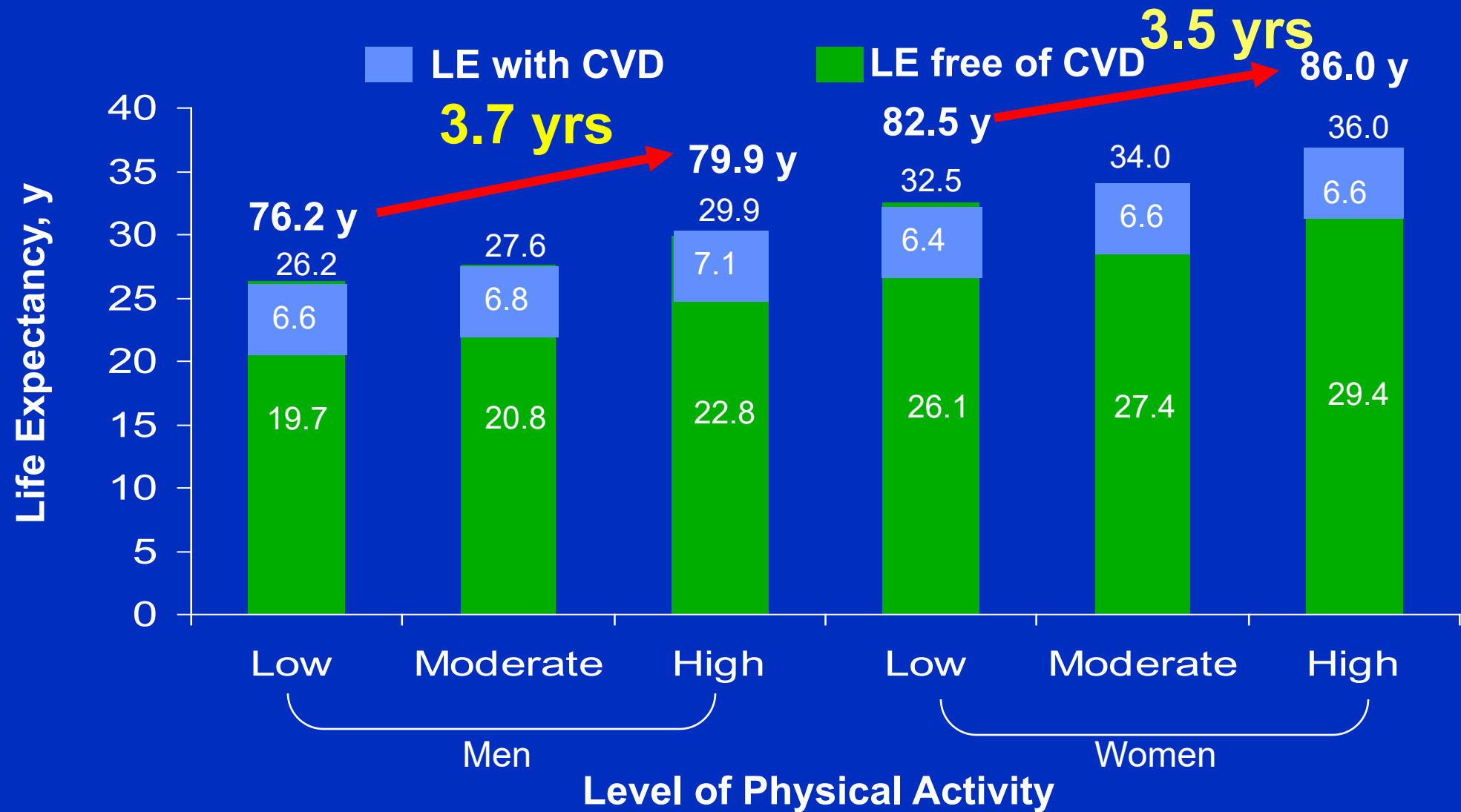
Antibiotic prophylaxis is not recommended based solely on an increased lifetime risk of acquisition of IE.

# Healthy lifestyle choices

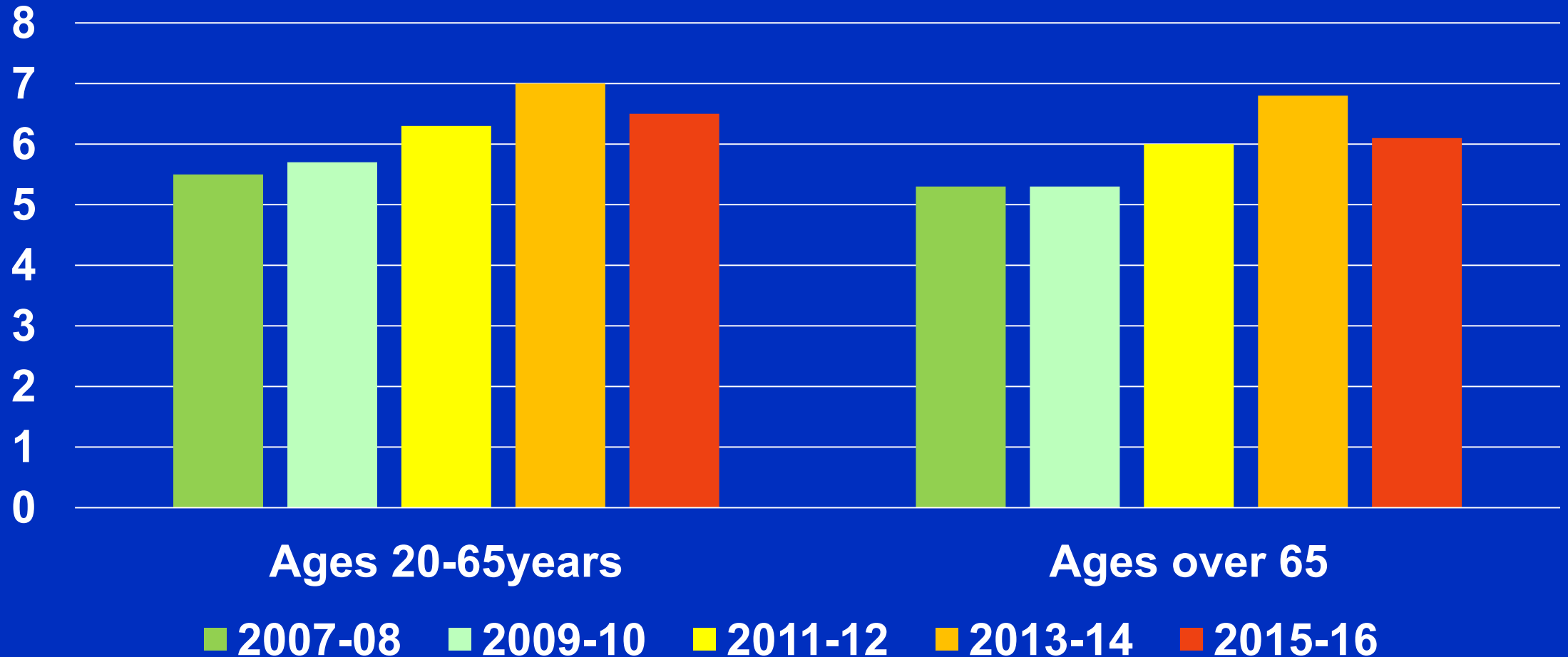


- Diet
- Exercise
- Sleep
- Work hours

# Framingham cohort data: Association of exercise with increased life expectancy over age 50



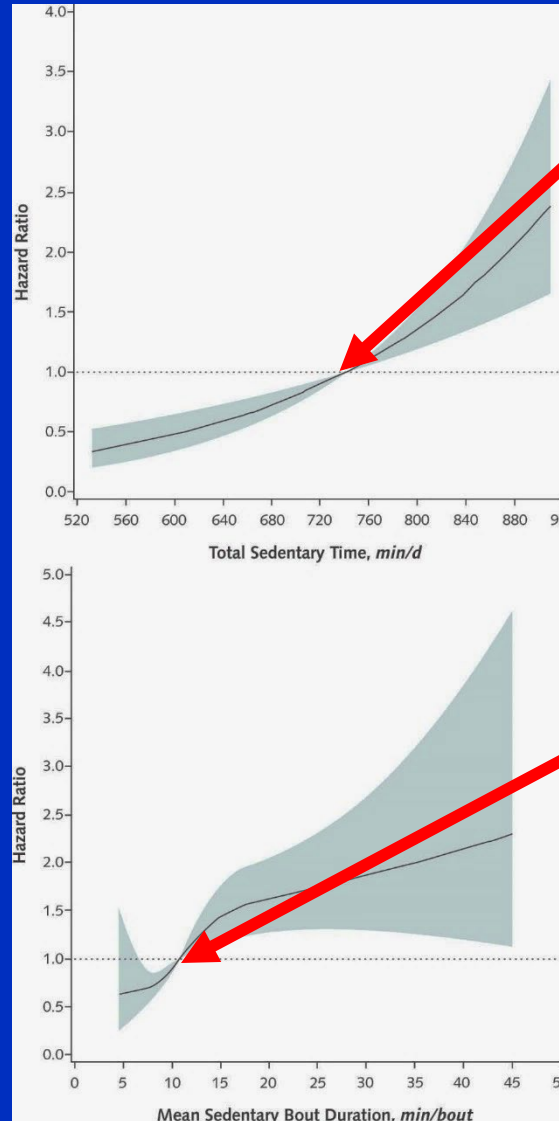
# 10 year trend in sitting time: We are sitting one more sitting hour per day



# What about sedentary behaviors?

- Cohort study of 7985 adults
- Hip mounted accelerometer
- 4 yr. follow-up
- All cause mortality

Hazard ratios



**Risk increased at  
> 12 hours/day**

**Risk increased for  
> 10 minutes of  
sustained sedentary  
behavior**

# High levels of leisure-time physical activity associated with lower levels of cancer

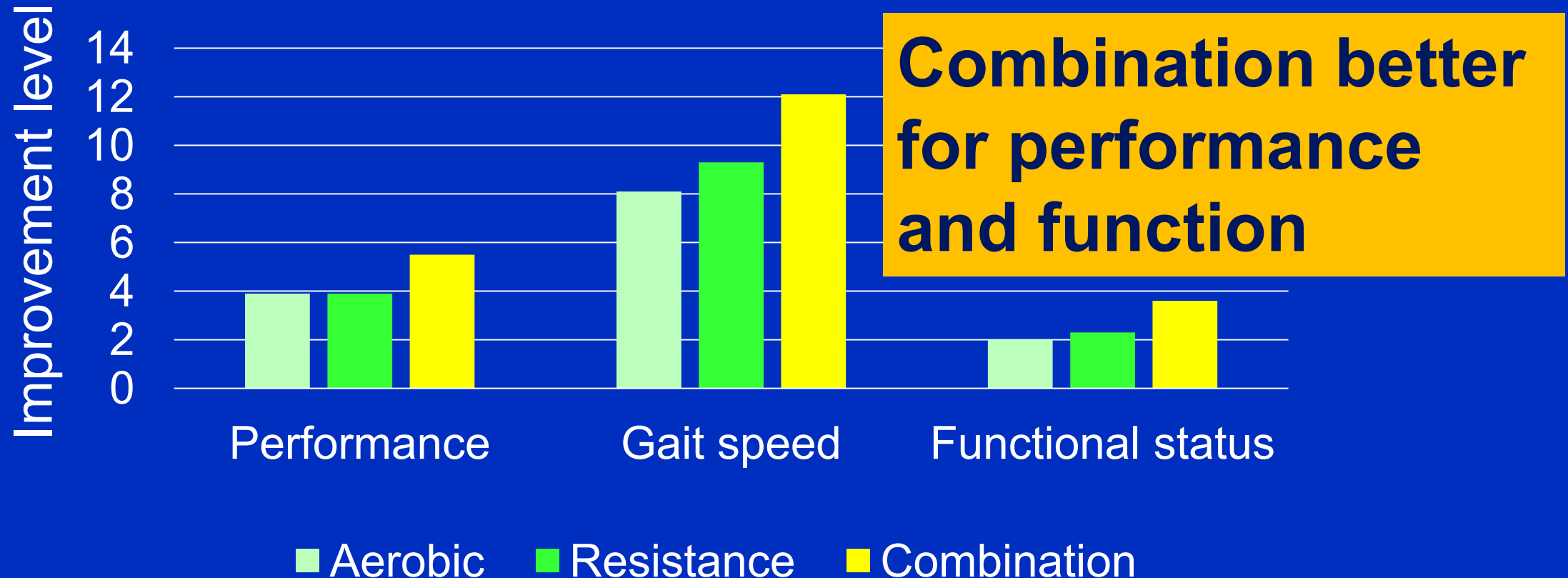
(Meta-analysis, N = 1.44 M, med age 59 yr, > 10 yrs follow-up, US and EU)

| Cancer risk reduction, top 10% vs. lowest 10%, BMI adjusted |                    |
|-------------------------------------------------------------|--------------------|
| Cancer type                                                 | Reduction observed |
| Esophageal adenocarcinoma                                   | 38%                |
| Lung cancer                                                 | 27%                |
| Liver cancer                                                | 19%                |
| Kidney cancer                                               | 16%                |
| Myeloid leukemia                                            | 13%                |
| Colon cancer                                                | 13%                |
| Head and neck cancer                                        | 15%                |
| Rectal cancer                                               | 12%                |
| Bladder cancer                                              | 12%                |
| Breast cancer                                               | 7%                 |

# What is the best exercise: aerobic, resistance, combination?

(N=160, 6 months, obese (BMI 35-37), RCT, 3 times a week)

- Aerobic (minutes): 10 flexibility, 40 aerobic, 10 balance
- Resistance (minutes): 10 flexibility, 40 resistance, 10 balance
- Combination (minutes): 10 flexibility, 30 aerobic, 30 resistance, 10 balance



# Current US Adult Fitness Guidelines

- Move more, sit less.
- Something is better than nothing.
- 150-300 minutes per week of moderate intensity (“brisk walking”)

--OR--

75-150 minutes per week of vigorous intensity (“running or jogging”)

- More is better
- Muscle strengthening 2 or more days per week adds benefit

# What about 10,000 steps per day?

## 4400 is enough!

(WHS Cohort study, 18,289 women ave. age 72 yrs.  
4.3 yrs. follow-up)

| Steps per day             | Mortality reduction |
|---------------------------|---------------------|
| Quartile # 1 = 2718 steps | 1.0                 |
| Quartile # 2 = 4363 steps | 31%                 |
| Quartile # 3 = 5905 steps | 46%                 |
| Quartile # 4 = 8442 steps | 58%                 |

# Putting it all together to preserve your brain

JAMA | **Original Investigation**

## Association of Cardiovascular Health Level in Older Age With Cognitive Decline and Incident Dementia

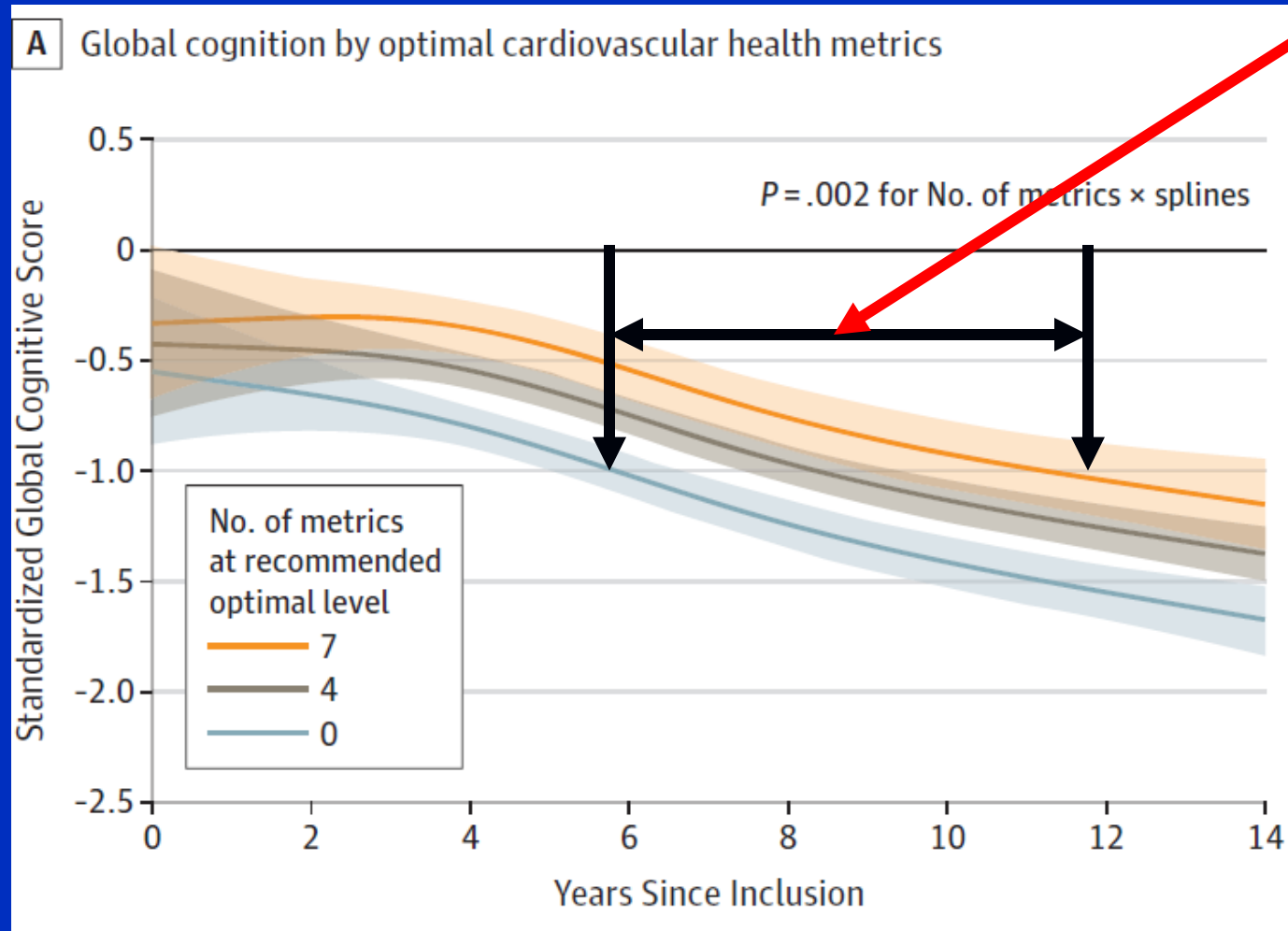
Cécilia Samieri, PhD; Marie-Cécile Perier, MSc; Bamba Gaye, PhD; Cécile Proust-Lima, PhD;  
Catherine Helmer, MD, PhD; Jean-François Dartigues, MD, PhD; Claudine Berr, MD, PhD;  
Christophe Tzourio, MD, PhD; Jean-Philippe Empana, MD, PhD

French cohort: N = 6626, average age 73.7 yrs., normal baseline cognition, 63.4% women, 8.5 years follow-up.  
Neurocognitive testing every 2-3 years  
CV and lifestyle risk factors measured

# What are the choices to be made?

| Metric                       | Recommended Optimal Level                                                                                                   | Intermediate Level                                                                                                 | Poor Level                                                                                                    |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Smoking                      | Never or quit $\geq 12$ mo prior                                                                                            | Quit $< 12$ mo                                                                                                     | Current smokers                                                                                               |
| Physical activity            |                                                                                                                             |                                                                                                                    |                                                                                                               |
| Montpellier and Dijon sites  | Recreational walking $\geq 2$ h per d or practicing sport $\geq 2$ times per wk                                             | Recreational walking 1 to 2 h per d or practicing sport monthly to weekly                                          | Recreational walking $< 1$ h per d or no sport practice                                                       |
| Bordeaux site                | Recreational walking $\geq 8$ h per wk or having $\geq 4$ h of sport or intensive leisure activity per wk                   | Recreational walking 2 to 8 h per wk or having 1 to 3 h of sport or intensive leisure activity per wk              | Recreational walking $\leq 1$ h per wk or having $< 1$ h of sport or intensive leisure activity per wk        |
| Healthy diet                 | $\geq 1$ Portion per d of each of fresh fruit, raw vegetables, cooked fruit/vegetables and $\geq 2$ portions per wk of fish | $\geq 1$ Portion per d of fresh fruit, raw vegetables, cooked fruit/vegetables or $\geq 2$ portions per wk of fish | $< 1$ portion per d of fresh fruit, raw vegetables, cooked fruit/vegetables and $< 2$ portions per wk of fish |
| Body mass index <sup>b</sup> | $< 25$                                                                                                                      | 25-29.9                                                                                                            | $\geq 30$                                                                                                     |
| Total cholesterol            | $< 200$ mg/dL untreated                                                                                                     | 200-240 mg/dL or $< 200$ mg/dL treated                                                                             | $> 240$ mmol/L                                                                                                |
| Blood pressure               | $< 120/80$ mm Hg untreated                                                                                                  | $< 120/80$ mm Hg treated or 120-139/80-89 mm Hg                                                                    | $\geq 140/90$ mm Hg                                                                                           |
| Fasting plasma glucose       | $< 100$ mg/dL untreated                                                                                                     | 100-126 mg/dL or $< 100$ mg/dL treated                                                                             | $> 126$ mg/dL                                                                                                 |

# The neurocognitive benefits of good choices



**A 73 year old male with an optimal health score patient would take on average 12 years to experience a fall of -1.0 in global cognition vs. 6 years for with no optimal risk factors**

# How early does brain decline begin?

JAMA | Preliminary Communication

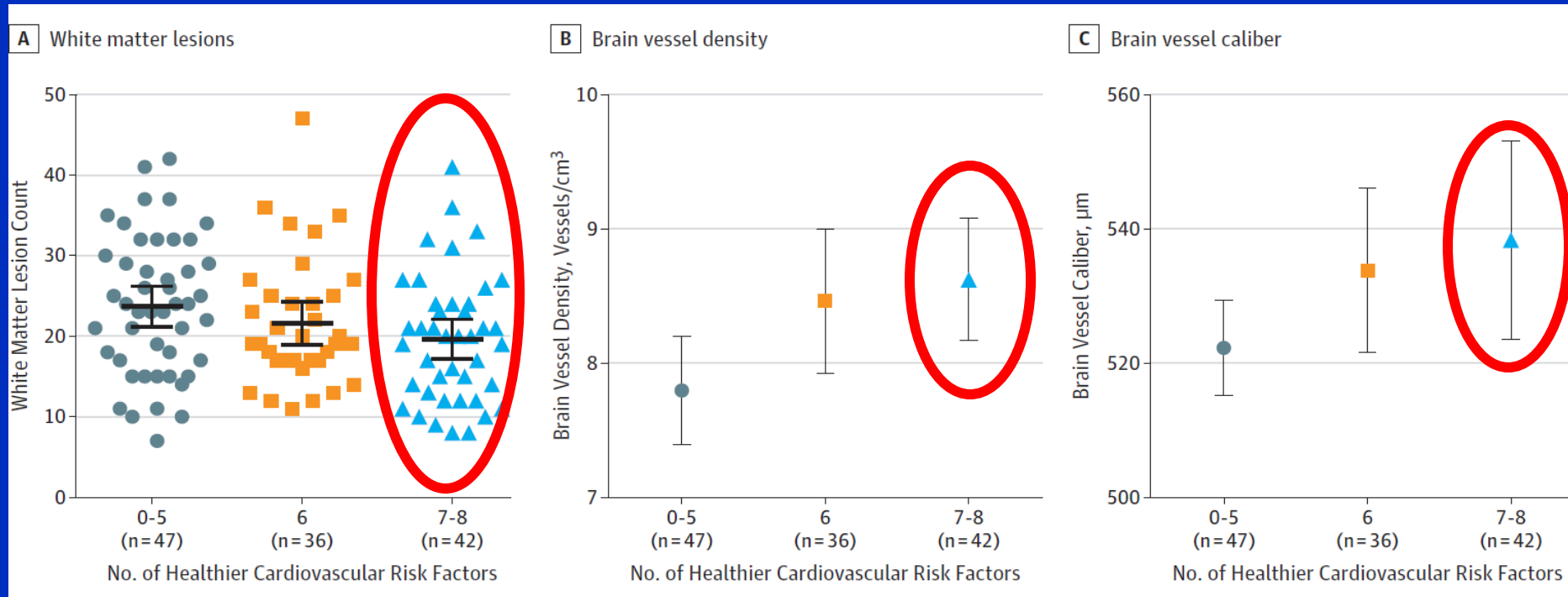
## Association of Cardiovascular Risk Factors With MRI Indices of Cerebrovascular Structure and Function and White Matter Hyperintensities in Young Adults

Wilby Williamson, MSc, MRCP; Adam J. Lewandowski, DPhil; Nils D. Forkert, PhD; Ludovica Griffanti, PhD; Thomas W. Okell, DPhil; Jill Betts, DPhil; Henry Boardman, MRCP, DPhil; Timo Siepmann, MD; David McKean, MD; Odaro Huckstep, MSc; Jane M. Francis, DCR(R); Stefan Neubauer, MD, FRCP; Renzo Phellan, MSc; Mark Jenkinson, DPhil; Aiden Doherty, PhD; Helen Dawes, PhD; Eleni Frangou, MSc (Res); Christina Malamateniou, PhD; Charlie Foster, PhD; Paul Leeson, PhD, FRCP

2018 UK cohort: N=125, average age 25 yrs. 50% women. MRIs to assess vessel density, caliber, and white matter hyperintensity lesions

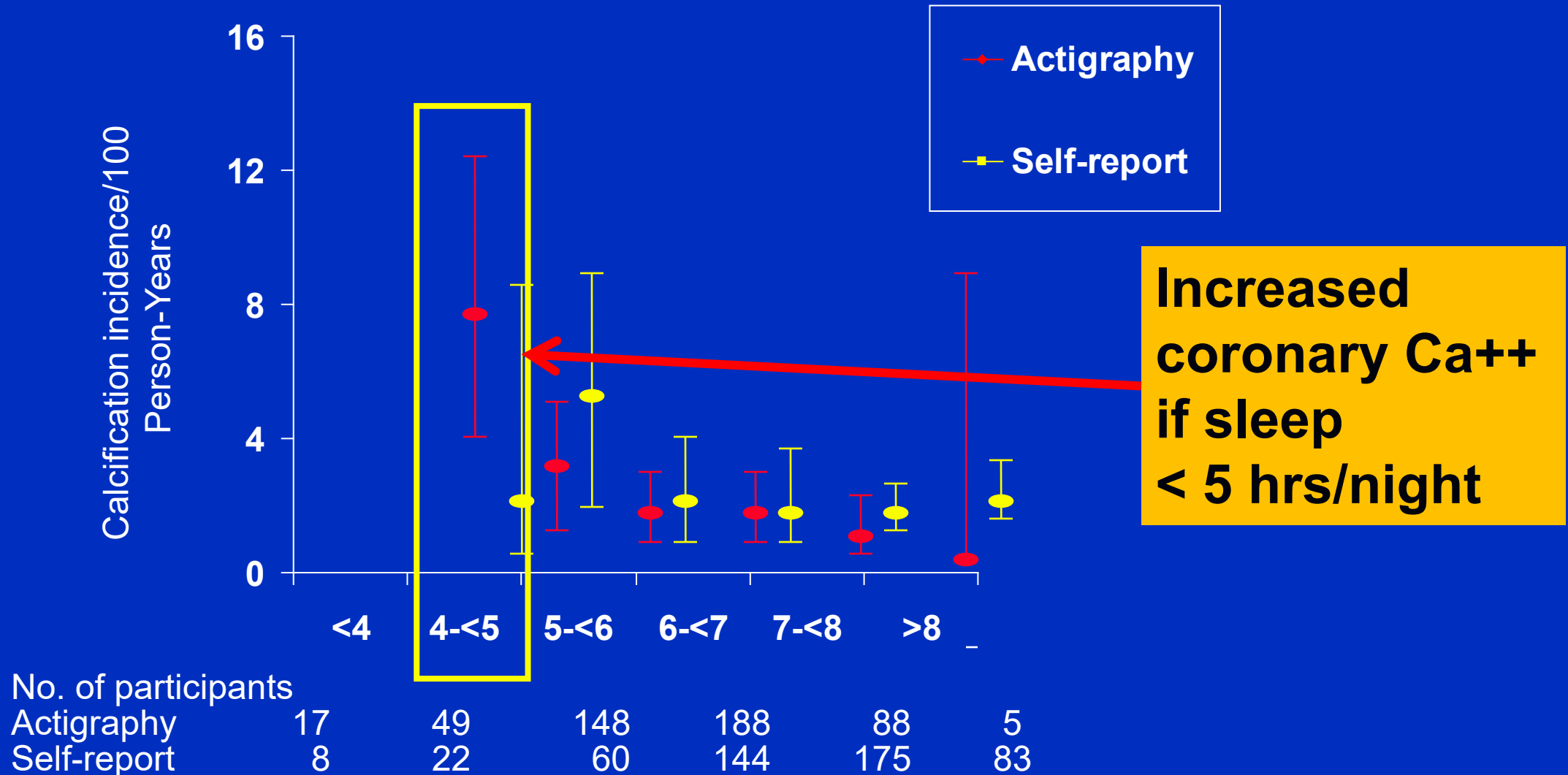
Risk factors: BMI <25, high fitness, alcohol < 8/wk., non smoker > 6 mos., no diastolic HTN with exercise, BP<130/80, Chol<200, FBS< 100

# Early life attention to risk factors associated with better brain health



**Fewer white matter lesions and improved blood vessel health found in those with the best modifiable cardiac risk factors**

# Shortened sleep is associated with increased coronary calcium scores (Coronary artery risk development in young men and women, 20 yrs follow-up ages 35-48)



# Longer work hours associated with CV disease

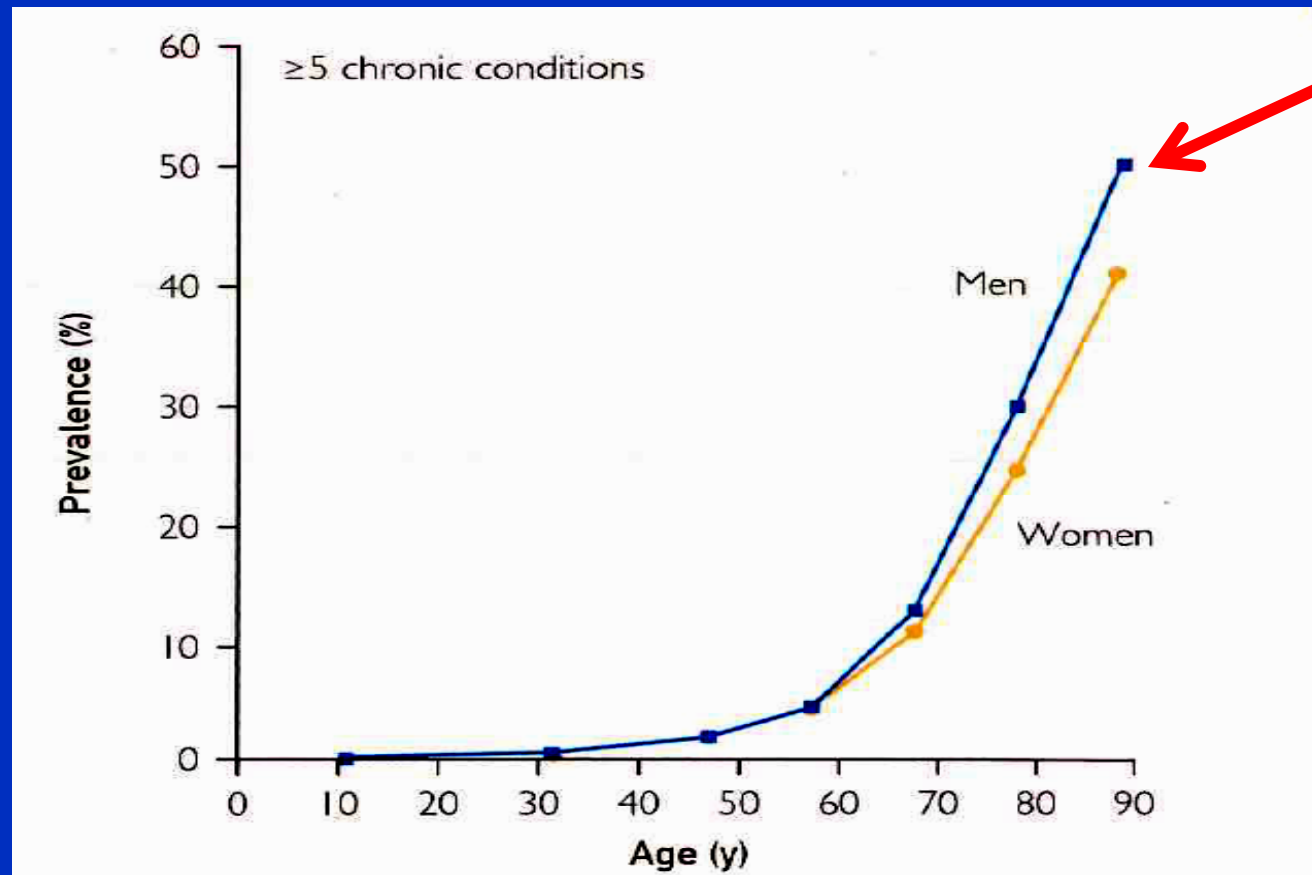
(Cohort study, London civil servants,  
N=7095, men and women, 12 yr follow-up)

| Work hours/d      | CV Risk Ratio           |
|-------------------|-------------------------|
| 7-8               | 1.0                     |
| 9                 | 0.9 (NS)                |
| 10                | 1.45 (NS)               |
| <u>11 or more</u> | <u>1.67 (1.10-2.55)</u> |

**Do you take care of your self?**  
**How do you maintain poise under pressure?**



# The burden of chronic disease is growing as our population ages



**By age 80, 40% of men and women have  $\geq 5$  chronic conditions**

# The world we share as physicians

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We live with increasing levels of “complexity density”

Our roles as teachers (“doctors”), coaches, care managers, and decision makers demand continuous attention and balance

So what do our patients expect of us?

# Your knowledge forms the basis for trust

- Confident
- Empathetic
- Humane
- Personal
- Forthright
- Respectful
- Thorough



# Doctor as Healer

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## Practitioner skills to promote healing relationships:

- Do the little things
- Take time and listen
- Be open
- Find something to like, to love
- Remove barriers
- Let the patient explain
- Share authority
- Be committed and trustworthy

# Doctor as practitioner of “appreciative inquiry”

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## Test yourself:

Ask the patient to teach you what you have taught them, the “teach back”

## Know how your patients live their lives:

Medication usage is a window

- Prescription and nonprescription
- Why does a patient take a medication

# Doctor as teacher:

## What are your “talking points?”

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### The marketing of ideas:

- Stay on message
- Simple themes
- Use your knowledge, the “evidence”

**How good are you at self care:  
Who is your doctor?**

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# John Hopkins physician cohort: “Usual source of care” and likelihood of receiving prevention services, 1948-1997

| Preventive<br>service, % | No MD | Has MD | Adj. OR<br>(95% C.I.) |
|--------------------------|-------|--------|-----------------------|
| FOB                      | 36    | 68     | 0.26(0.18-0.38)       |
| Any colon<br>screening   | 49    | 75     | 0.26(0.18-0.39)       |
| Mammogram                | 47    | 84     | 0.17(0.05-0.62)       |
| PSA                      | 62    | 84     | 0.33(0.22-0.49)       |
| Influenza                | 59    | 78     | 0.48(0.30-0.58)       |

# You have the right to protect the “sanctity” of your cognition

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**Nurses were interrupted for 53% of medications administered with dire consequences**

**For each RN interruption:**

**Procedural failures<sup>+</sup>**

**12.1% higher**

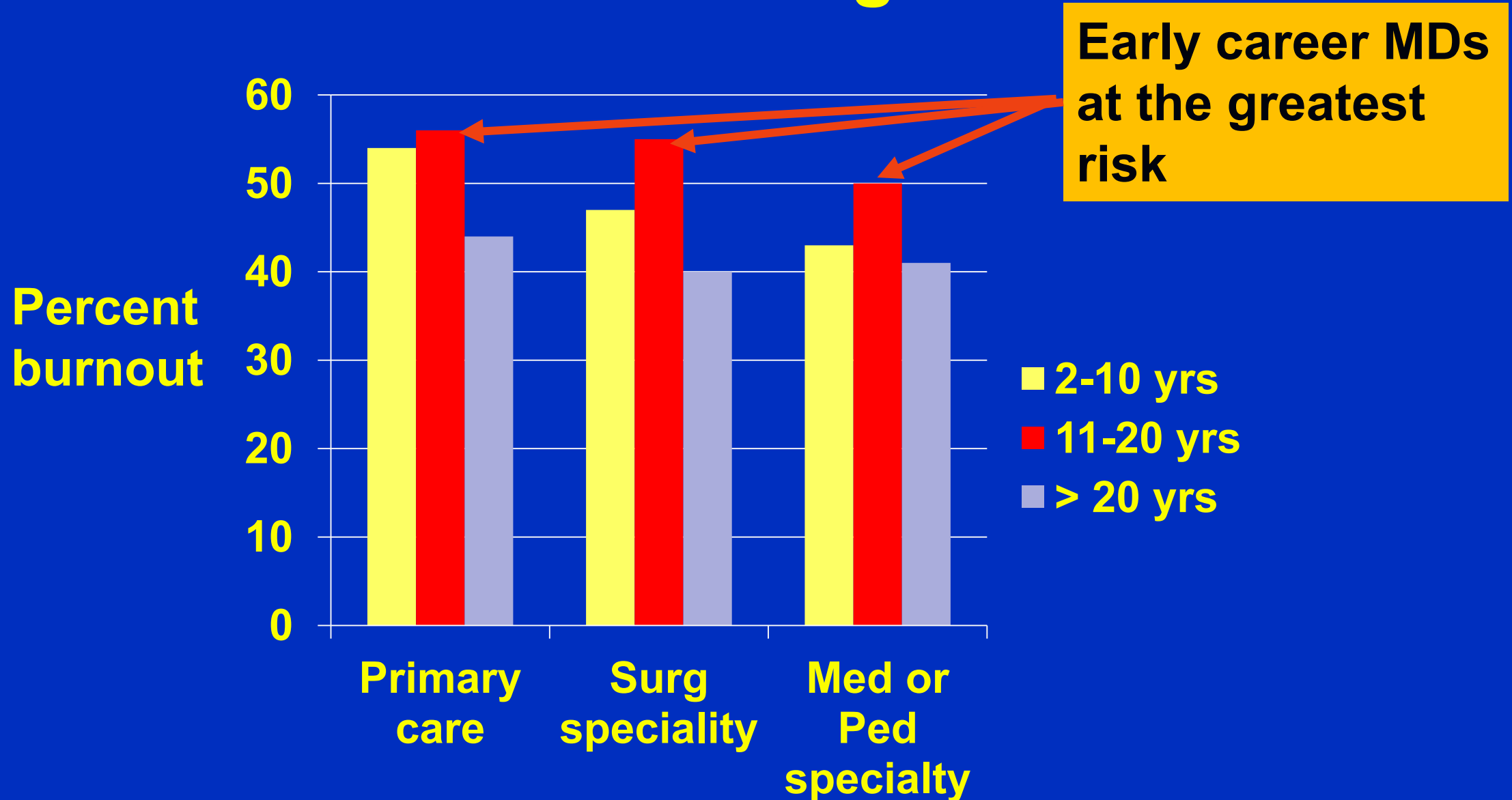
**Clinical errors<sup>++</sup>**

**12.7%**

+ Aseptic technique

++ Wrong dose

# The crisis of colleague burnout



# Our most enduring resource: A purposeful life



Original Investigation | Public Health

## Association Between Life Purpose and Mortality Among US Adults Older Than 50 Years

Aliya Alimujiang, MPH; Ashley Wiensch, MPH; Jonathan Boss, MS; Nancy L. Fleischer, PhD, MPH; Alison M. Mondul, PhD, MPH; Karen McLean, MD, PhD; Bhramar Mukherjee, PhD; Celeste Leigh Pearce, PhD, MPH

**US Health and RUS Health and Retirement Study**

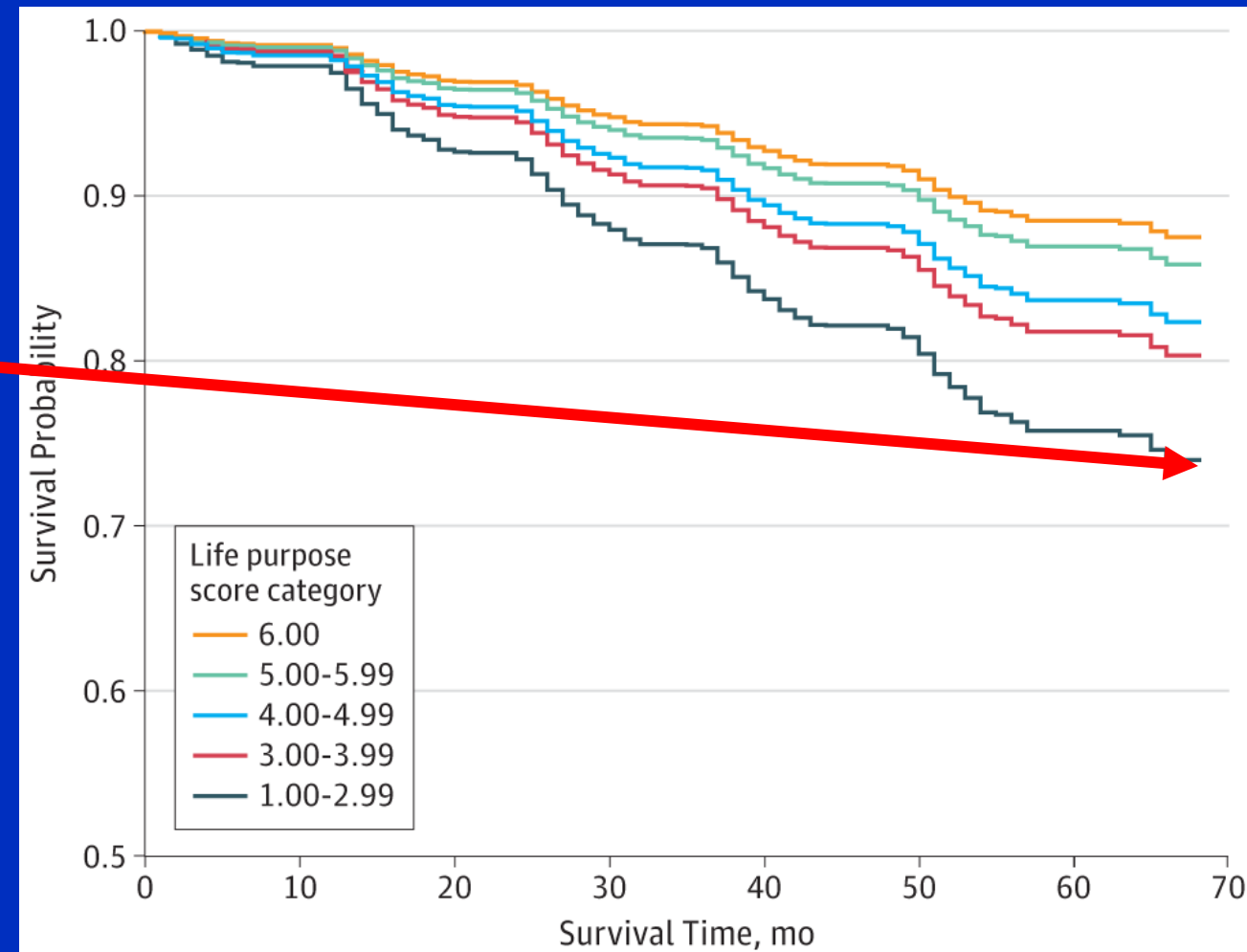
**Cohort study: N = 6985. Born 1931-1941, follow-up 2019 (age range 68-78)**

**2006 interviews: Life purpose (7 items)**

| Scale                    | 1    | 2    | 3    | 4    | 5    | 6    |
|--------------------------|------|------|------|------|------|------|
| 1. Self-Acceptance       | —    | .46  | .40  | .22  | .18  | .22  |
| 2. Environmental Mastery |      | —    | .38  | .13  | .23  | .28  |
| 3. Positive Relations    |      |      | —    | .14  | .16  | .15  |
| 4. Purpose in Life       |      |      |      | —    | .31  | .13  |
| 5. Personal Growth       |      |      |      |      | —    | .20  |
| 6. Autonomy              |      |      |      |      |      | —    |
| $\alpha$                 | .52  | .49  | .56  | .33  | .40  | .37  |
| $M$                      | 14.6 | 14.9 | 14.8 | 14.4 | 15.7 | 15.2 |
| $SD$                     | 3.1  | 2.8  | 3.2  | 3.2  | 2.5  | 2.6  |

*Note.* All correlation coefficients are statistically significant at the .05 level.

**Lowest life purpose score had increased mortality X 2.43**



# Measures of purposefulness

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- **Self-acceptance:** This is the life you have chosen
- **Environment mastery:** This is a challenge
- **Positive relations:** Collaboration works
- **Purpose in life:** This is the gift of our profession
- **Personal Growth:** Learning at every moment
- **Autonomy:** This too is a challenge

# Take care of yourself and each other

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- Exercise and move about
- Eat well
  - Mind your calories
  - Mind your sodium
- Rest soundly
- Balance your life
- Find peacefulness
- Socialize: Talk to your friends and neighbors

# Thank you

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## Questions?

# Useful materials

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1. Vaccines
2. Hearing questions
3. Depression screening
4. Details of endocarditis prophylaxis
5. Herbal therapies
6. Grapefruit juice

# Vaccination recommendations

## Influenza

-Age  $\geq$  6mos

## Pneumococcal (PPSV 23)

- Age over 65, chronic illness, HIV, HbS, asplenia,
- Revaccinate at 5 yrs once only if first vaccine < 65 yrs. PCV 13 if functional asplenia, immunocompromised, CSF leak, cochlear implant.
- 12 months after PCV 13
- > 19, chronic illness (smokers, DM, CHF, CKD, COPD, asthma, etc.)

## PCV 13

- $\geq$  65 if no previous PPSV 23 or at least 12 months after PPSV 23; high risk

# Vaccination recommendations (cont'd)

## Hepatitis B

Health care workers, IVDA, homosexual, dialysis, transfusion dependent patients

## Hepatitis A

Travel to endemic areas, homosexual, IVDA, chronic liver disease, occupational risk

## Varicella

Health care workers; possible household carriers who might contact immunocompromised patient; high risk, non-pregnant child-bearing-aged women; possible international travel, ? duration

# Vaccination recommendations (cont'd)

**Pertussis Tdap®** -Pregnant women during pregnancy  
-Health care workers and child care providers  
-1 dose every 10 yrs.

**HPV (Gardasi®)** -Boys/Girls, Men/Women age 11-26, possibly to age 45; 0, 2, 6 mos.

**Shingles (Shingrex®)** -Age  $\geq 50$ ; Two doses, initial and second 2-6 mos.

# Vaccination recommendations (cont'd)

## **Polio**

- Foreign travel to endemic areas, enhanced potency inactivated preferred

## **Meningococcal**

- Travel to endemic area, asplenia

## **Measles**

- Adults born after 1956 without documented measles, or serologic evidence of immunization after 1 year of age. Since 1989, children have received 15 month and school age vaccination.

## **Tetanus and diphtheria**

- Primary series (0, 4 mos, 6-12 months) if no previous vaccination.
- Booster age 50, every 10 years.

# Questions from hearing handicap inventory for the elderly-screening version (HHIE-S)\*

Yes = 4pts, sometimes = 2 pts, no = 0 points

1. Does a hearing problem cause you to feel embarrassed when meeting new people?
2. Does a hearing problem cause you to feel frustrated when talking to members of your family?
3. Do you have difficulty hearing when someone speaks in a whisper?
4. Do you feel handicapped by a hearing problem?
5. Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors?

# Questions from hearing handicap inventory for the elderly-screening version (HHIE-S)\*

6. Does a hearing problem cause you to attend religious services less often than you would like?
7. Does a hearing problem cause you to have arguments with family members?
8. Does a hearing problem cause you difficulty when listening to TV or radio?
9. Do you feel that any difficulty with your hearing limits or hampers your personal or social life?
10. Does a hearing problem cause you difficulty when a restaurant with relatives or friends?

# Depression

Diagnostic criteria (DSM-IV):

A major depressive episode is diagnosed if *five or more symptoms are present for at least two weeks.* One of the symptoms must be depressed mood or loss of interest.

- **Depressed mood**
- Markedly **diminished interest or pleasure** in almost all activities
- Significant (> 5% body weight) **weight loss or gain**, or decrease in appetite
- **Insomnia or hypersomnia**
- **Fatigue or loss of energy**
- Feeling of **worthlessness or inappropriate guilt**
- **Diminished concentration or indecisiveness**
- Current thoughts of **death or suicide**

## Dental procedures for which endocarditis Prophylaxis is reasonable for patients in Table

- All dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa\*
- The following procedures and events do not need prophylaxis: routine anesthetic injections through noninfected tissue, taking dental radiographs, placement of removable prosthodontic or orthodontic appliances, adjustment of orthodontic appliances, placement of orthodontic brackets, shedding of deciduous teeth, and bleeding from trauma to the lips or oral mucosa.

# Summary of Major Changes (cont'd)

Antibiotic prophylaxis is reasonable for procedures on respiratory tract or infected skin, skin structures, or musculoskeletal tissue only for patients with underlying cardiac conditions associated with the highest risk of adverse outcome from IE

# Summary of Major Changes (cont'd)

**Antibiotic prophylaxis solely to prevent IE is not recommended for GU or GI tract procedures.**

Although these guidelines recommend changes in indications for IE prophylaxis with regard to selected dental procedures, the writing group reaffirms that those medical procedures listed as not requiring IE prophylaxis in the 1997 statement remain unchanged and extends this view to vaginal delivery, hysterectomy, and tattooing.

# Summary of Major Changes (cont'd)

Additionally, the Committee advises against body piercing because of the possibility of bacteremia, while recognizing that there are minimal published data regarding the risk of bacteremia or endocarditis associated with body piercing.

# **Cardiac conditions associated with the highest risk of adverse outcome from endocarditis for which prophylaxis with dental procedures is reasonable**

Prosthetic cardiac valve or prosthetic material used for cardiac valve repair.

Previous IE

Congenital heart disease (CHD)\*

Unrepaired cyanotic CHD, including palliative shunts and conduits

Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first 6 months after the procedure†

## **Cardiac conditions associated with the highest risk of adverse outcome from endocarditis (cont'd)**

Repaired CHD with residual effects at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialization)

Cardiac transplantation recipients who develop cardiac valvulopathy

\*Except for the conditions listed above, antibiotic prophylaxis is no longer recommended for any other form of CHD.

†Prophylaxis is reasonable because endothelialization of prosthetic material occurs within 6 months after the procedure.

# Summary of Major Changes (cont'd)

Antibiotic prophylaxis is no longer recommended for any other form of CHD, except for the conditions listed in Table.

# Regimens for a Dental Procedure

**Regimen: Single Dose 30 to 60 min before procedure**

| <b>Situation</b>                                                                  | <b>Agent</b>                   | <b>Adults</b> |
|-----------------------------------------------------------------------------------|--------------------------------|---------------|
| Oral<br>unable to take oral<br>medication                                         | Amoxicillin                    | 2g            |
|                                                                                   | Ampicillin<br>or               | 2 g IM or IV  |
|                                                                                   | Cefazolin or ceftriaxone       | 1 g IM or IV  |
| Allergic to penicillins<br>or ampicillin – oral                                   | Cephalexin                     | 2g            |
|                                                                                   | or                             |               |
|                                                                                   | Clindamycin                    | 600 mg        |
|                                                                                   | or                             |               |
| Allergic to penicillins<br>or ampicillin and unable<br>to take oral<br>medication | Azithromycin or clarithromycin | 500 mg        |
|                                                                                   | Cefazolin or ceftriaxone       | 1 g IM or IV  |
|                                                                                   | or<br>Clindamycin              |               |

# Patients at potential increased risk of experiencing hematogenous total joint infection

| Patient type                                    | Condition placing patient at risk                                                                                                                                                    |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All patients during following joint replacement | N/A                                                                                                                                                                                  |
| Immunocompromised/immuno-suppressed patients    | <b>Inflammatory arthropathies such as rheumatoid arthritis, systemic lupus erythematosus</b><br><br><b>Drug-or radiation-induced Immuno-suppressions</b>                             |
| Patients with comorbidities                     | <b>Previous prosthetic joint infections</b><br><b>Malnourishment</b><br><b>Hemophilia</b><br><b>HIV infection</b><br><b>Insulin-dependent (Type 1) diabetes</b><br><b>Malignancy</b> |

# Medications where bioactivity may be significantly enhanced by grapefruit juice

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Amiodarone

Cyclosporine

Triazolam

Midazolam

Sertraline

Fluoxetine

Buspirone

Carbamazepine

Scopolamine

Methadone

Dextromethorphan

Simvastatin

Lovastatin

Pravastatin

Nifedipine

Felodipine

Amlodipine

Nisoldipine

Verapamil

Losartan

Saquinavir

Erythromycin

Estradiol

Sildenafil

Cilostazol

Fexofenadine

Warfarin

Quinidine

Digoxin

# Herbal therapies: Indications

| Herb            | Condition        | Conclusion and Comments                                                                         |
|-----------------|------------------|-------------------------------------------------------------------------------------------------|
| Ginkgo leaf     | Dementia         | RCTs suggest superiority to placebo, effect size is limited and of uncertain clinical relevance |
| Hawthorn        | Heart failure    | Improvements in cardiac performance                                                             |
| Saw palmetto    | Benign prostatic | RCTs suggest improvement in urinary symptoms                                                    |
| St. John's wort | Depressive       | RCTs suggest superiority to placebo, mild to moderately severe                                  |

# Herbal therapies: Indications (cont'd)

| Herb          | Condition               | Conclusion and Comments                                |
|---------------|-------------------------|--------------------------------------------------------|
| Ginseng root  | Various indications     | Efficacy is unclear for each indication                |
| Echinacea     | Common cold             | Both positive and negative findings have been reported |
| Primrose oil  | Premenstrual syndrome   | Failed to show a benefit                               |
| Feverfew leaf | Prevention of migraines | RCT's favor feverfew over placebo                      |

# Herbal therapies: Indications (cont'd)

| Herb               | Condition            | Conclusion and Comments              |
|--------------------|----------------------|--------------------------------------|
| Garlic bulb        | Hypercholesterolemia | Possible small, short-term benefits  |
| Ginger root        | Nausea and vomiting  | Possible effect                      |
| Kava               | Anxiety              | RCT's suggest superiority to placebo |
| Milk-thistle fruit | Liver diseases       | Inconclusive                         |
| Valerian root      | Insomnia             | Inconclusive                         |