

center for
Women's Health
RESEARCH



Finding Answers. Saving Lives

University of Colorado at Denver and Health Sciences Center

Cardiovascular Disease in Women: Challenges in 2009

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Women and CVD: Understanding the Significance

- **Cardiovascular disease (CVD) is the leading cause of death in women**
- **More than 500,000 women die each year of cardiovascular disease, more than the next 7 causes of death combined.**
- **In the USA, one woman dies of cardiovascular disease every minute**
- **> 3 million hospitalizations/year for CVD**

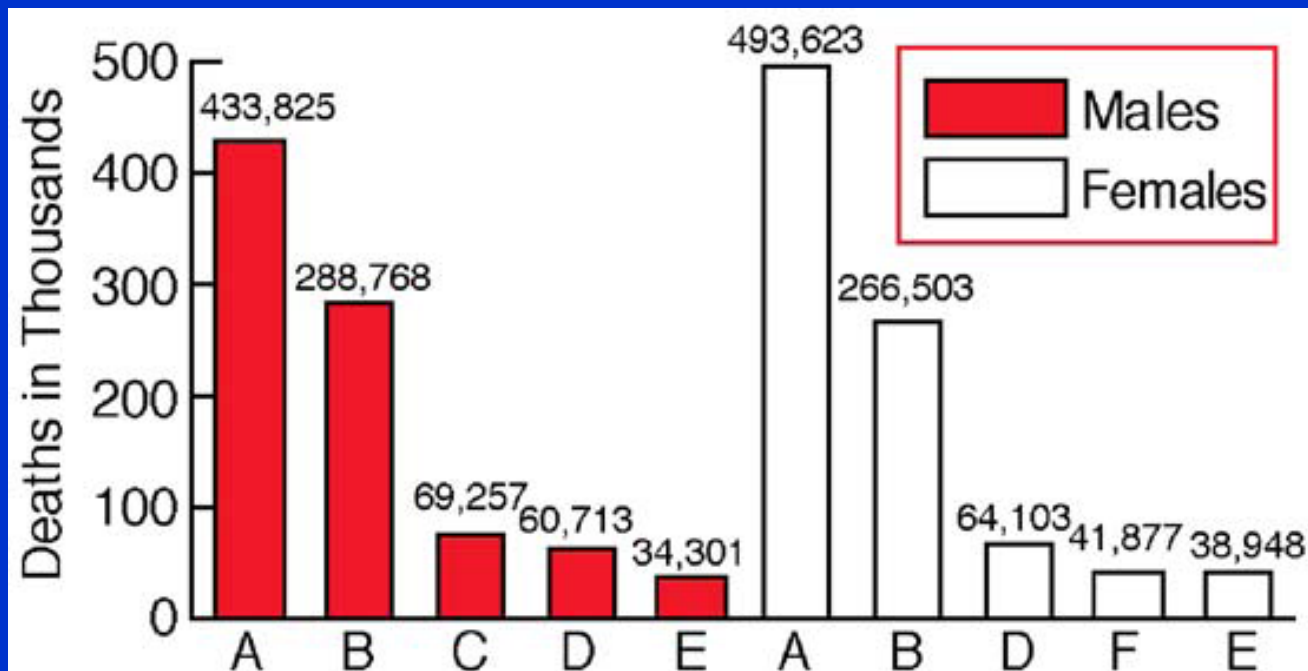
Outline

- Defining the issues
- **Understanding the Challenges**
 - **Coronary artery disease, Stroke, Peripheral artery disease**
- Approaches to managing the challenges

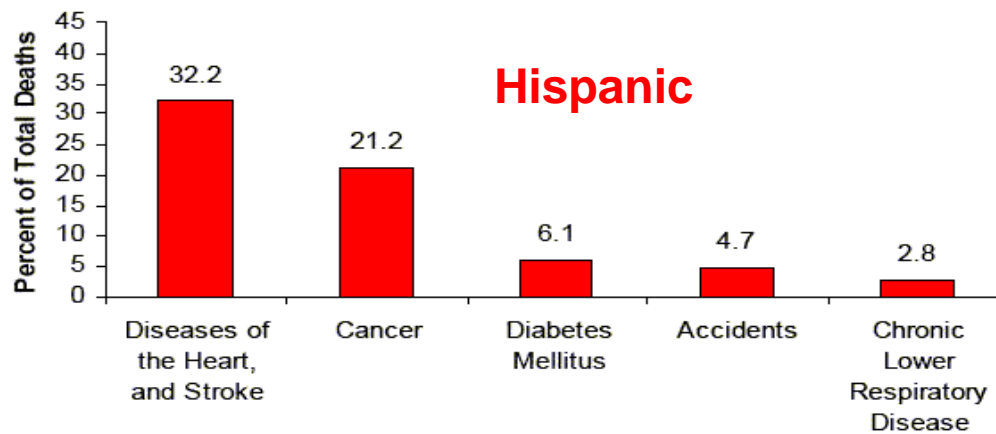
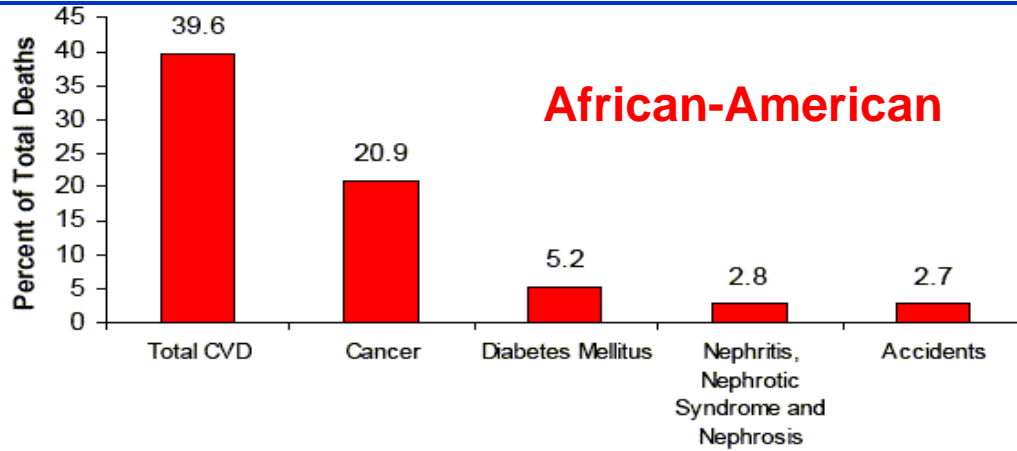
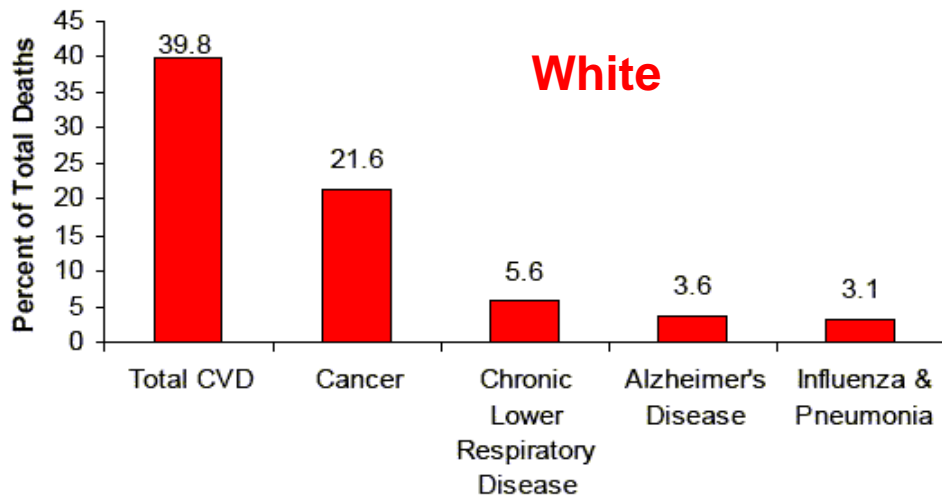
Atherothrombotic Diseases in the US

	Prevalence (millions)	Incidence (millions)
CAD	13.2	1.2
CVD	4.8	0.7
PAD	8.0	—

Leading causes of death for all males and females

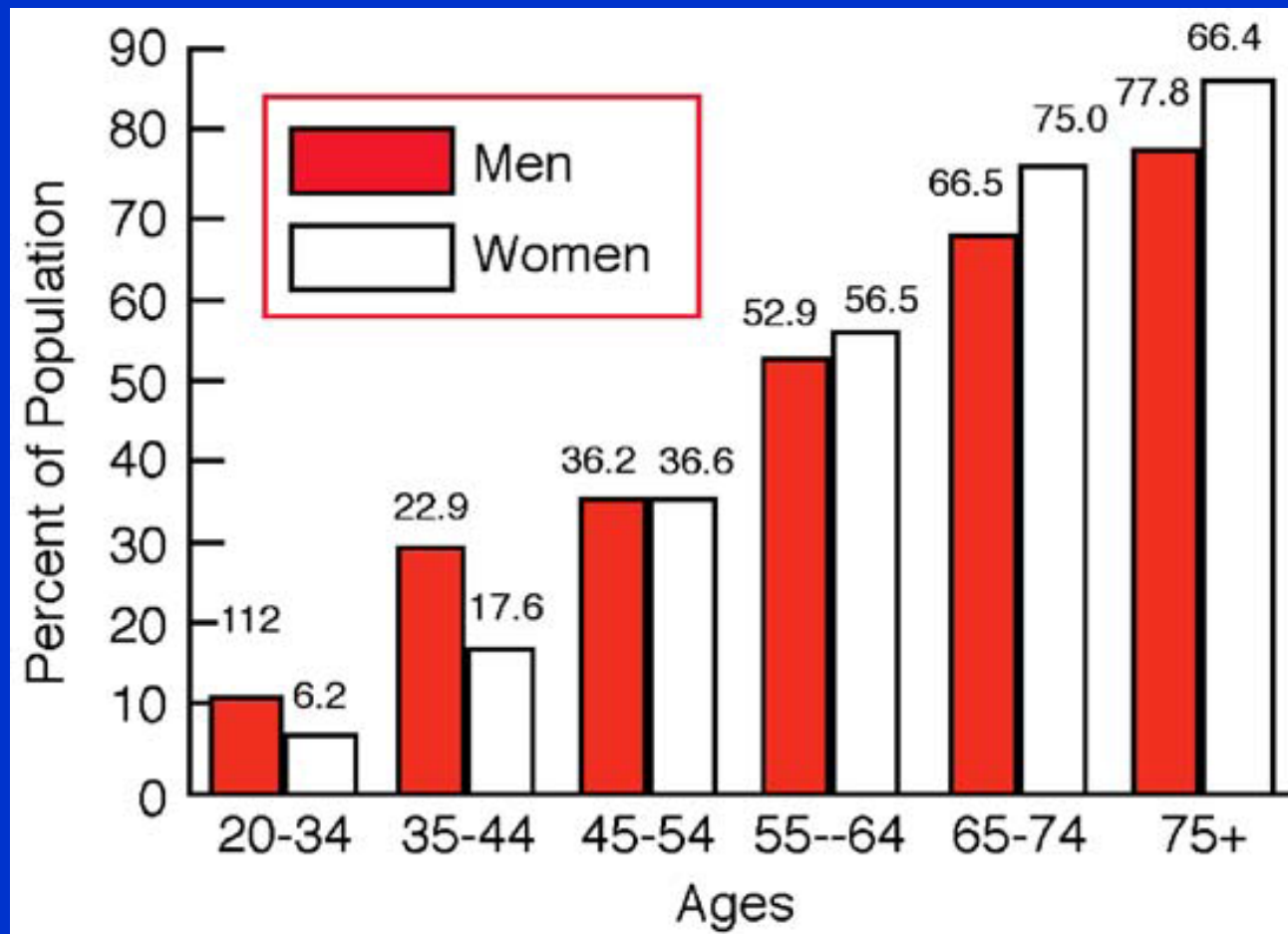


A. Total CVD, B: Cancer, C: Accidents, D: Chronic lower respiratory diseases, E: Diabetes F: Alzheimer's disease



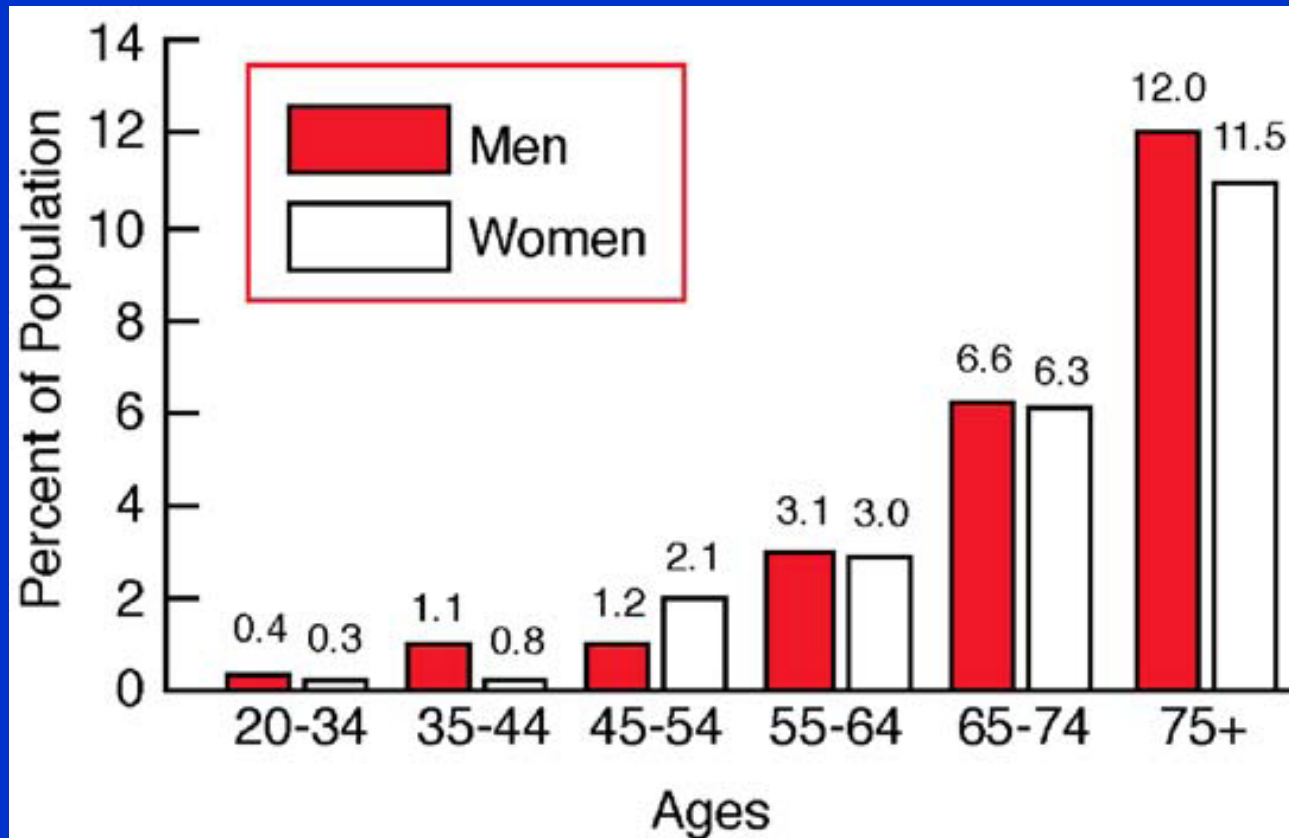
Causes of Death in US women

Prevalence of cardiovascular diseases in Americans age 20 and older by age and sex



Age is a factor but issues are not only true for older people

Prevalence of stroke by age and sex



NHANES:
1999-2002

Women and Cardiovascular Disease: the challenges

- **Only 8% of women identify cardiovascular disease as their greatest health threat**
 - **Nearly 50% don't recognize they are at risk at all**
 - **As many as 30-40% of heart attack patients (and 2/3 of physicians) don't recognize symptoms**
- **Lower referral rate for diagnostic and revascularization procedures**
- **Less referral to cardiologists and more likely to have symptoms ascribed to psychiatric causes**
- **Although overall there is reduction in CV death, not true in women with diabetes**

Recently:

- **New government data show that heart disease death rates dropped 25.8% between 1999 and 2005, from 195 to 144 deaths for every 100,000 people, surpassing the AHA's 25% target goal for reduction. Stroke deaths dropped 24.4%, from 61 to 47 deaths per 100,000**

» American Heart Association, January 2008

However:

- **Women with type 2 diabetes and heart disease have poorer control of both diseases and receive less intensive medical treatment than do men, which may help explain why death due to heart disease has decreased among men but not women with type 2 diabetes**

Gouni-Berthold June 2008

Risk Factors for CVD

- **Non-modifiable**

Age

Family History

Diabetes

(+/-
modifiable)

- **Modifiable**

Smoking

Cholesterol

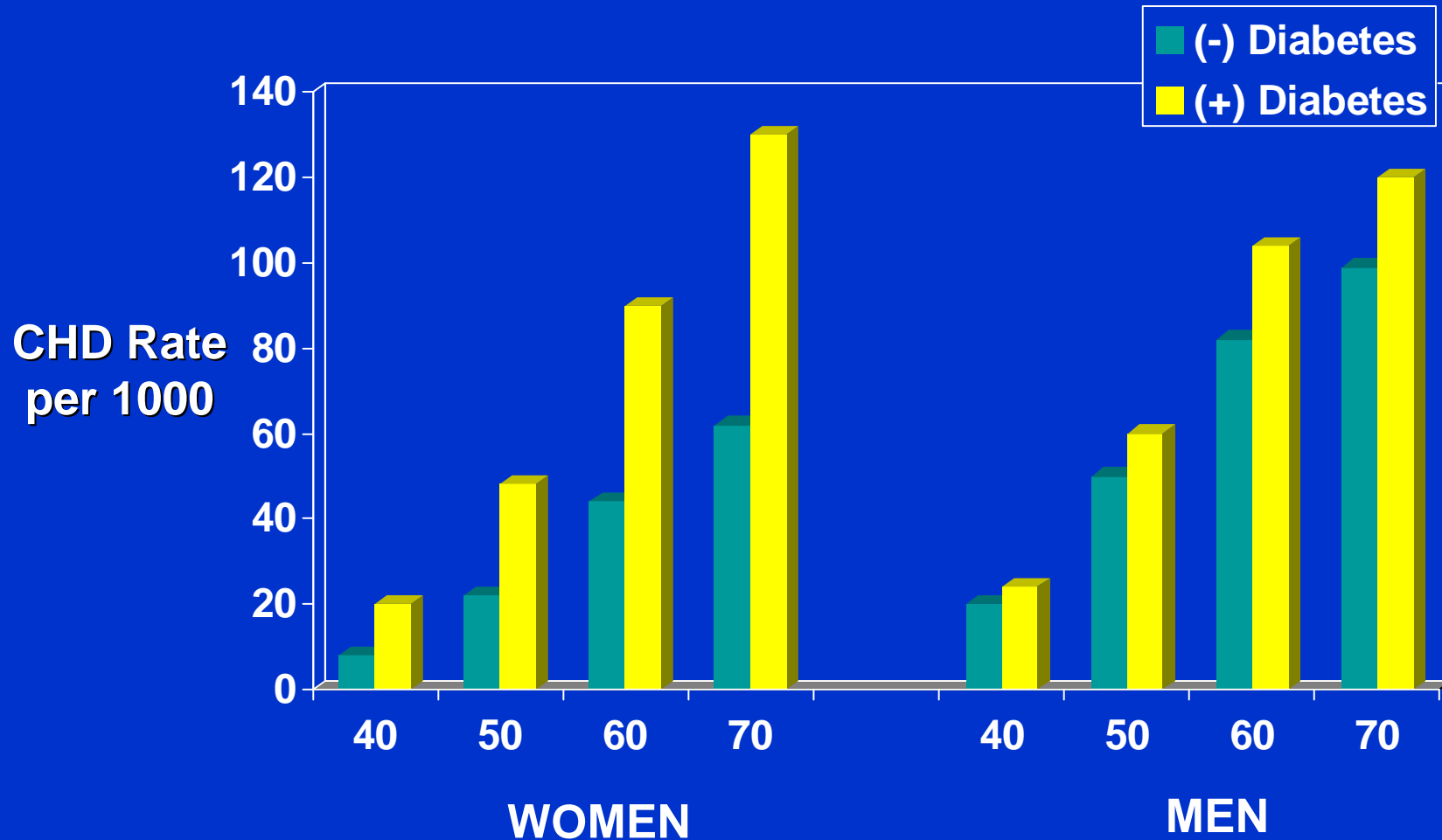
Hypertension

Physical Inactivity

Obesity

Diet

CAD Incidence by Age and Diabetes



Heart Disease Prevention in Women: Inactivity

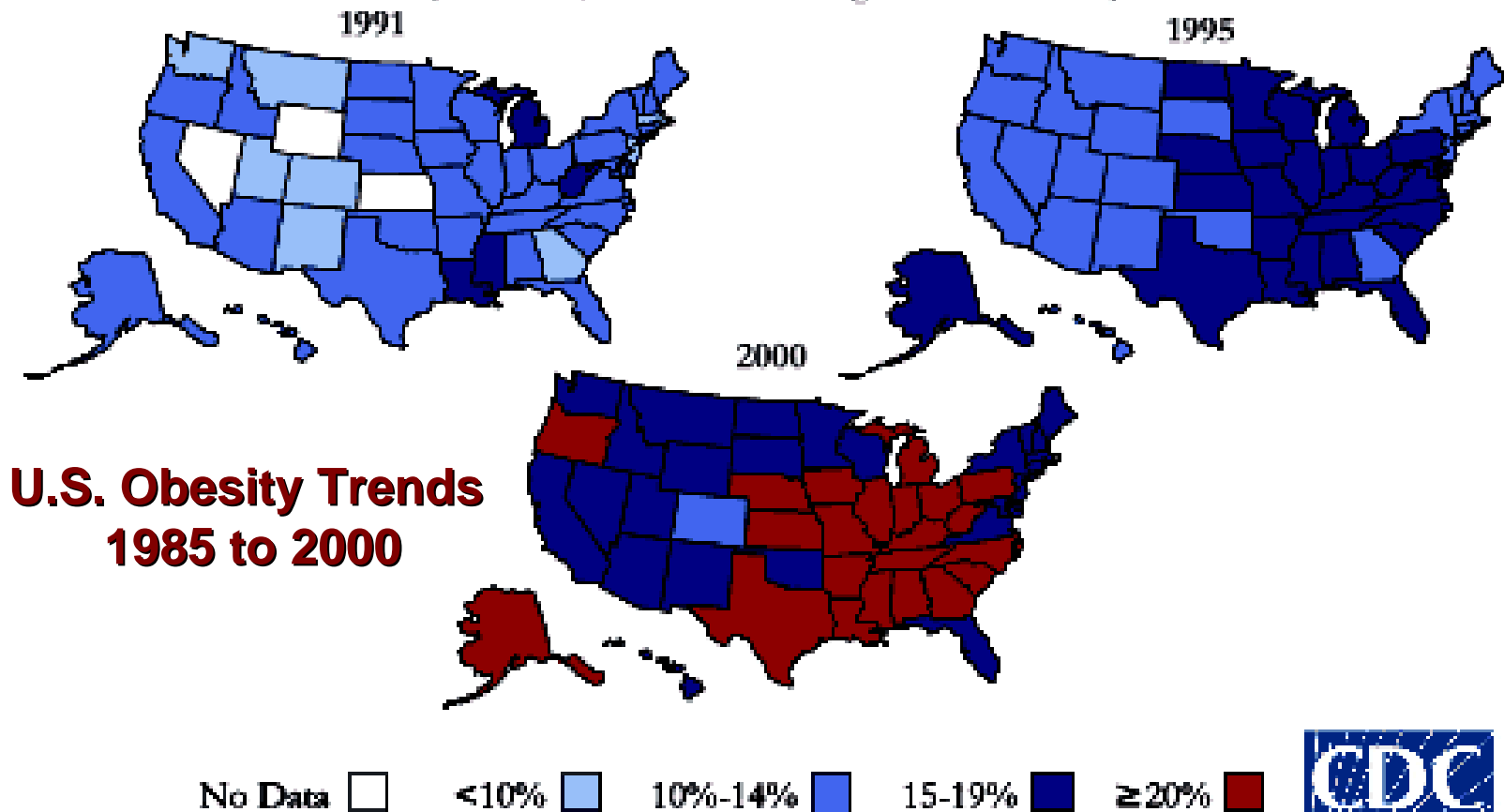
- Among women age >18 years
 - 39% of whites
 - 57% of blacks
 - 57% of Hispanics are sedentary (have no leisure time physical activity)

Obesity in Women

Obesity Trends* Among U.S. Adults

BRFSS, 1991, 1995 and 2000

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5'4" woman)



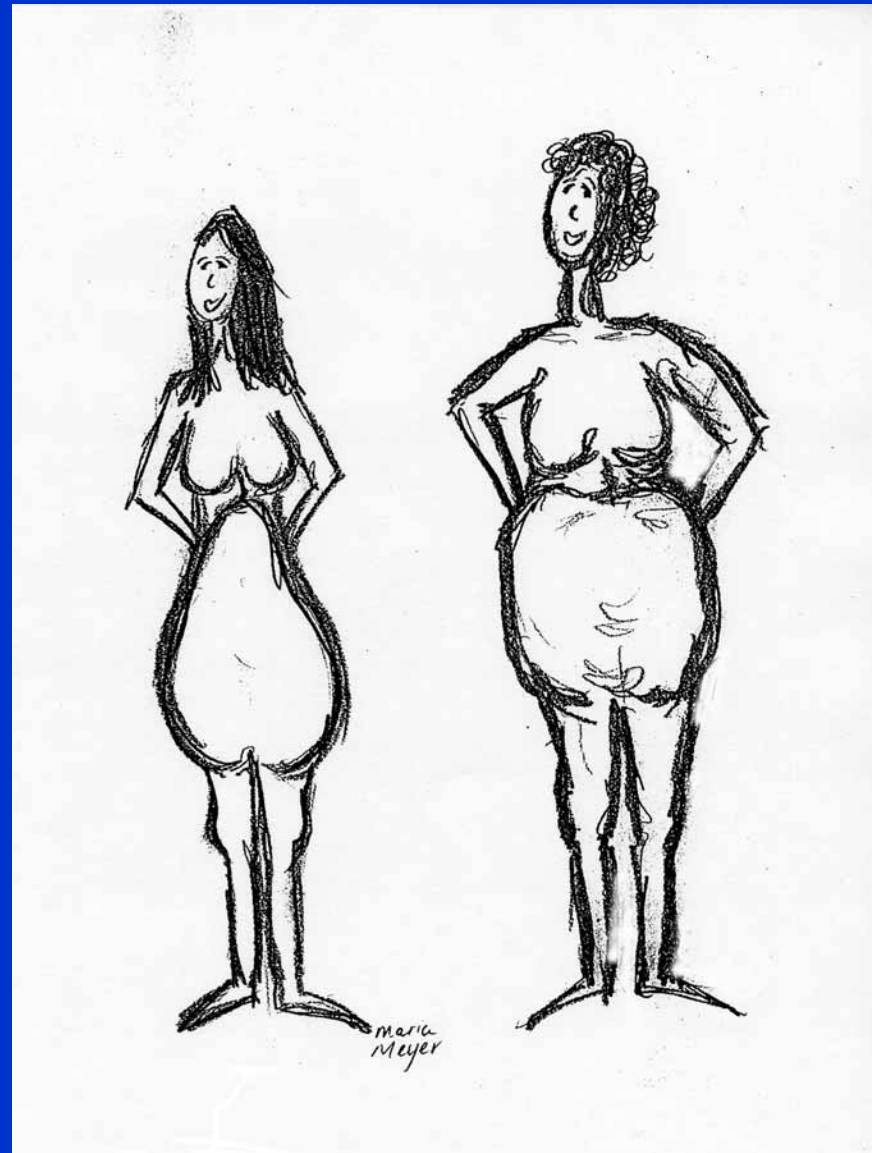
Source: Mokdad A H, et al. *J Am Med Assoc* 1999;282:16, 2001;286:10.



**My doctor told
me to stop
having intimate
dinners for four
unless there
were three other
people.**

**Orson Welles
(1915-1985)**

The Pear



The Apple



Waist Circumference < 35 inches

Recommendations: Lifestyle Interventions

Behavioral changes are the key; prevention is essential:

Physical Activity

30 min mod intensity/5 days a wk.
New government guidelines being published which specifically address issues of women as well as men in terms of exercise)

Heart Healthy Diet

Fruits, vegetables, grains, low or nonfat dairy products,
limit saturated fat & trans fat

Weight Maintenance / Reduction

BMI 18.5-24.9 kg/m²
waist <35in.

Recommendations

- **Treatment of risk factors for CVD in women to guidelines:**
 - Smoking cessation
 - Cholesterol control
 - Hypertension control
 - Diabetes (tight glycemic control)

CVD Challenges for Women: What about another major type of CV disease?

- **Peripheral arterial disease in women**
 - **Prevalence of PAD high in women**
 - **Symptoms of PAD may differ between sexes**
 - **Women under-represented in clinical trials**
 - **Appropriate treatments may differ between men and women**

Atherothrombotic Diseases in the US

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Challenge of PAD: Identification

- Easy to screen for, but often ignored , especially in women.
- Treatments for PAD are underused in women

- McDermott:
- Hirsch- 2002

Ankle-Brachial Index (ABI)

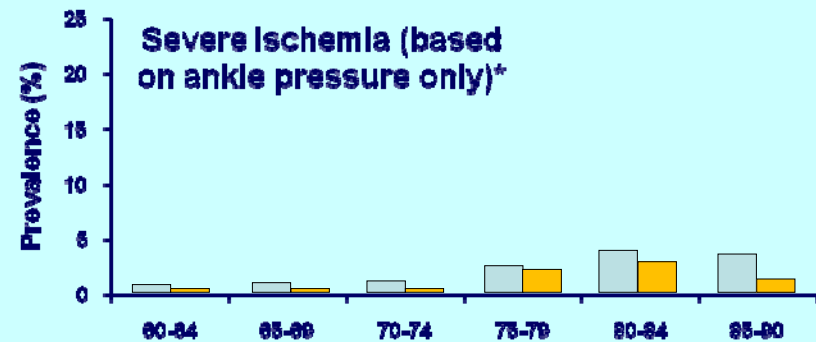
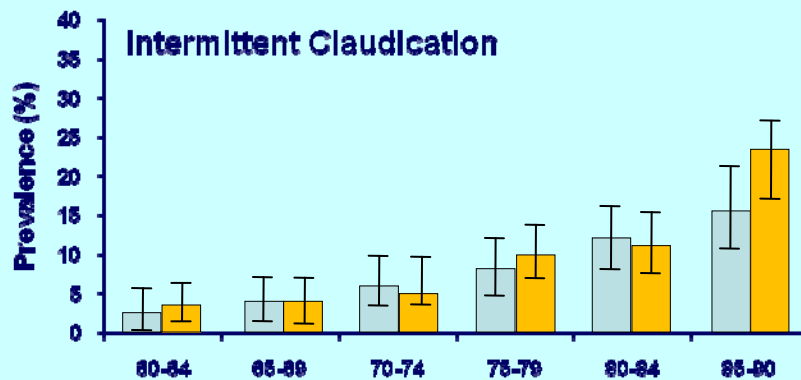
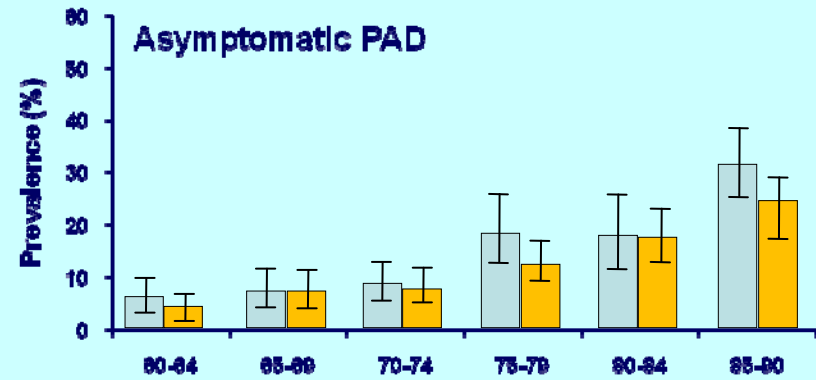
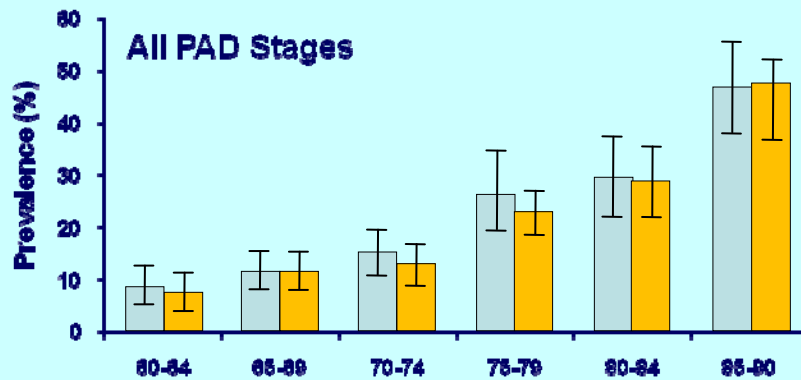


PAD Prevalence: Women vs. Men

I

Prevalence of PAD specific to age and sex presented with 95% CIs

■ Women ■ Men



Sigvant B, et al. *J Vasc Surg.* 2007;45:1185-1191.

CI is not displayed because of small cohorts

PAD is linked to Heart Disease and Stroke: How can we lower the risks?

- **Smoking Cessation**
- **Diabetes**
- **Lower Blood pressure**
- **Lower Cholesterol**
- **Inactivity**
- **Take antiplatelet agent**
- **(Age)**



**Give it to me straight, Doc.
How long do I have to ignore your advice?**

Sex Differences in PAD: Leg symptoms and physical functioning (McDermott et al, 2003)

Characteristics of Women and Men Aged 55 and Older with PAD
(McDermott 2003)

Characteristic	Men N= 273	Women n = 187	P-Value
Age, mean \pm SD	71.2 \pm 8.4	72.9 \pm 8.4	.036
Ankle brachial index, mean \pm SD	0.66 \pm 0.14	0.64 \pm 0.15	.147
Leg symptoms, %			
No exertional leg pain	22.0	16.6	<.001
Leg strength, mean \pm SD			
Hip flexion	65.6 \pm 20.1	41.2 \pm 15.3	<.0001
Hip extension	72.5 \pm 37.0	46.3 \pm 22.7	<.0001
Knee flexion	36.9 \pm 17.0	21.1 \pm 12.0	<.0001

Sex differences in men and women with PAD: WIQ

(Collins et al, 2006)

Women and Men with PAD only	Women N = 33	Men N = 34	
<i>P</i> Value			
WIQ subscale, mean (\pm SD):			
Walking distance	N = 32 29.7 (34.7)	N = 32 56.8 (41.8)	.006
Walking speed	N = 32 30.4 (33.6)	N = 33 50.2 (39.5)	.03
Stair climbing	N = 33 33.5 (34.7)	N = 33 47.1 (42.6)	.16

Treatments for Claudication

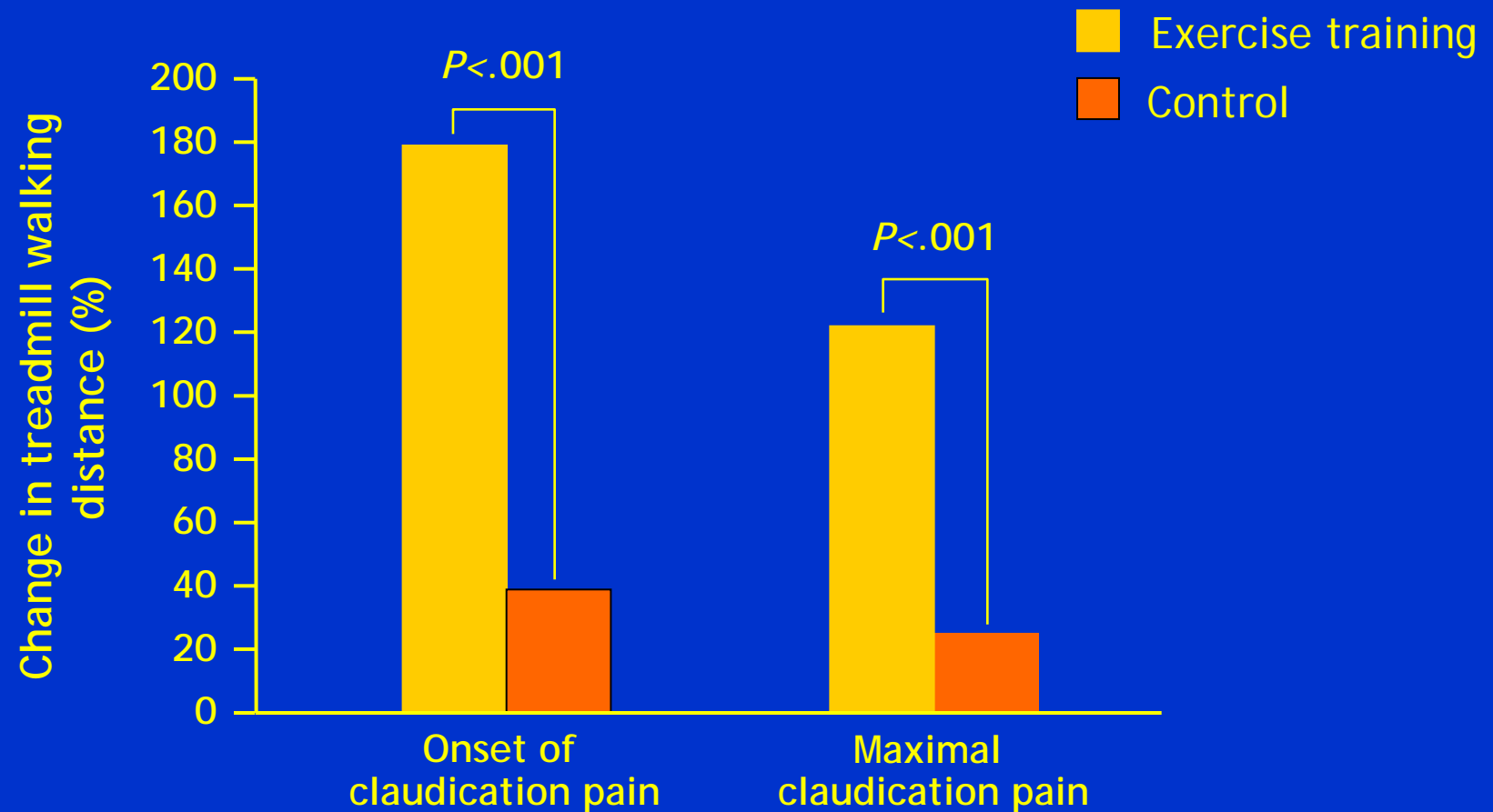
- **Interventional**
 - Bypass surgery and Angioplasty
- **Pharmacologic**
 - Cilostazol
 - Numerous Agents in Development
- **Exercise Rehabilitation**

Treatments for Claudication: Exercise Rehabilitation

- Exercise rehabilitation: Little data about differences in outcomes between genders
- Women and men both appear to show significant benefit.

Effects of Exercise Training on Claudication

Meta-analysis of 21 Studies



Do women benefit from exercise rehabilitation? (Serracino-Inglott 2007)

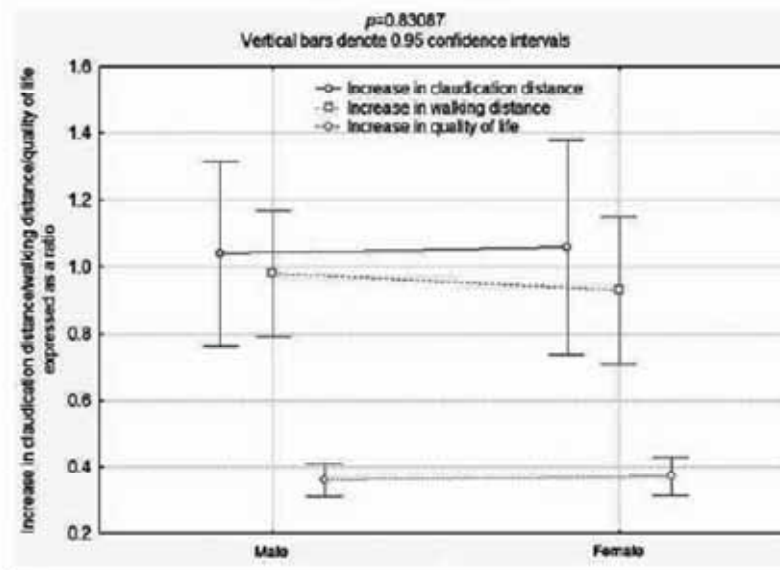
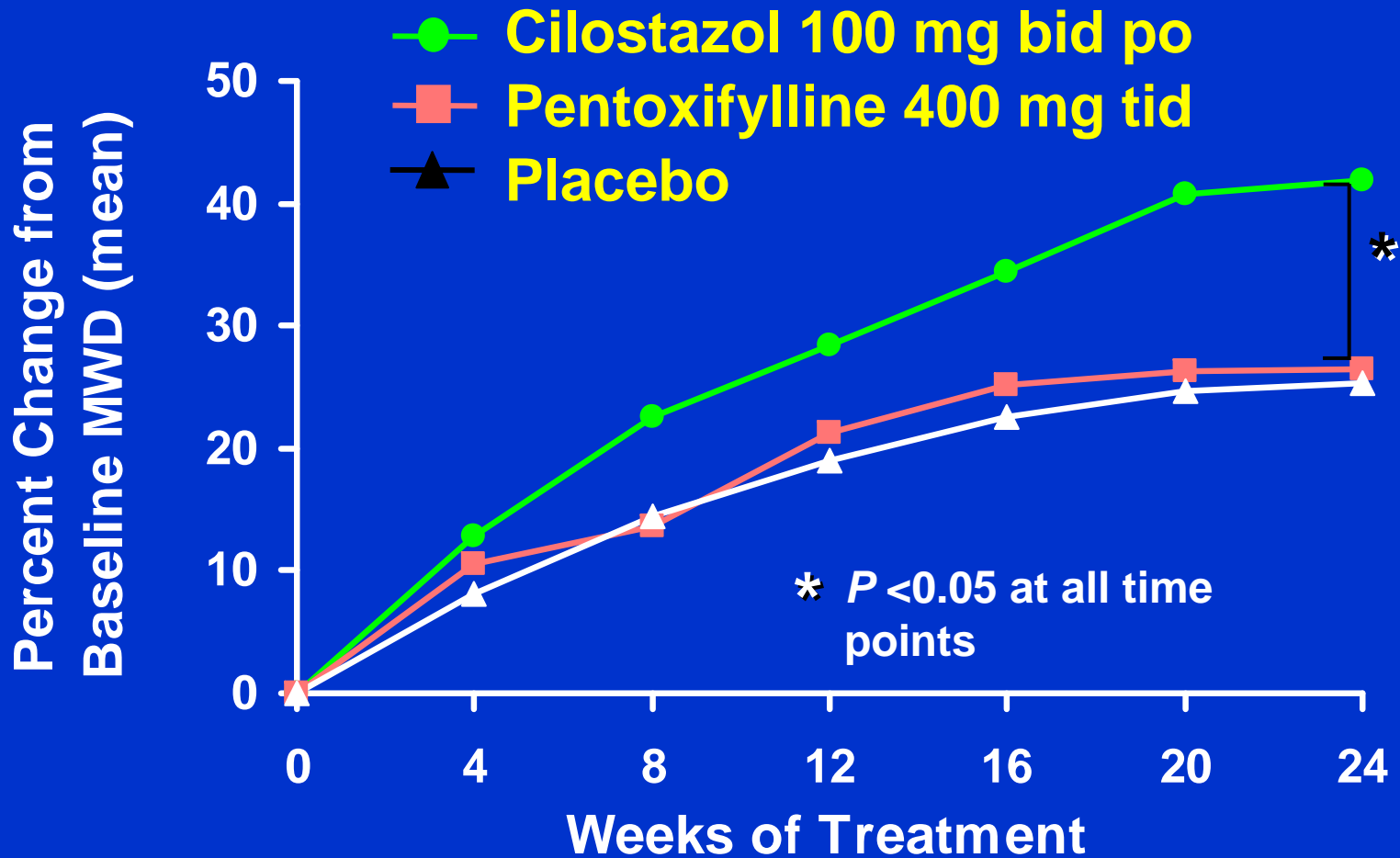
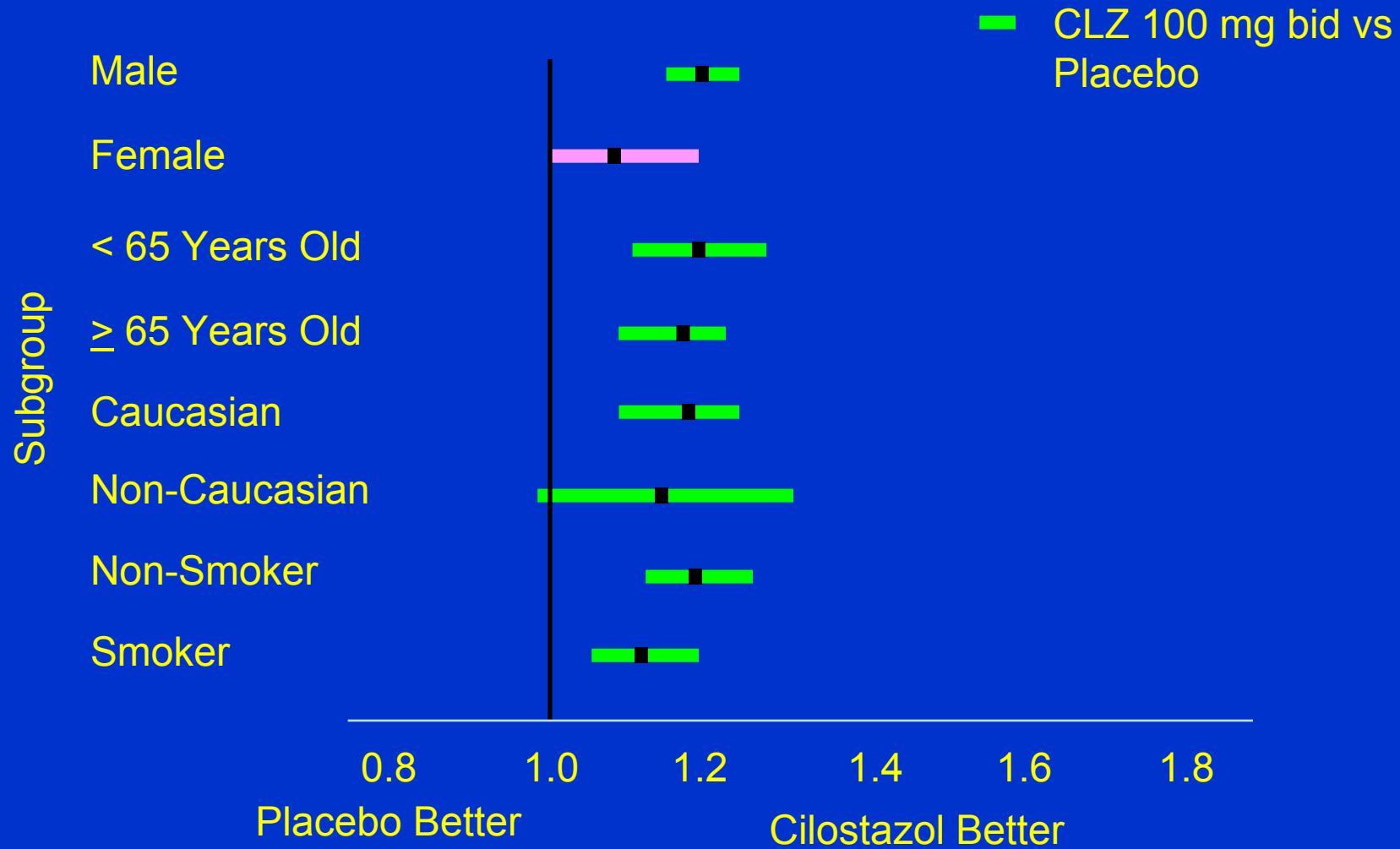


Figure 1. The effect of sex on the results obtained from a supervised exercise program ($P = .830$; vertical bars are 95% confidence intervals.)

Effect of Cilostazol vs. Pentoxifylline on Walking Distance in Patients with Claudication



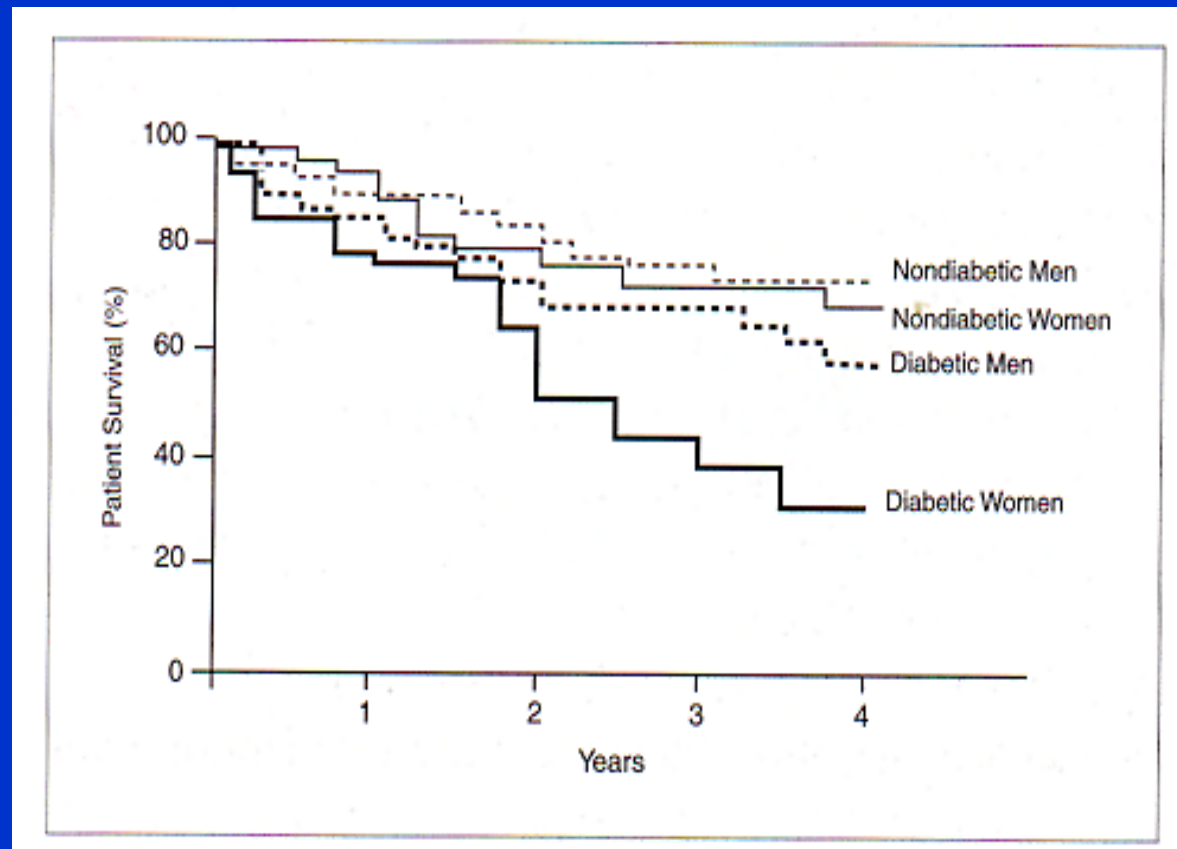
Treatments for Claudication: Cilostazol- Pooled Data on Absolute Claudication Distance



Treatments for Claudication: Revascularization

- **Women are less likely to undergo revascularization than men.**
- **Patency rates are similar for men and women having aortoiliac and infrainguinal revascularization.**
- **Not enough data to determine if there are sex differences in results of endovascular procedures**

Survival after Peripheral Bypass by Gender



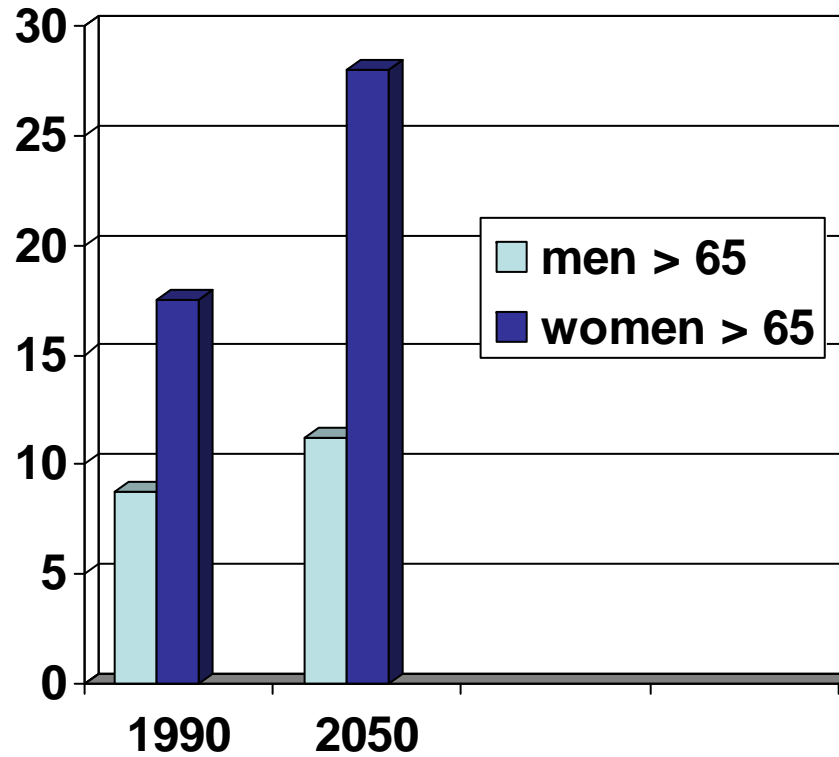
Magnant JG et al.; *J Vasc Surgery* 1993;17:67-68

Summary

- **CVD prevalent in men and women**
- **Women still under-treated, especially those with diabetes**
- **Medical therapy very important to reduce risk of cardiovascular events in men and women**
- **Behavioral changes are of high importance.**

A Greater Percentage of the Population will be Elderly Women

**Percent of
Population
>65 years**



Conclusion

- **Elderly women will represent an increasing proportion of those with CVD in the next 50 years**
- **We need to be prepared to help them age well with good quality of life.**



Acknowledgments

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