

## BI 121 Lecture 9

- I. Announcements** Lab notebook due today! Lab 4 HR & BP.  
Thursday, Lab 5 Blood Chemistry. Read pp 5-1 thru 5-6 x2. Q?
- II. Overview of Labs** HR & BP. Blood chem lab review
- III. Cardiovascular Connections** LS 2012 ch 9

- A. Cardiac cycle? Contract-relax!  
B. ♥'s electrical highway + Pacemaker activity  
LS fig 9-7 p 235, tab 9-1 p 236, fig 9-8 p 237  
C. NHLBI & AHA websites



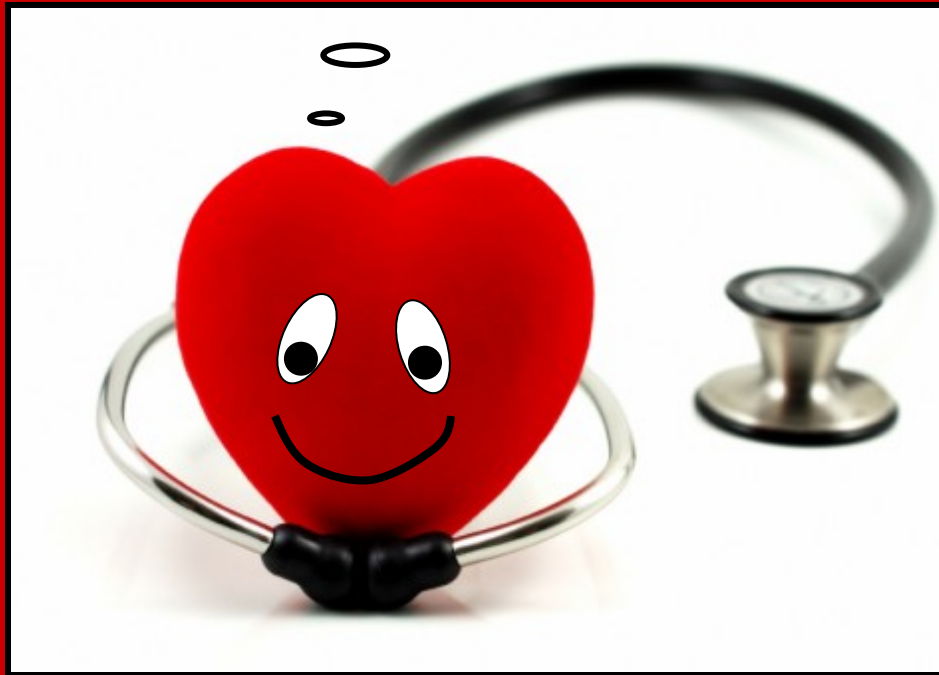
- IV. CV Physiology in the News** NHLBI & AHA websites  
Exercise & Nic? Exercise guidelines: ACSM, AHA, CDC

- V. CV Pathophysiology & Risk Reduction** LS ch 9, 10 +...
- A. AMI, CVA, CVD, PVD, TIA, HTN? + surgical treatments  
B. Atherosclerosis? LS fig 9-27, 9-25, 9-26 pp 266-8  
C. How to minimize risk of CVDs? Treatment triad:  
Exercise, Diet, Drugs + Surgery  
D. Food choices make a difference?  
What's HAPOC?

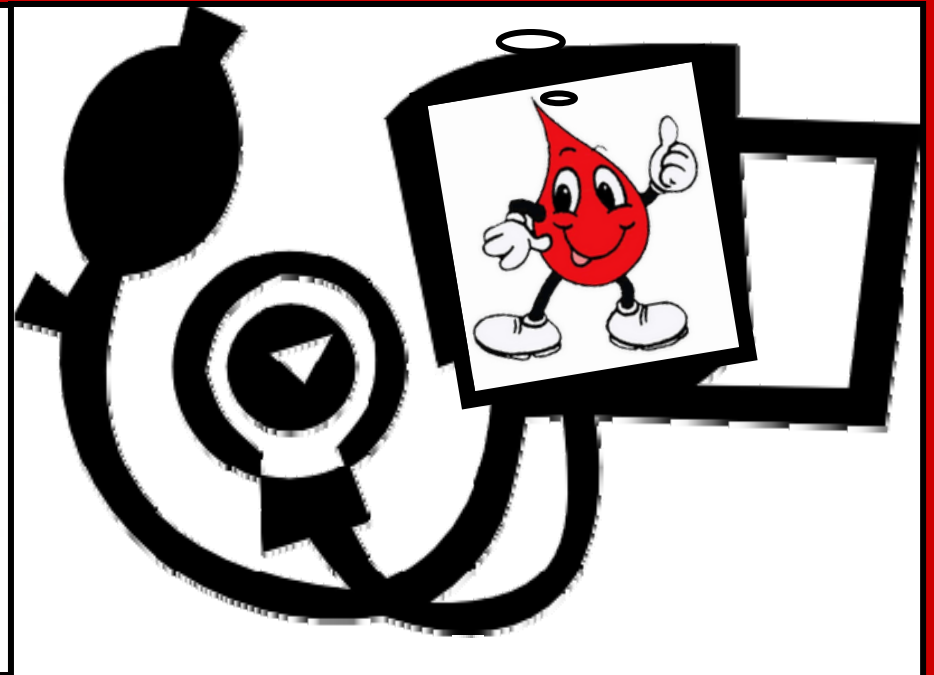


# *Heart-Blood Pressure Lab Today!*

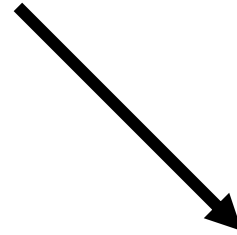
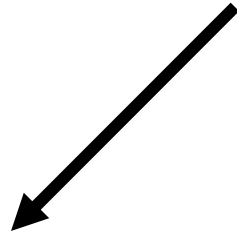
Lub-dup!



I'm cool!



# Cardiac Cycle

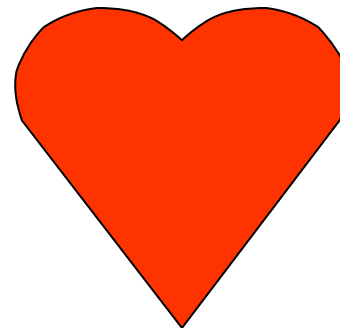
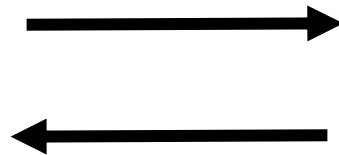
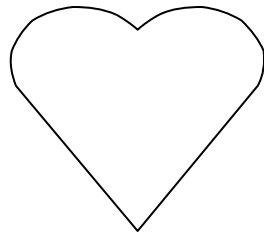


***Systole***

Contract  
& Empty

***Diastole***

Relax  
& Fill



# ***Blood Chemistry on Thursday! No food, drink or gum in lab!***



***Thanks sincerely!***

# PREPARATION



WASH & DRY



ALCOHOL

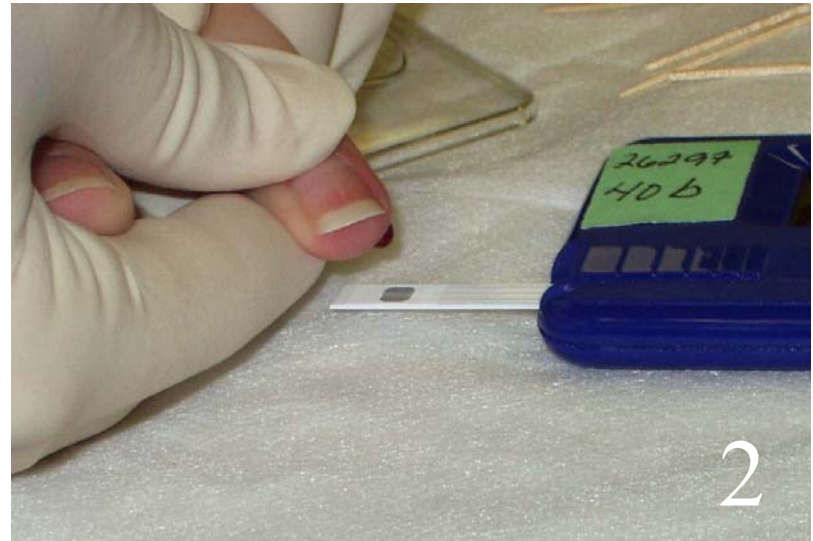


# SAMPLE+TESTS



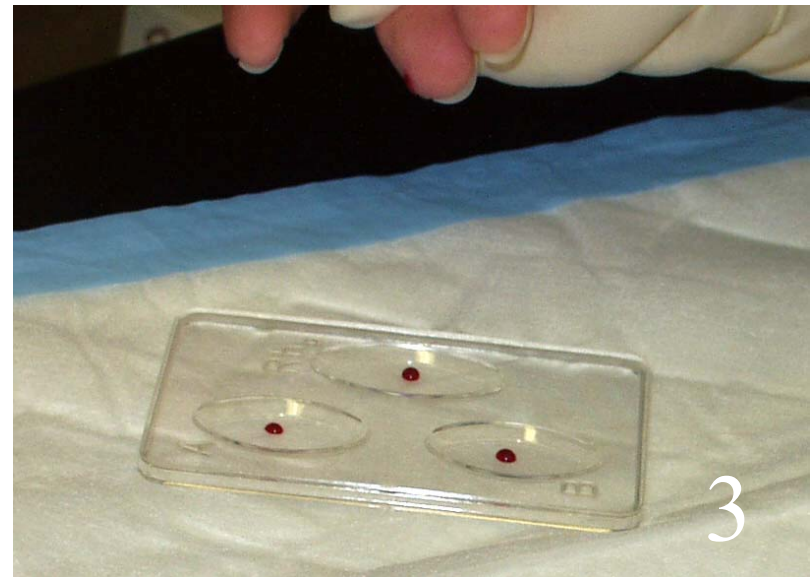
1

OBTAIN  $\mu$ SAMPLE



2

BLOOD GLUCOSE



3

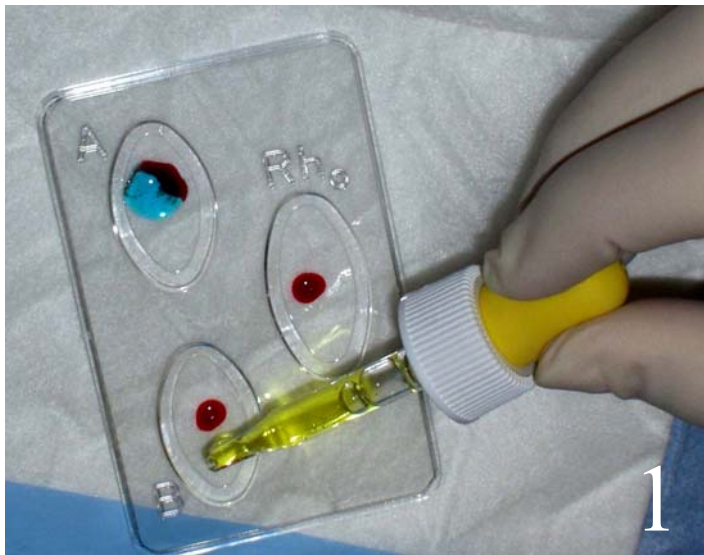
BLOOD TYPING

# BLOOD GLUCOSE

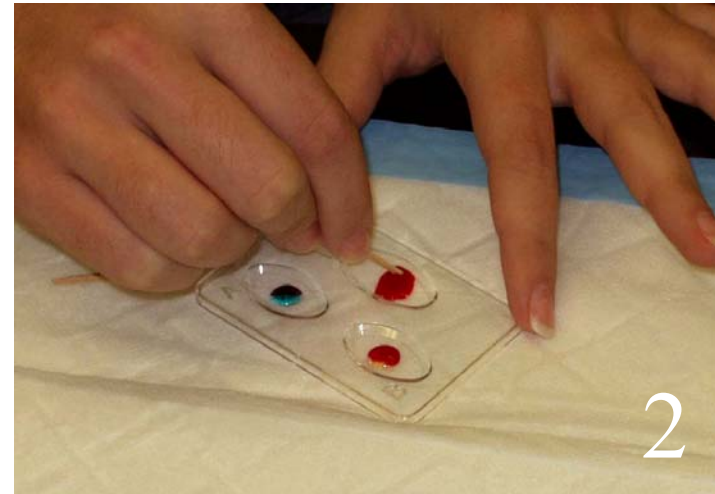


**READ & RECORD!!**

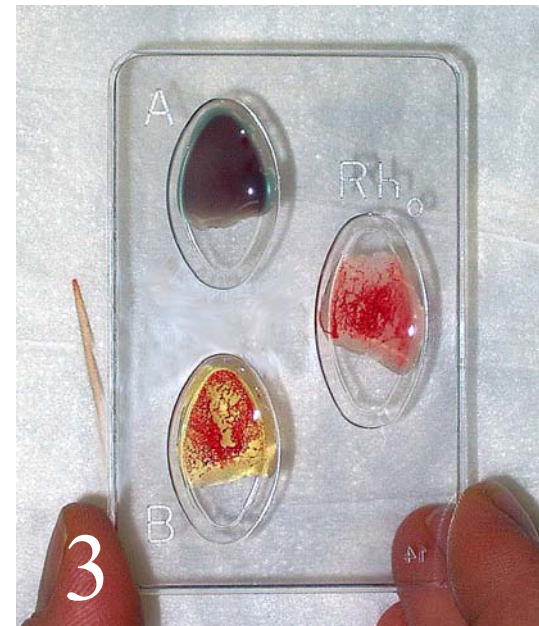
# BLOOD TYPING



ADD ANTISERA



MIX W/TOOTHPICKS



READ & RECORD!!



# CLEAN-UP!



FOLD DIAPER



BLOOD PRODUCTS



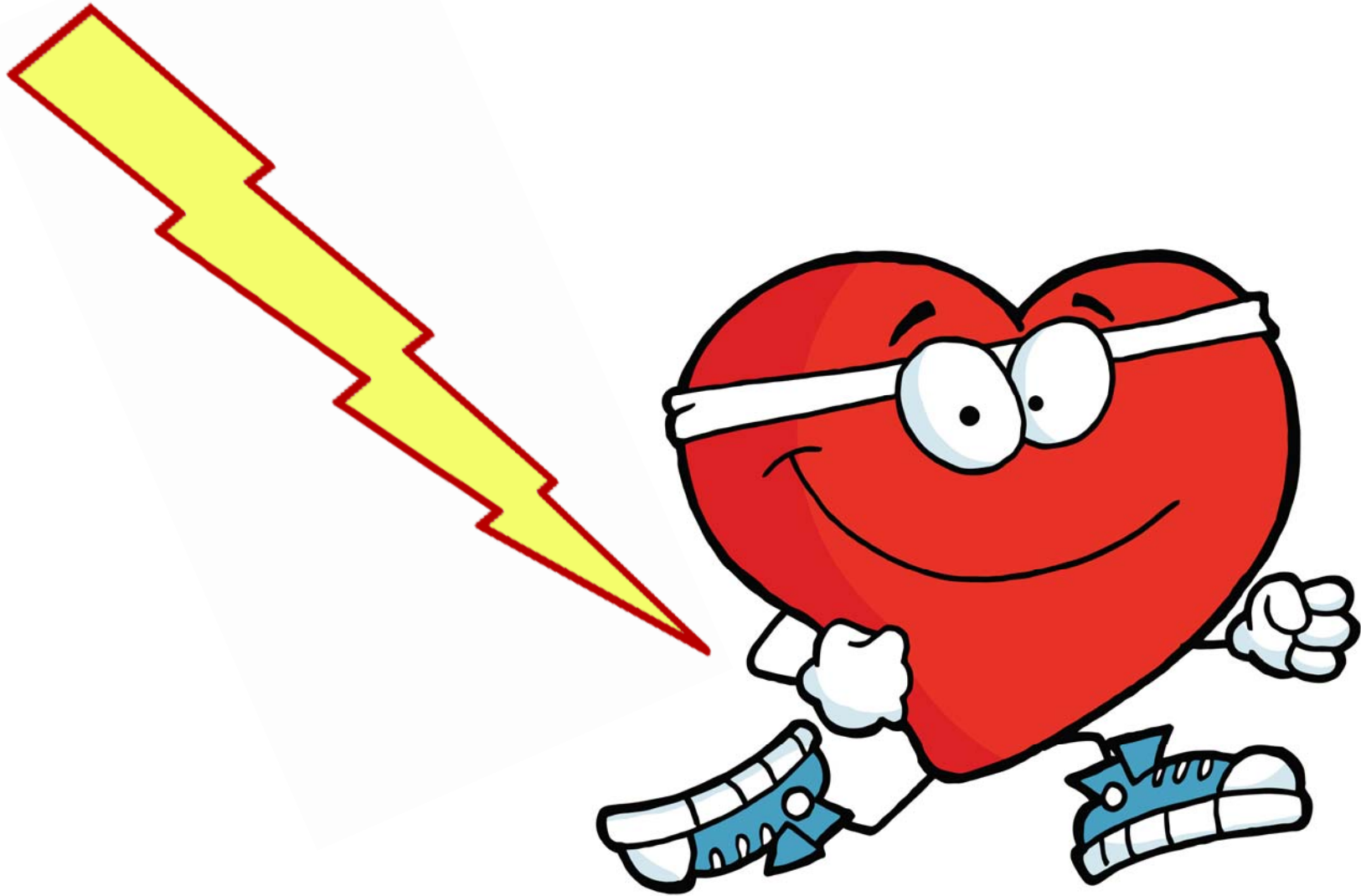
REWASH!!

***Discussion***

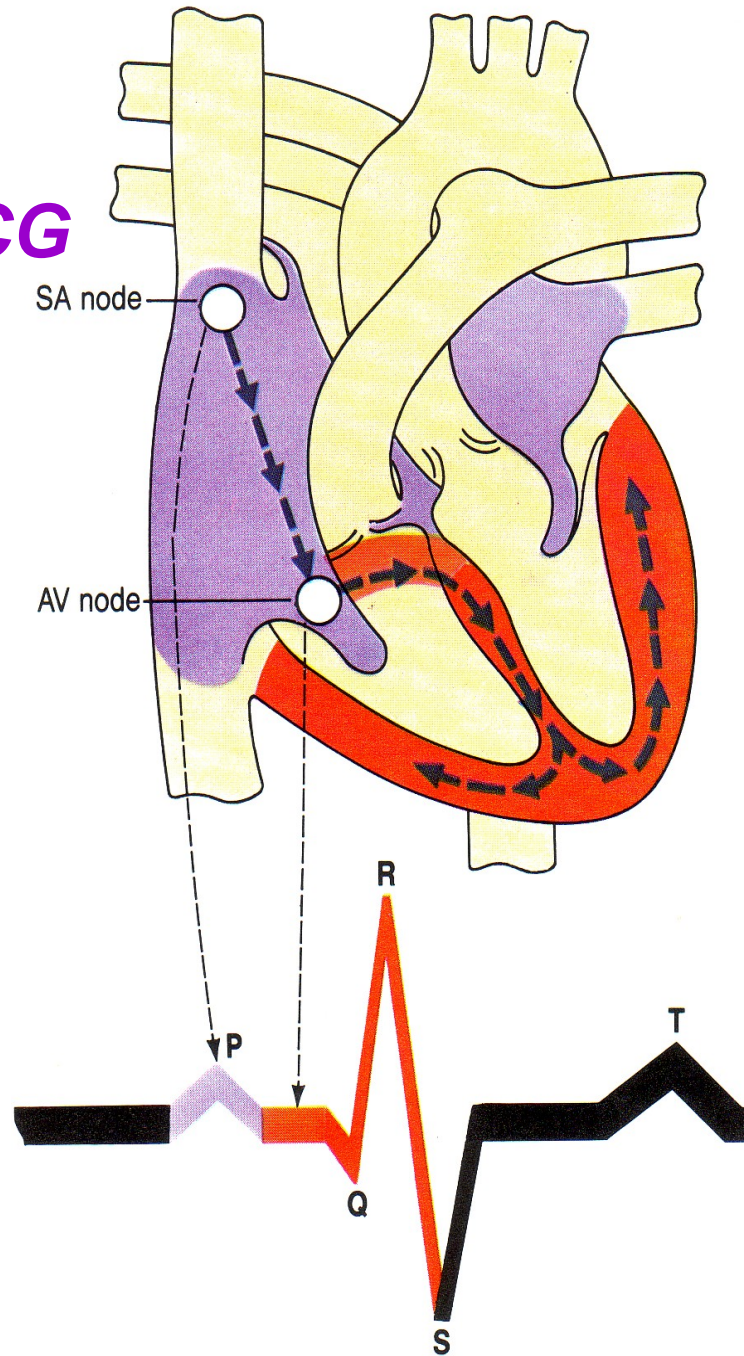
**+**

***Brief Break***

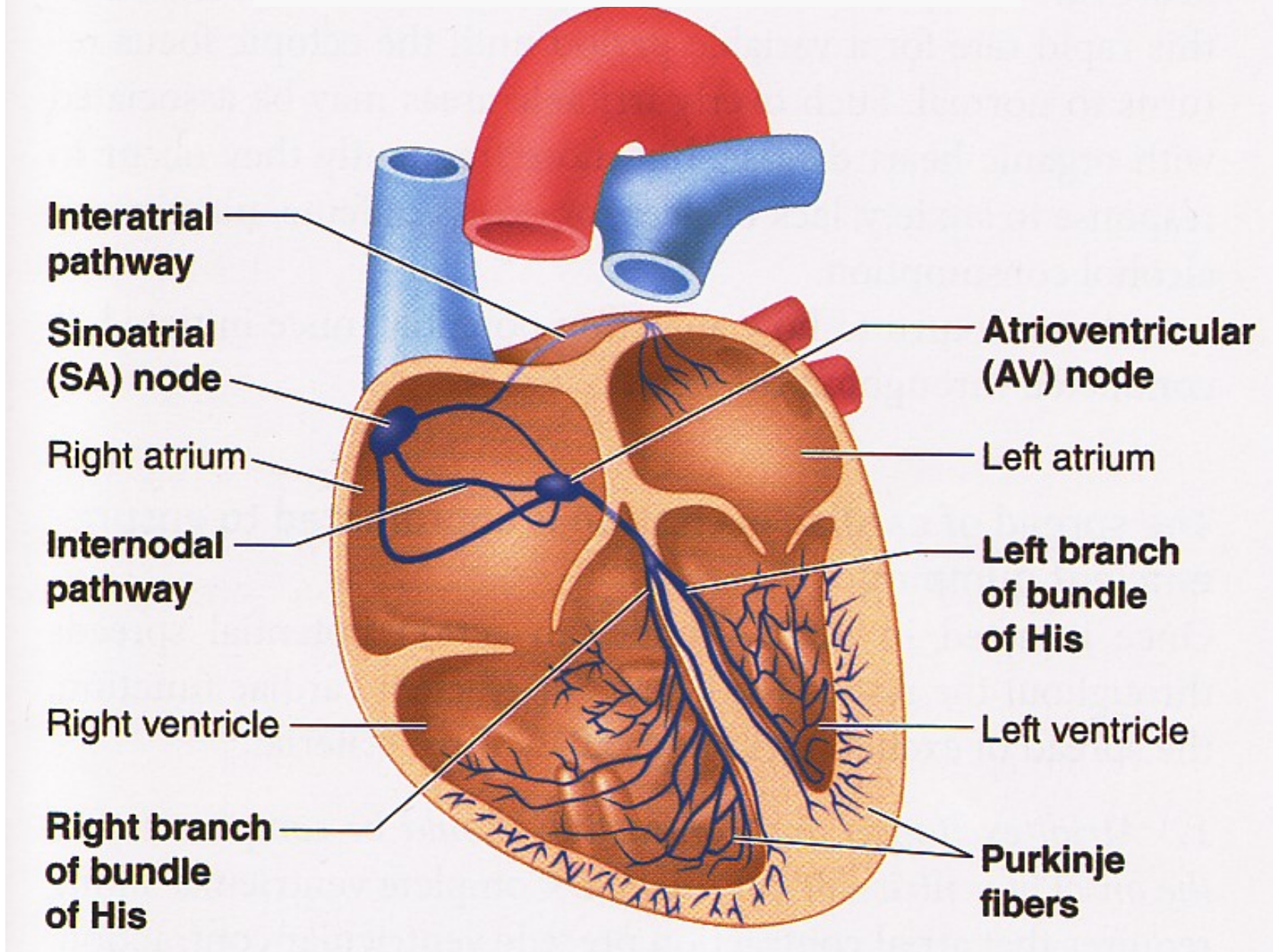
***(Automatically) Shock the Heart then it Contracts!***

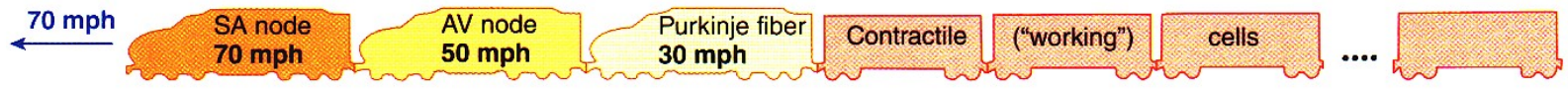


***EKG/ECG  
Origin***

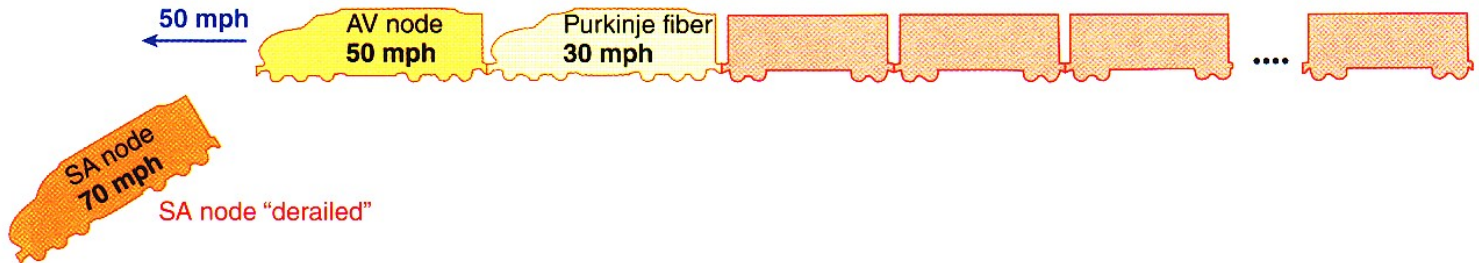


# Heart's Electrical Highway!

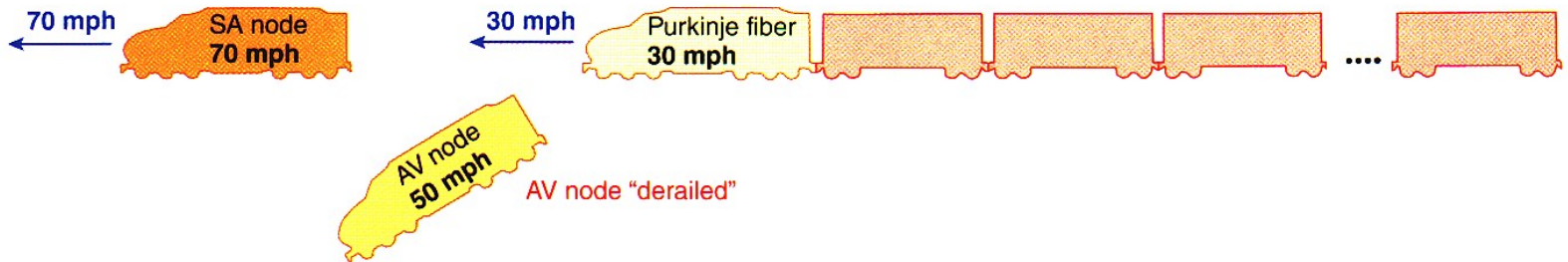




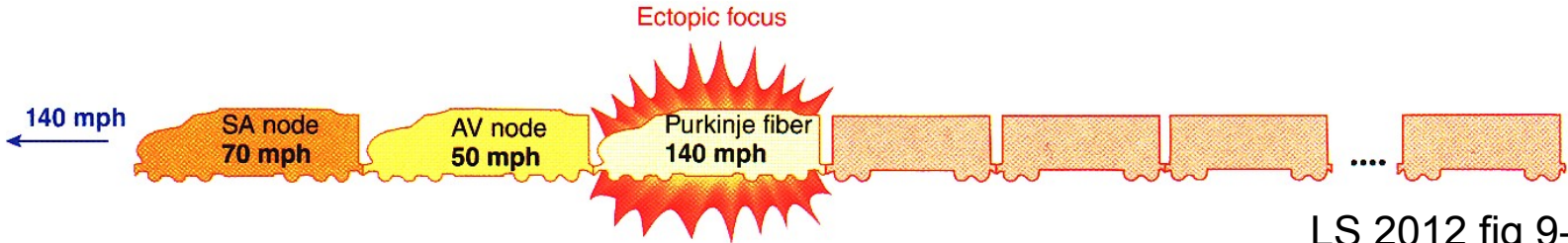
(a) Normal pacemaker activity: Whole train will go **70 mph** (heart rate set by SA node, the fastest autorhythmic tissue).



(b) Takeover of pacemaker activity by AV node when the SA node is nonfunctional: Train will go **50 mph** (the next fastest autorhythmic tissue, the AV node, will set the heart rate).



(c) Takeover of ventricular rate by the slower ventricular autorhythmic tissue in complete heart block: First part of train will go **70 mph**; last part will go **30 mph** (atria will be driven by SA node; ventricles will assume own, much slower rhythm).



# ***American Heart Association (AHA) & National Heart, Lung & Blood Institute***

**<http://www.my.americanheart.org>**



**<http://www.nih/nhlbi.gov>**

Department of Health and Human Services · National Institutes of Health

**National Heart Lung and Blood Institute**

People Science Health





**We all have multimillion-dollar bodies!!**

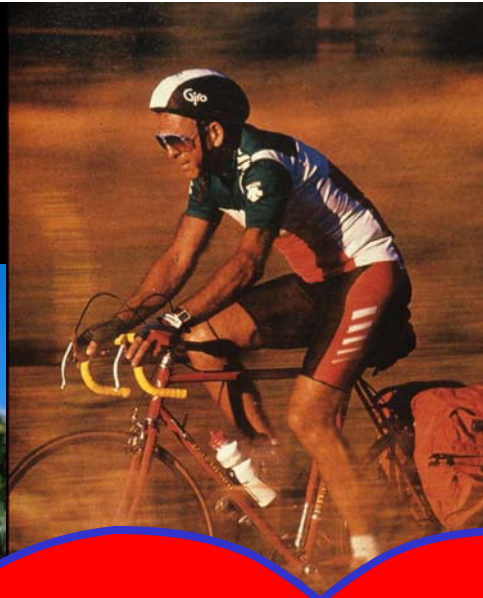
**Can you believe that's Nicole?**

Hollywood glamour queen Nicole Kidman likes to swim to keep that multimillion-dollar body in shape. But the down-to-earth superstar doesn't need a fancy spa — she does her laps at the local YMCA! Nice goggles, Nic!





# How much aerobic?



**Continuous exercise**  
**≥ 50% muscle mass**  
**≥ Conversational pace**  
**≥ 20-30 min/day**  
**≥ 10 min/session**  
**3-5 days/wk**



[http://journals.lww.com/acsm-msse/Fulltext/2011/07000/Quantity\\_and\\_Quality\\_of\\_Exercise\\_for\\_Developing.26.aspx](http://journals.lww.com/acsm-msse/Fulltext/2011/07000/Quantity_and_Quality_of_Exercise_for_Developing.26.aspx)  
<http://www.acsm.org/access-public-information/brochures-fact-sheets/fact-sheets>



**AMERICAN COLLEGE**  
of **SPORTS MEDICINE**

## **Guidelines: Healthy Adults < 65 yr**



**Do moderately intense aerobic exercise  
30 min/d, 5 d/wk**

**OR**

**Do vigorously intense aerobic exercise  
20 min/d, 3 d/wk**

**AND**

**Do 8-10 strength-training exercises  
8-12 repetitions/each exercise, 2 d/wk**

# How much strength?

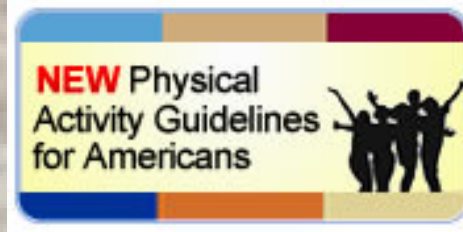
- ✓ 2-3 days/wk
- ✓ 8-10 exercises for major muscle groups
- ✓  $\geq 1$  set/exercise
- ✓ 8-12 (most) or 10-15 (frail/ $> 50-60$  yr) repetitions/set



Federal exercise guidelines include strength training for all

<http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html>

[http://www.usatoday.com/news/health/weightloss/2008-10-07-physical-activity\\_N.htm](http://www.usatoday.com/news/health/weightloss/2008-10-07-physical-activity_N.htm)



**Adults: Moderate to Vigorous Exercise  $\geq$  30 min, 5 d/wk**

**Children: Moderate to Vigorous Exercise  $\geq$  60 min, 5 d/wk**

# CVDs

AMI

CVA



TIA

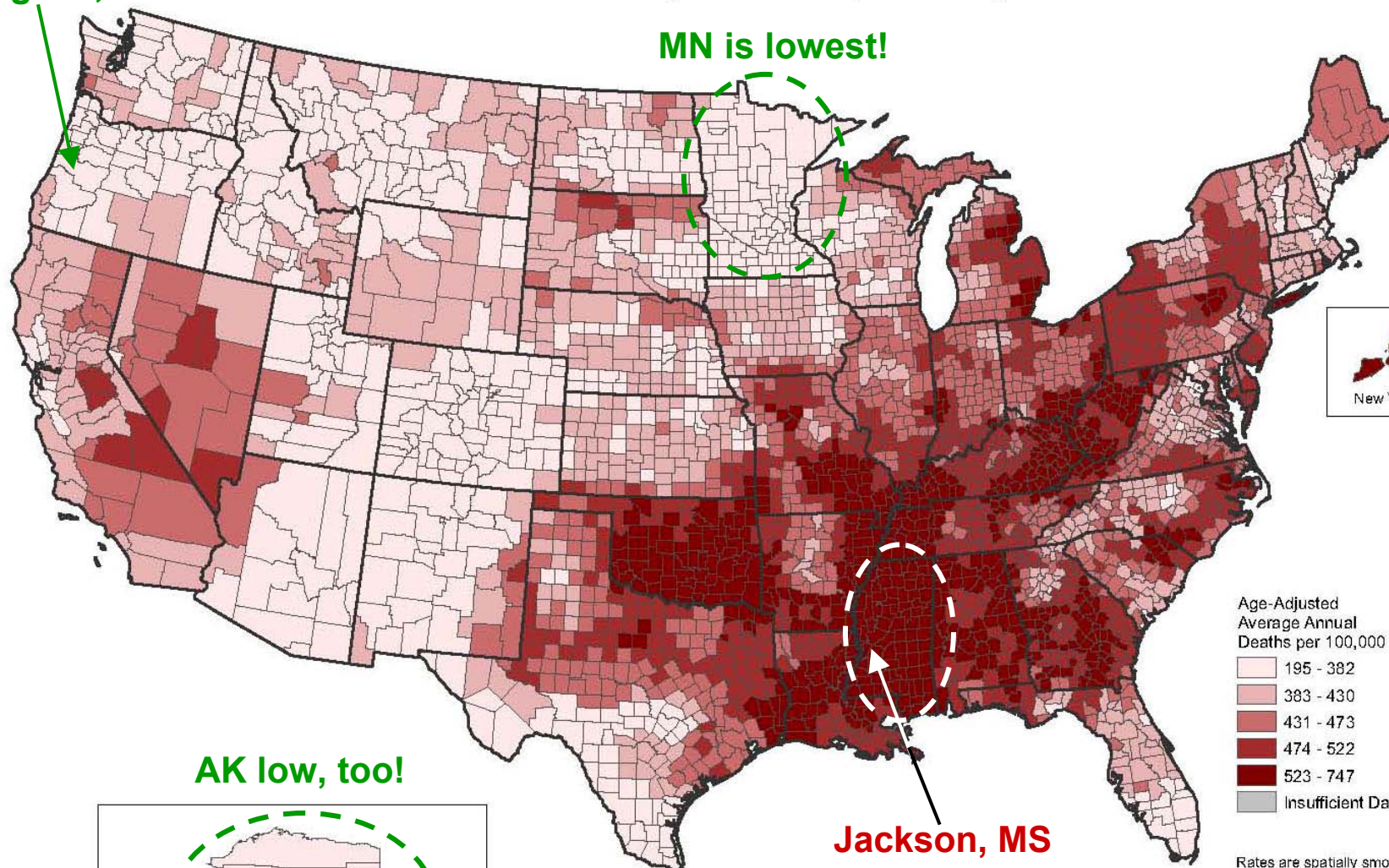
HTN

PVD

# Heart Disease Death Rates, 2000-2006 Adults Ages 35+, by County

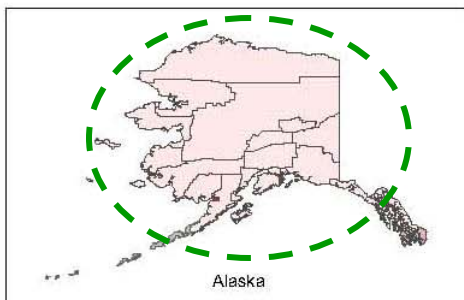
Eugene, OR

MN is lowest!



Age-Adjusted Average Annual Deaths per 100,000	Number of Counties
195 - 382	632
383 - 430	648
431 - 473	629
474 - 522	624
523 - 747	606
Insufficient Data	2

AK low, too!



Jackson, MS

Rates are spatially smoothed to enhance the stability of rates in counties with small populations.

ICD-10 codes for heart disease: I00-I09, I11, I13, I20-I51

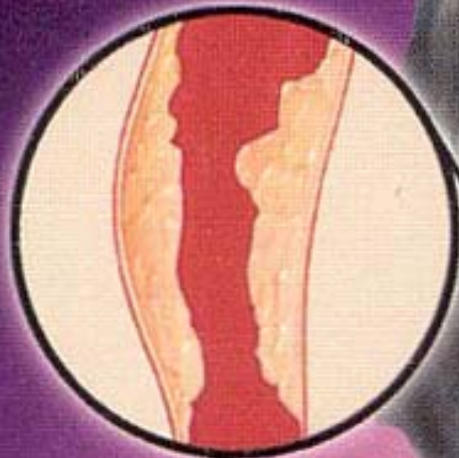
Data Source: National Vital Statistics System and the U.S. Census Bureau

# Did you know?

- **Every year ~785,000 Americans have a first heart attack. Another 470,000 who've had  $\geq 1$  have another attack.**
- **In 2008, > 616,000 people died of heart disease. Heart disease caused almost 25% of deaths in the US.**
- **In 2010, coronary heart disease US costs ~\$108.9 billion including health care, medications & lost productivity.**

*SOURCE:* Heart Disease Facts, Centers for Disease Control, 2012

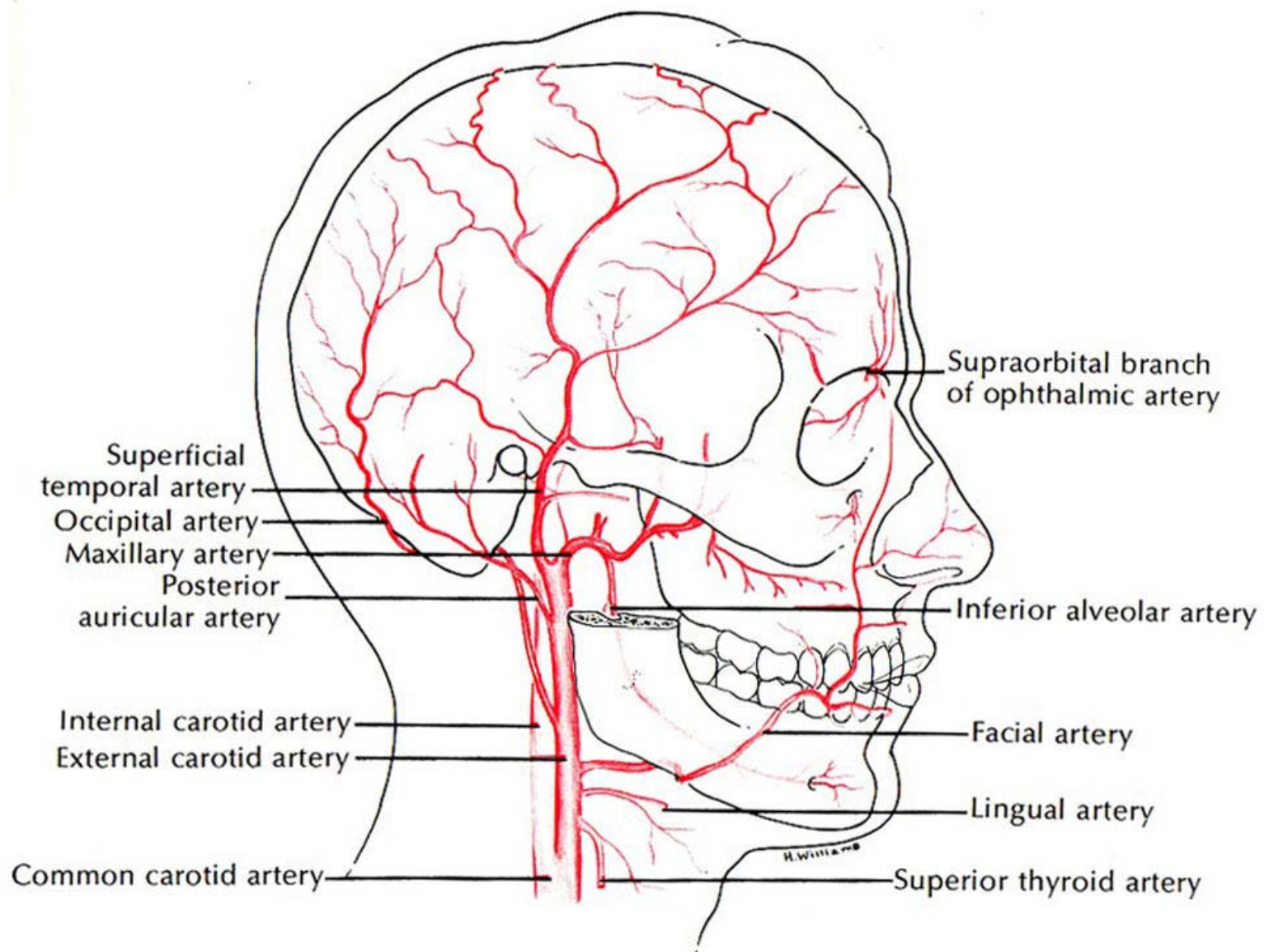
**DISEASED CAROTID ARTERY**



**HEALTHY CAROTID ARTERY**

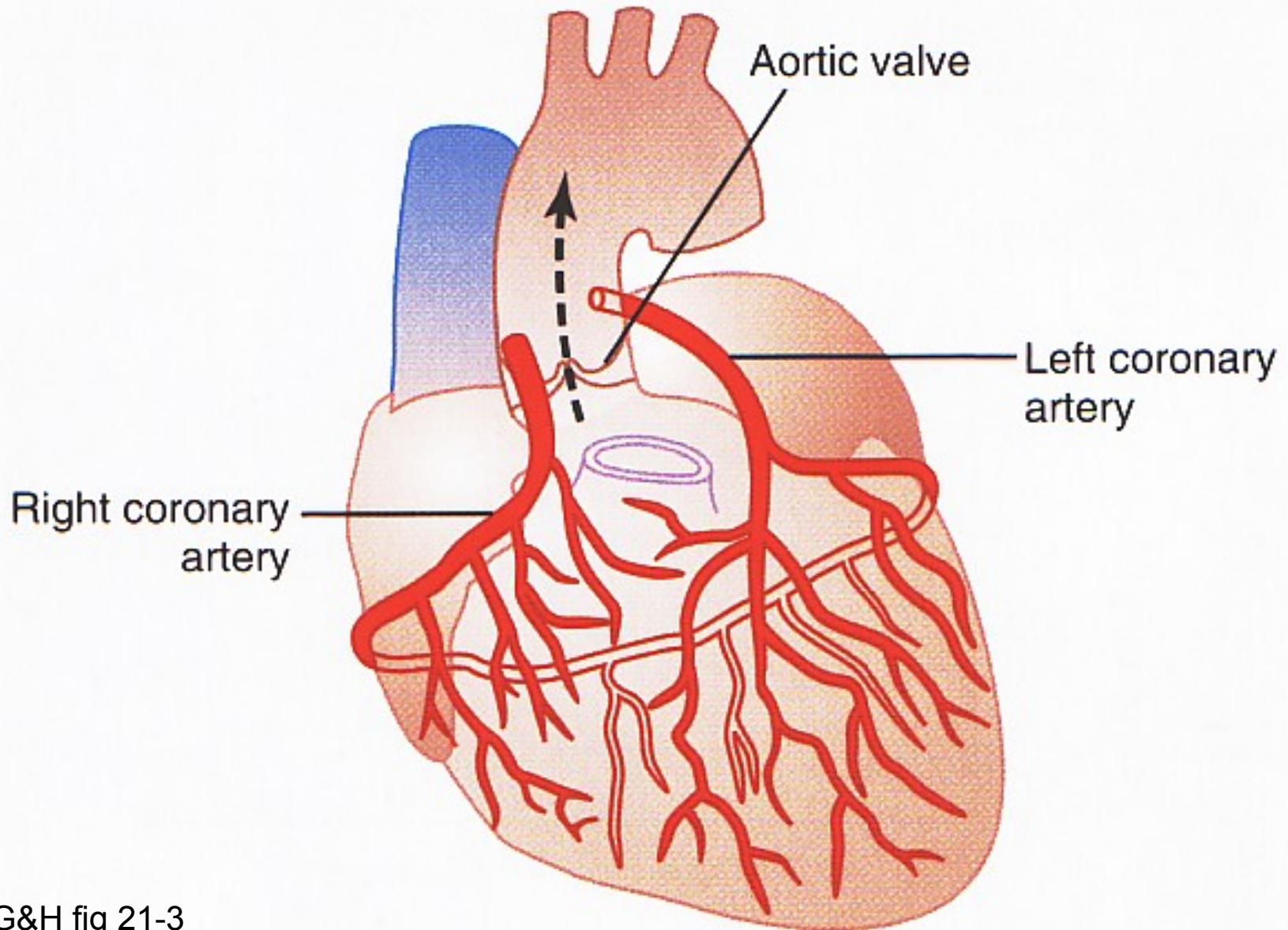
Source: Lifeline Screening, 2007





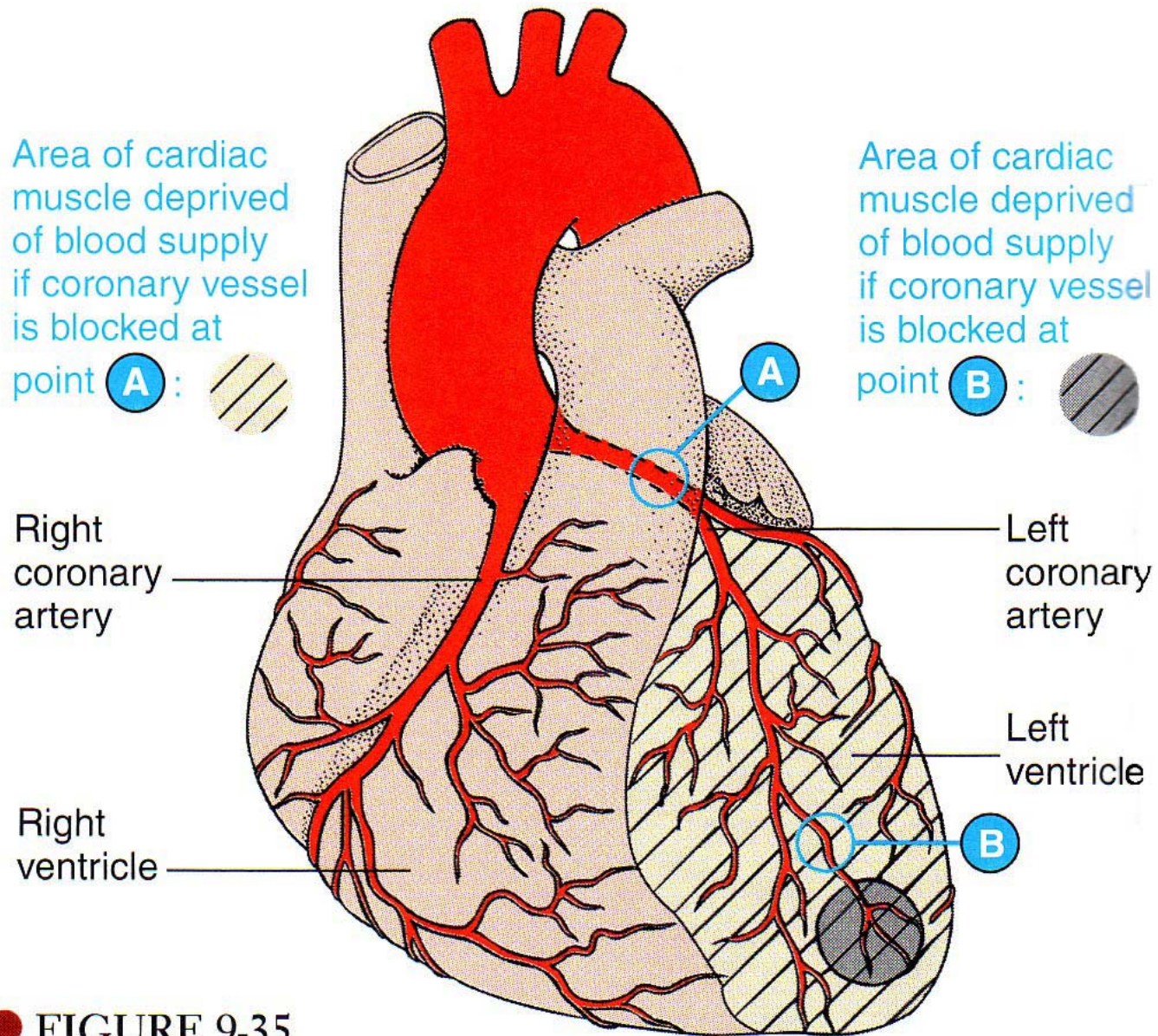
Source: Francis & Martin, 1975, p 291.

# ***Coronary Circulation ≡ Crowns the Heart!***



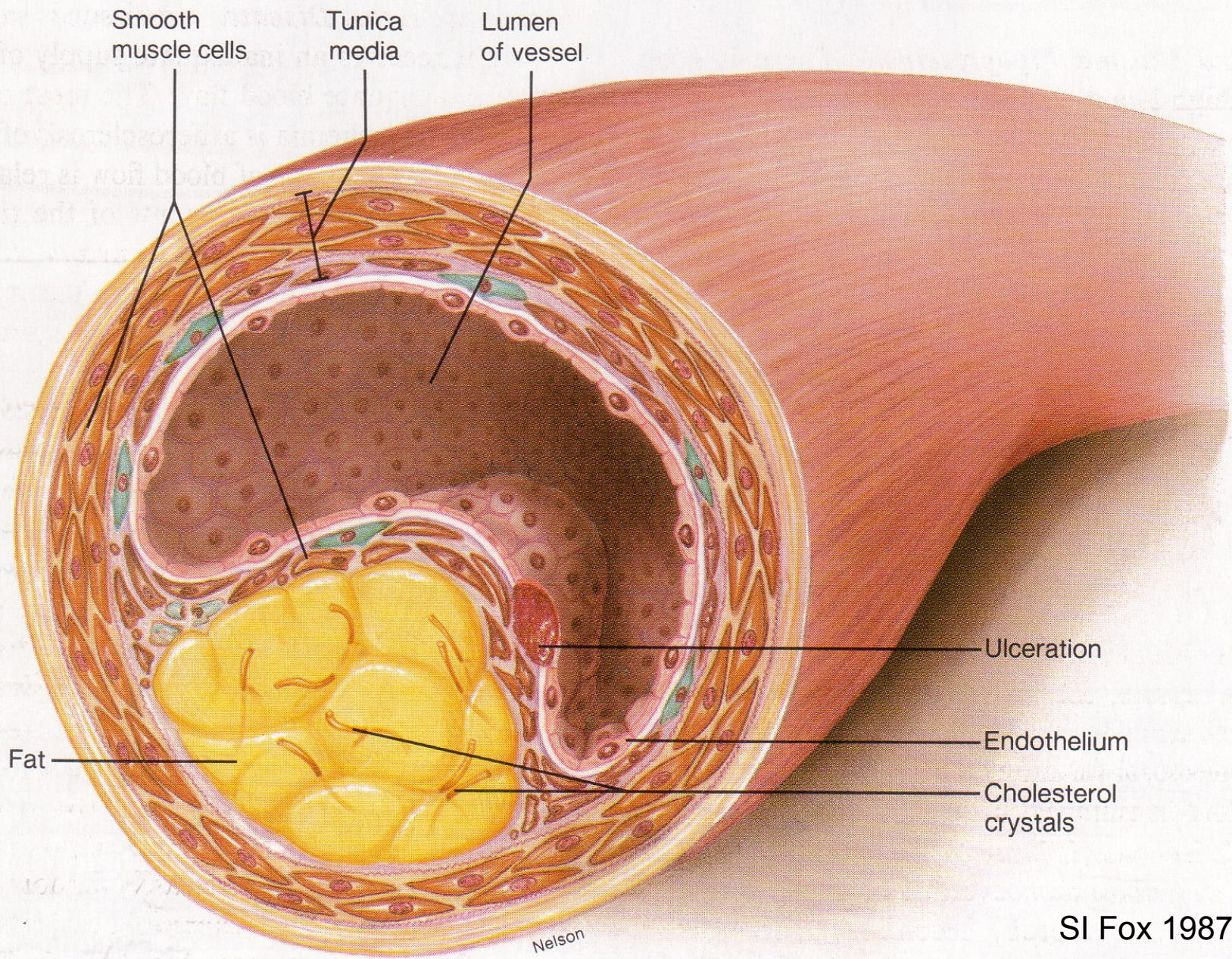
G&H fig 21-3





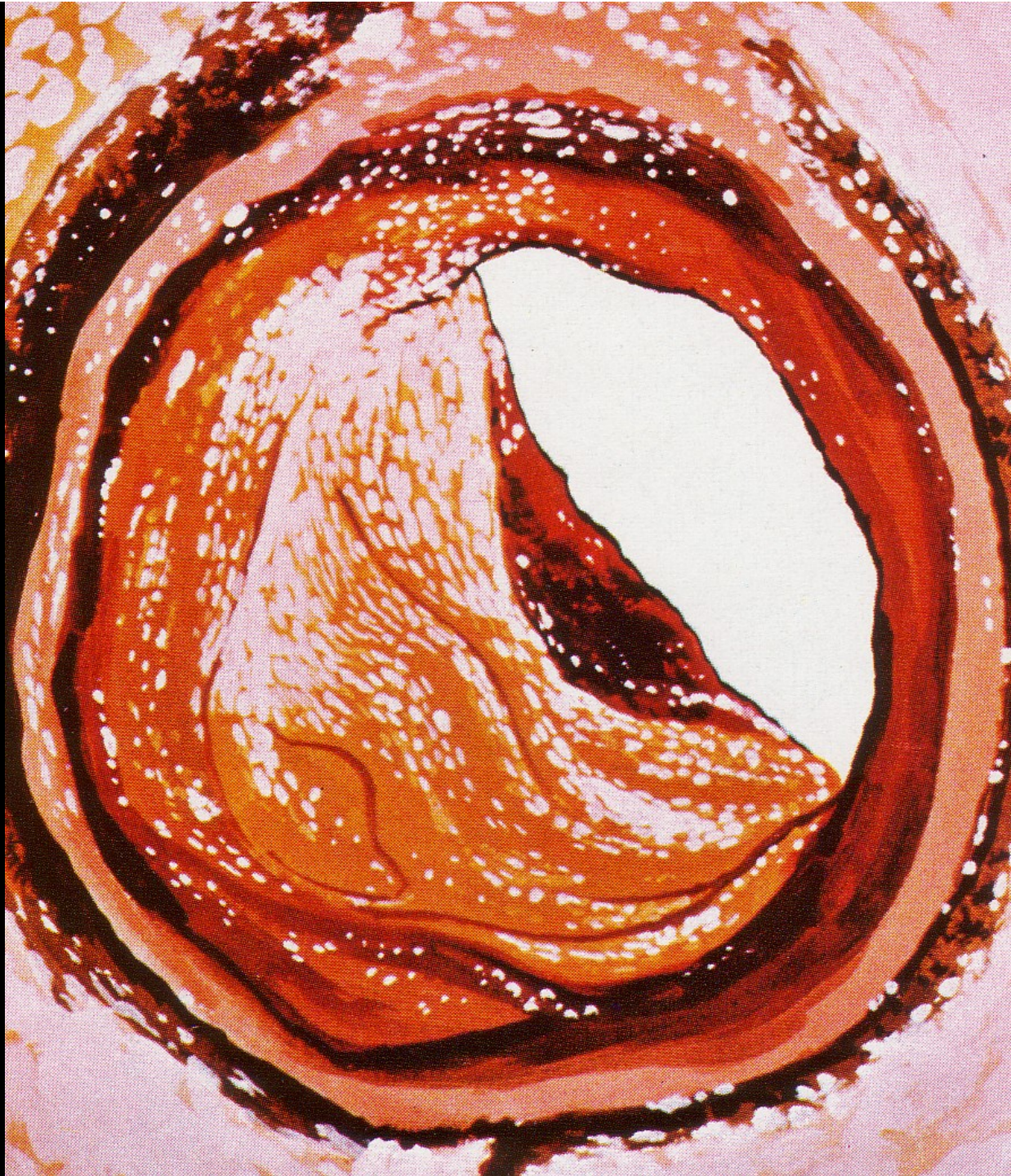
**● FIGURE 9-35**

Extent of myocardial damage as a function of the size of the occluded vessel

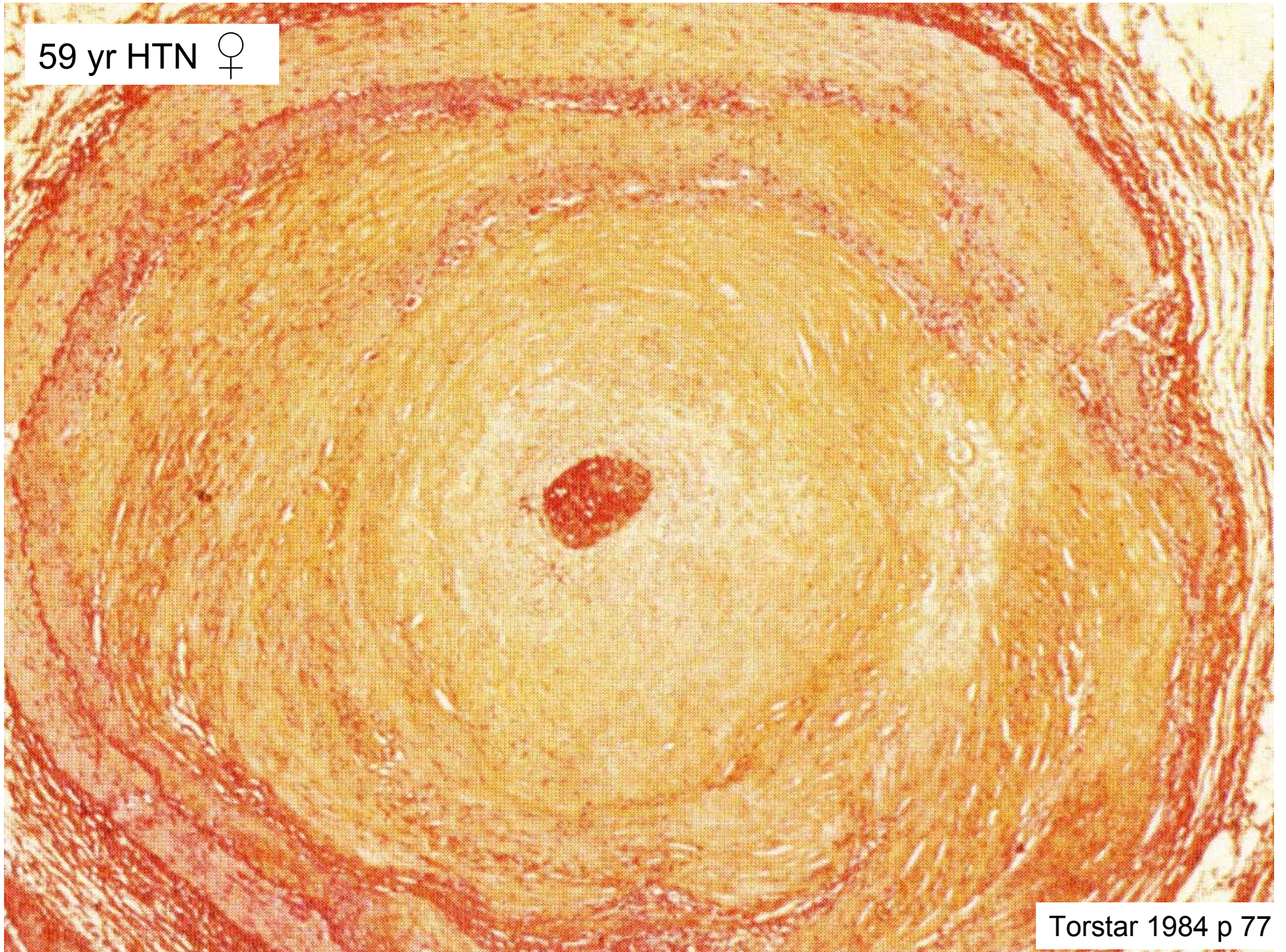


100 yr ♀





59 yr HTN ♀



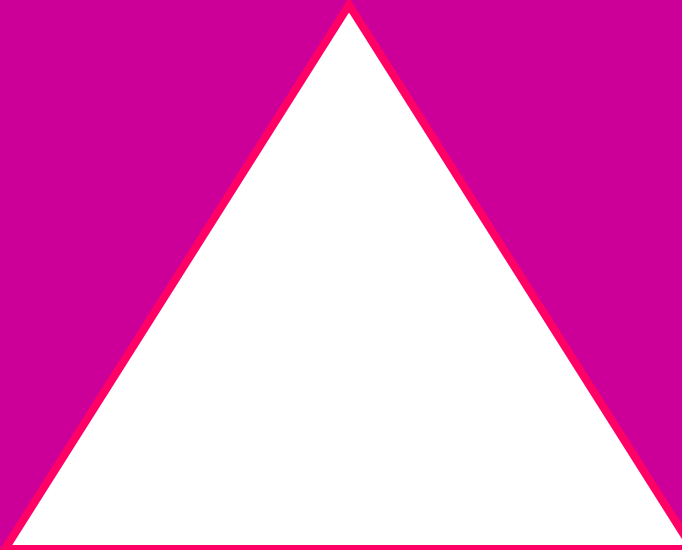


# ***Treatment Triad***

NB: Last blasted resort!!

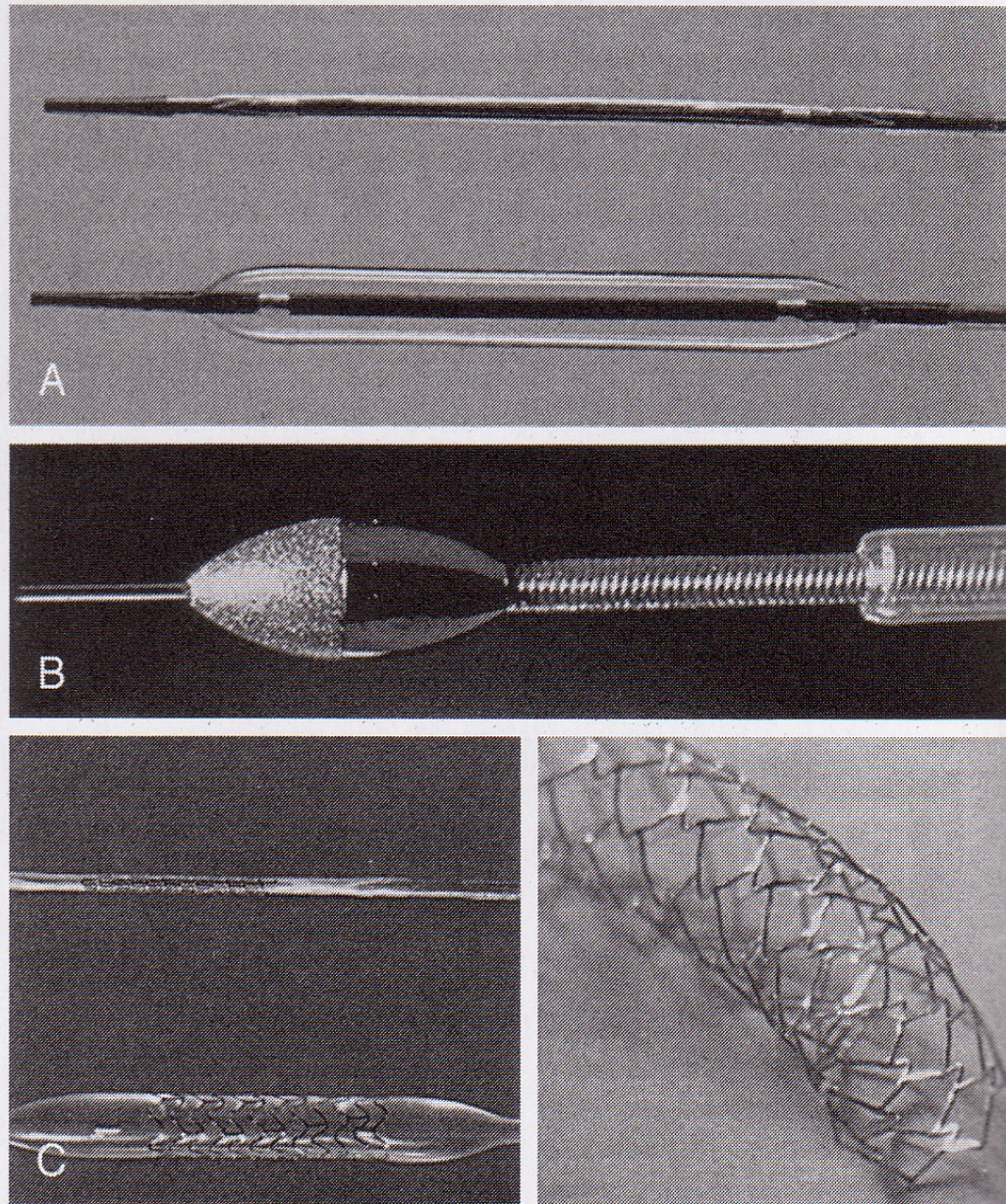


***Drugs/Surgery***

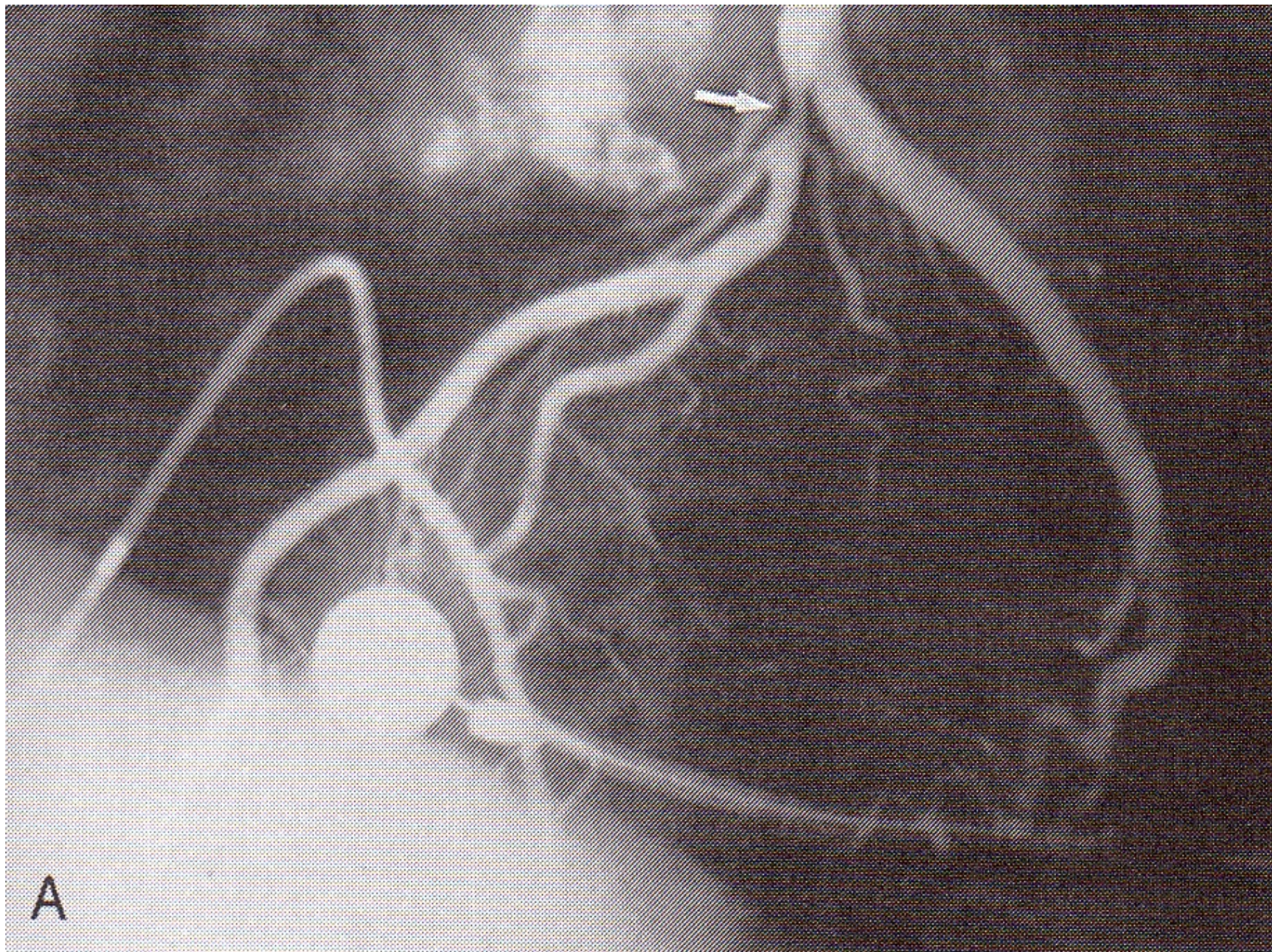


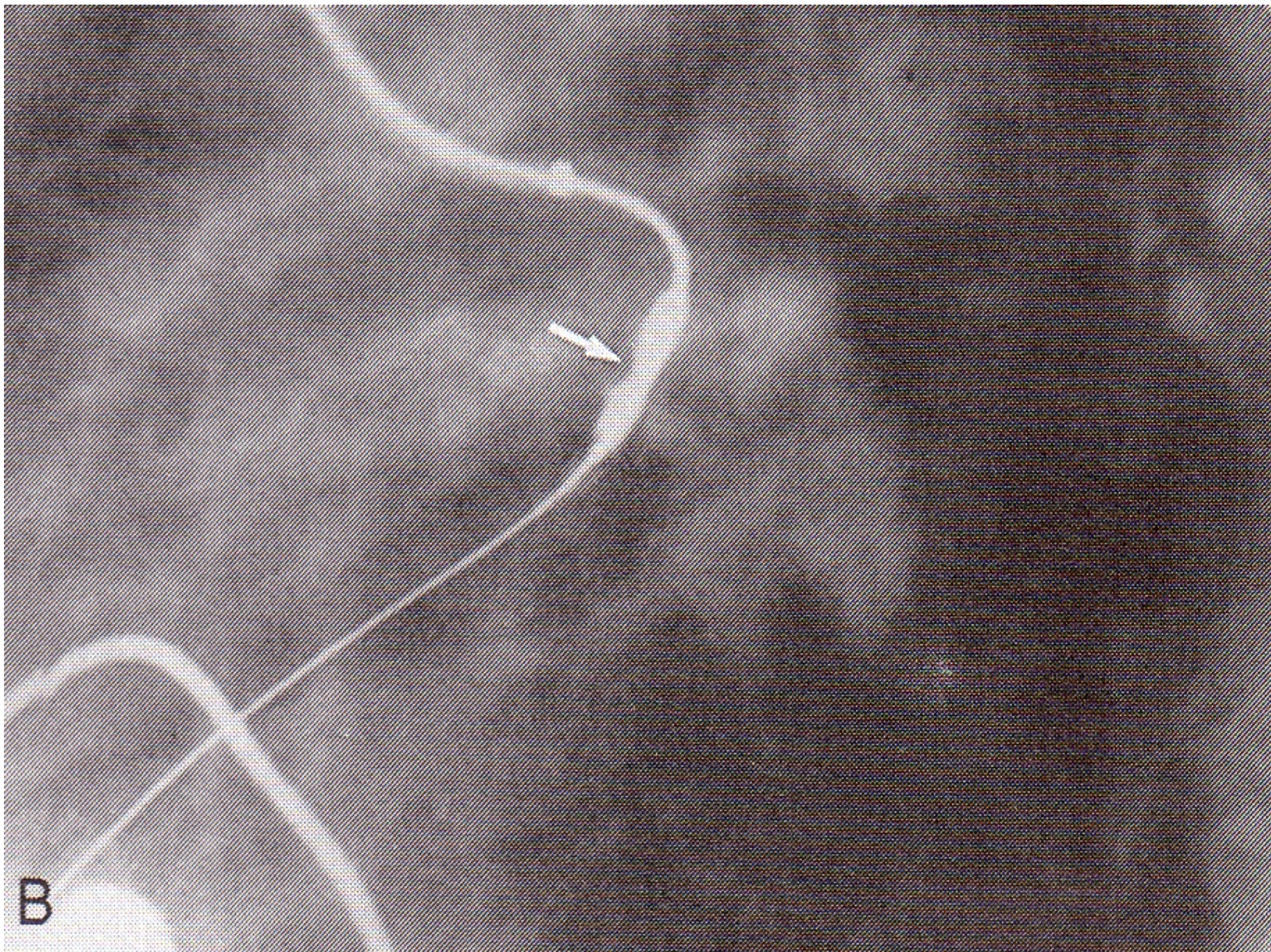
***Exercise***

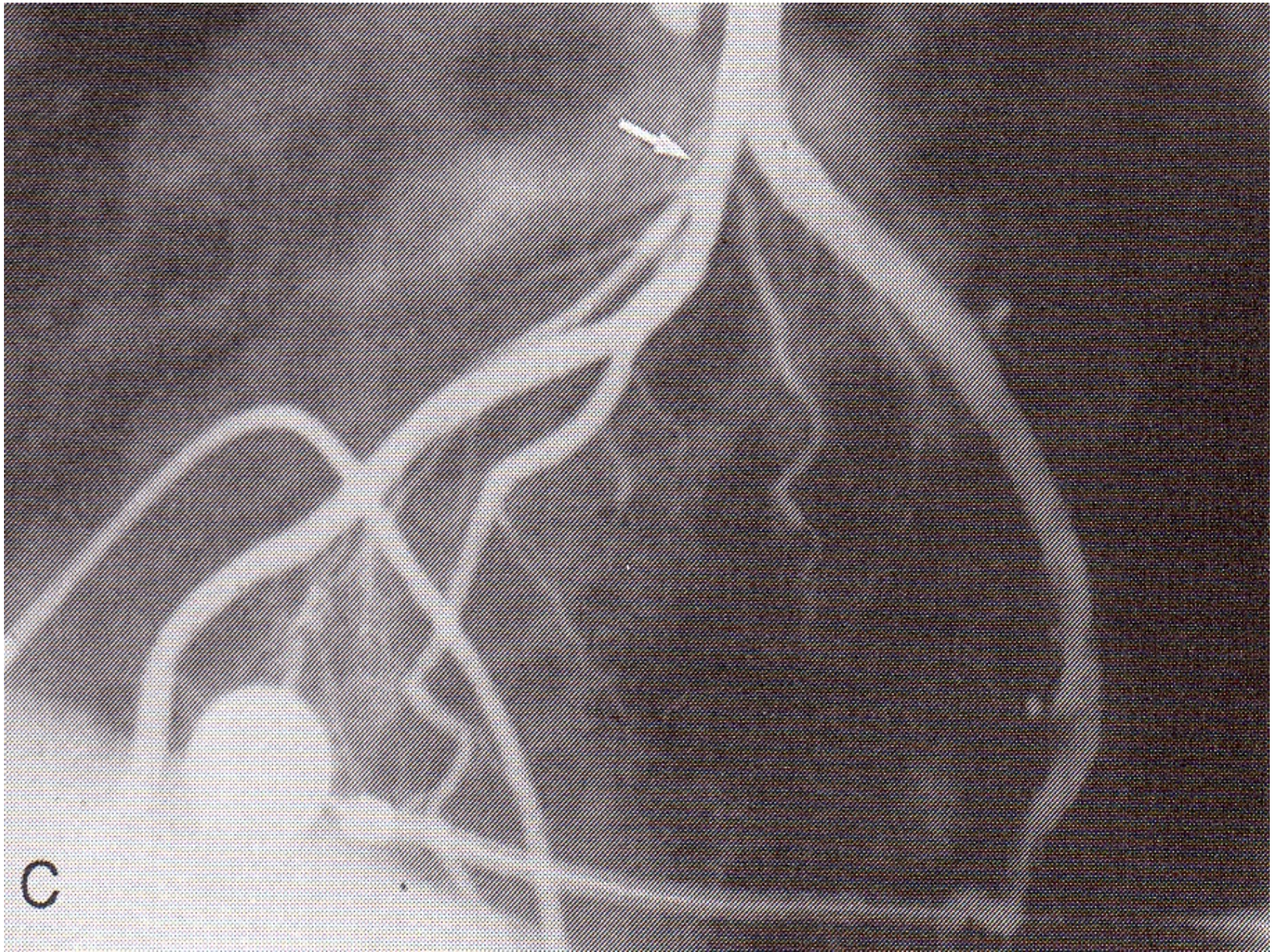
***Dietary  
Modification***

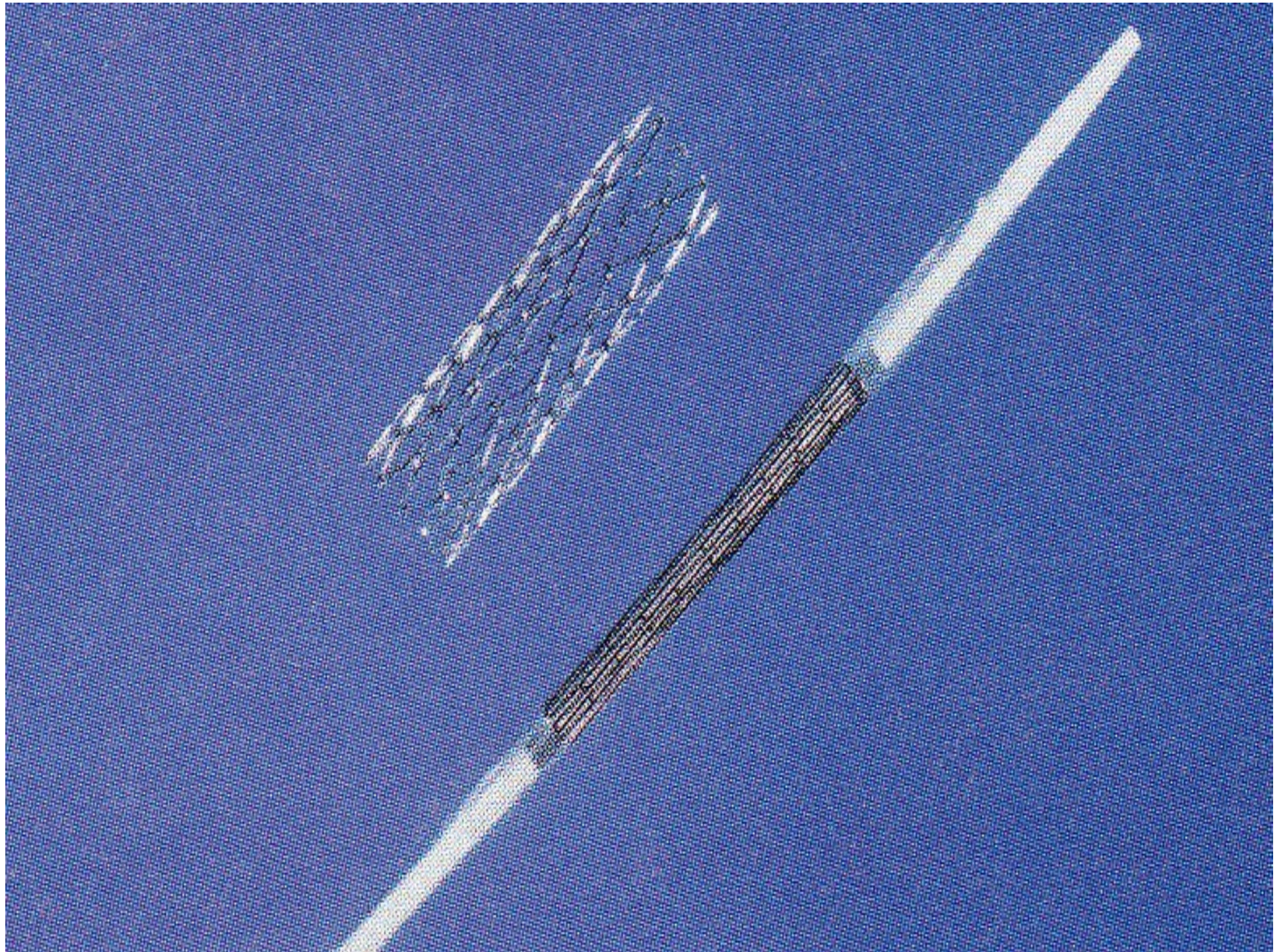


**FIGURE 37-1** Devices for percutaneous transluminal coronary interventions. **A**, Coronary balloon. **B**, Rotational atherectomy burr (Rotablator). **C**, Coronary stent.

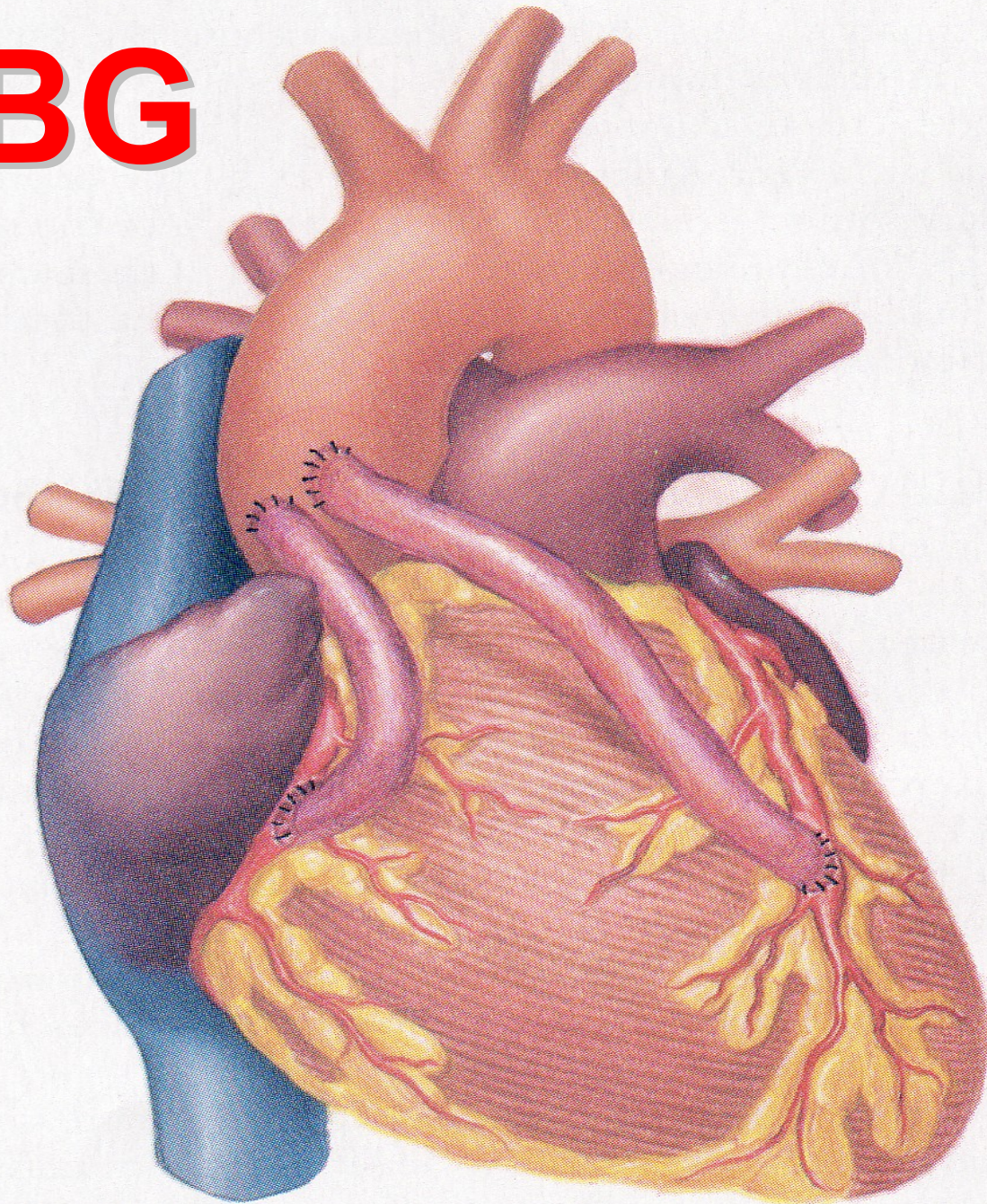


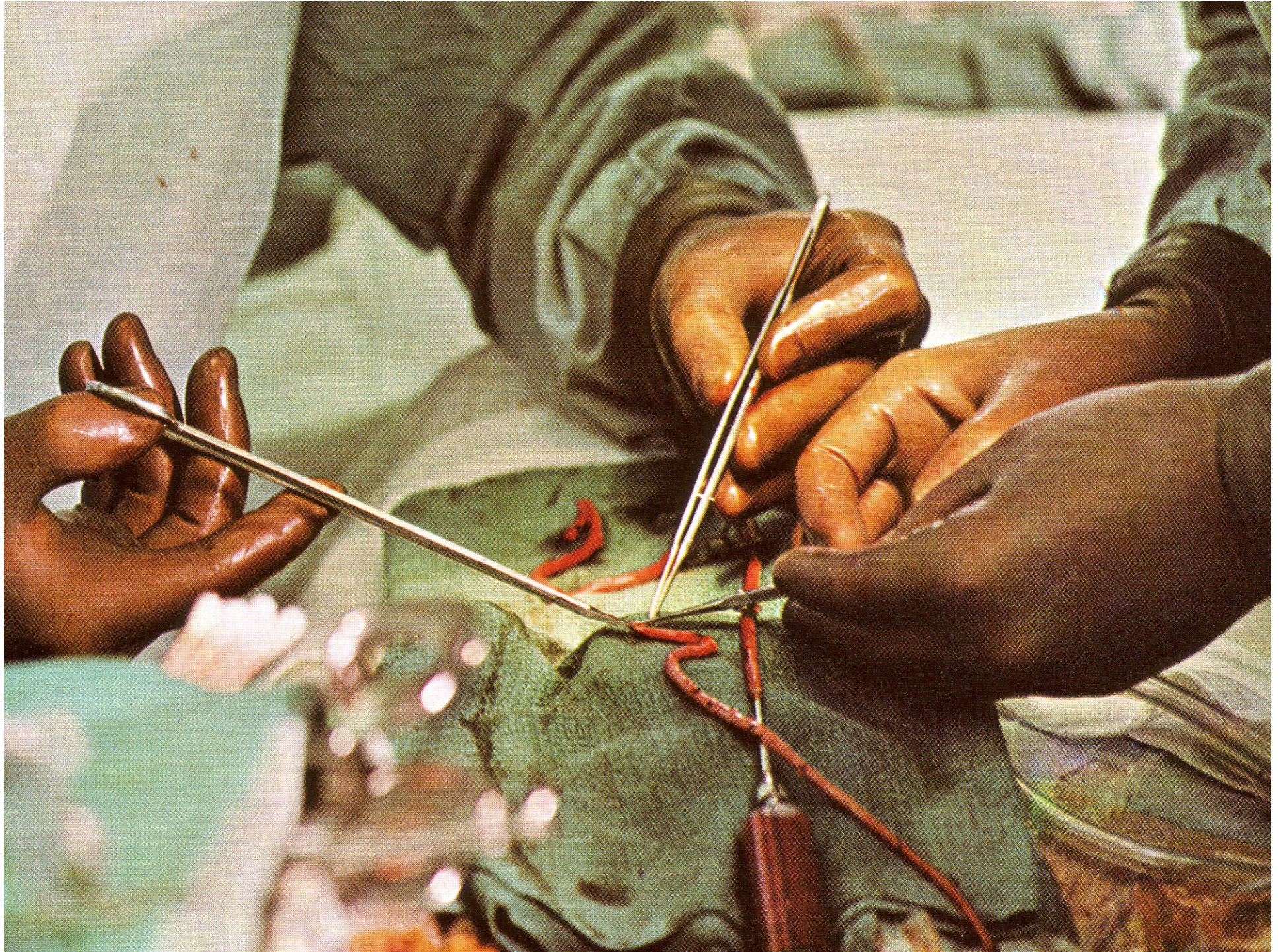




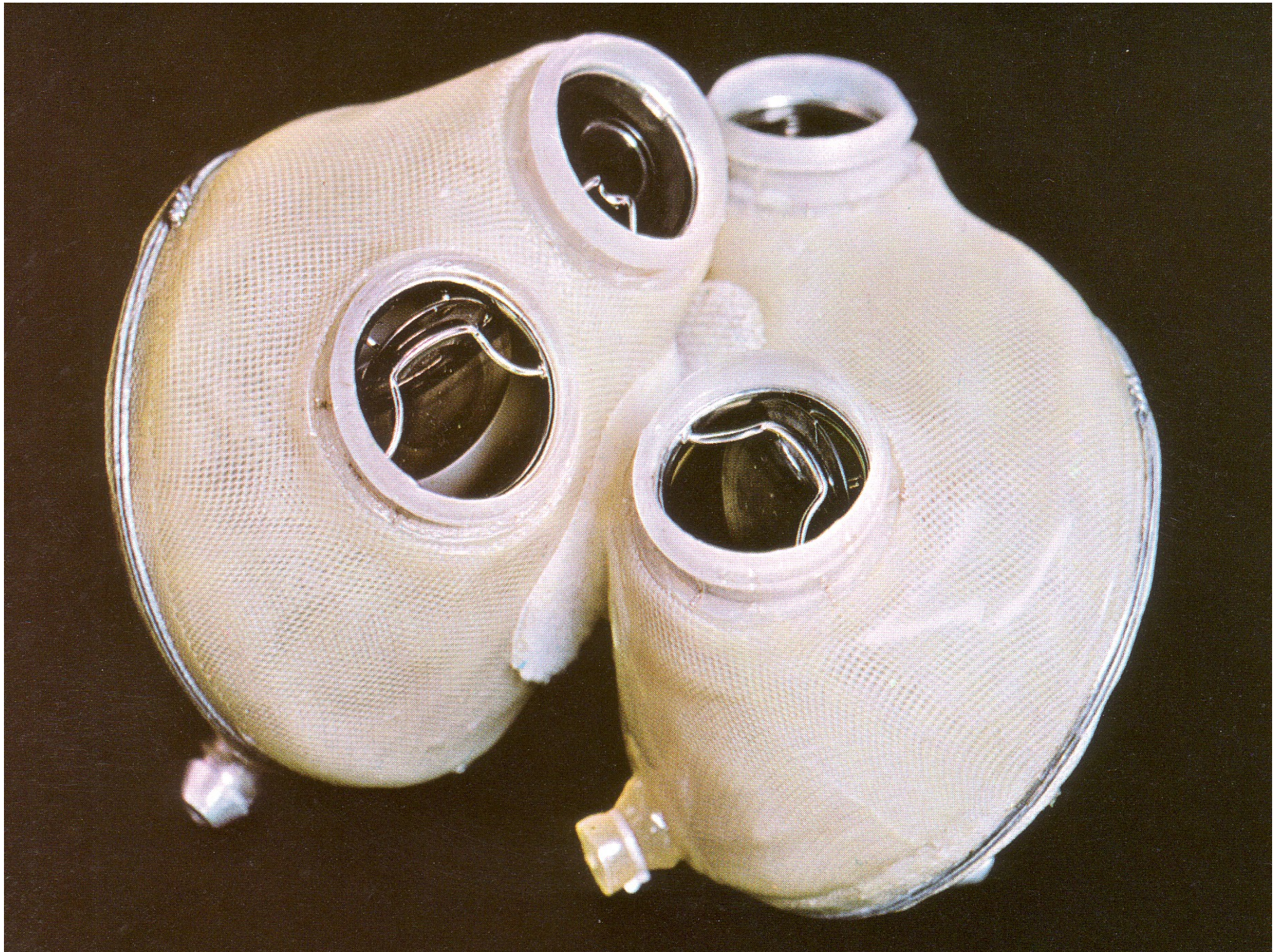


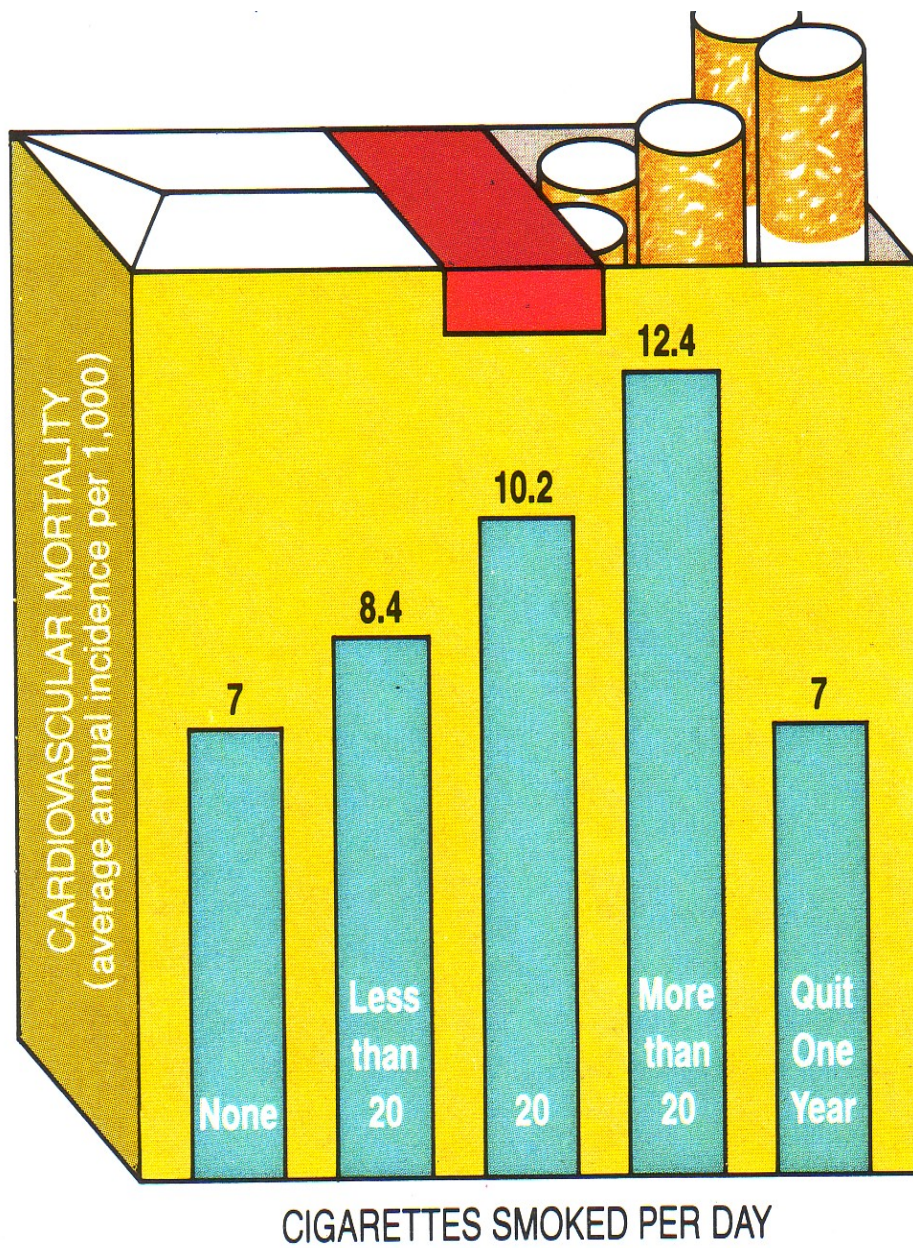
# CABG











# OREGON DAILY EMERALD

The independent student newspaper at the University of Oregon

dailymerald.com

SINCE 1900 | Volume 109, Issue 2 | Wednesday, June 27, 2007



# SMOKED OUT

Governor Kulongoski signed a bill banning smoking in almost all public buildings

STEVEN NEUMAN  
News Editor

The last gasp of public smoking in Oregon took a final puff Tuesday before Gov. Ted Kulongoski signed a bill into law that banned smoking in bars, bowling alleys and bingo halls.

Those establishments will become smoke-free in January 2009, but hotels will still be able to designate up to 25 percent of their rooms for smoking and smoke shops and cigar bars will be exempt.

Kristina Edmunson a spokeswoman for the governor said Kulongoski discussed how some bills are transformational in scope, and he considers this to be one for that category.

"For the 35,000 workers who have endured smoke in the workplace this about a legacy," she said.

## ROOM TO BREATHE

The new law bans smoking in bars, bowling alleys and bingo halls beginning in January 2009, but hotels will still be able to designate up to 25 percent of their rooms for smoking. Smoke shops and cigar bars will also be exempt.

The legislation closes a number of loopholes in the state's 2001 indoor smoking regulation, which banned smoking in restaurants.

## LAW ENFORCEMENT

# EPD seeks public input on Taser use policies

A committee dedicated to police use of force will hold a meeting tonight at 7 p.m. to discuss Taser implementation

JILL AHO  
News Editor

The Use of Force/Taser Policy Committee will take public input about how and when Eugene police officers should employ the use of Tasers tonight at 7 p.m. in the EWEB Training Center, 500 East 4th Ave.

The Eugene Police Department has determined it will purchase Tasers for a pilot project, and the committee has constructed a draft of policies ready for public input, said committee chairman John Brown.

"When can the officers deploy a Taser is a huge question, under

## COMMITTEE MEETING

**When:** Tonight, 7 p.m.

**Where:** EWEB Training Center, 500 East 4th Ave.

**Why:** To gather public input regarding a policy about the use of Tasers by Eugene police

**Presenters:** Dave Fidanque and Claire Sweet of the AFLE

# Tobacco-free Campus

For better health,  
smoking and use of  
tobacco products are  
prohibited everywhere  
on our property.



UO's Josh Buehler

U.S. Surgeon General  
Regina Benjamin

## SMOKE AND TOBACCO-FREE UNIVERSITY



**September 1, 2012**

For a healthier community and cleaner  
environment, the University of Oregon  
will be smoke and tobacco free



**Ready to Quit Tobacco?**

Visit [tobaccofree.uoregon.edu](http://tobaccofree.uoregon.edu) for free and low cost resources

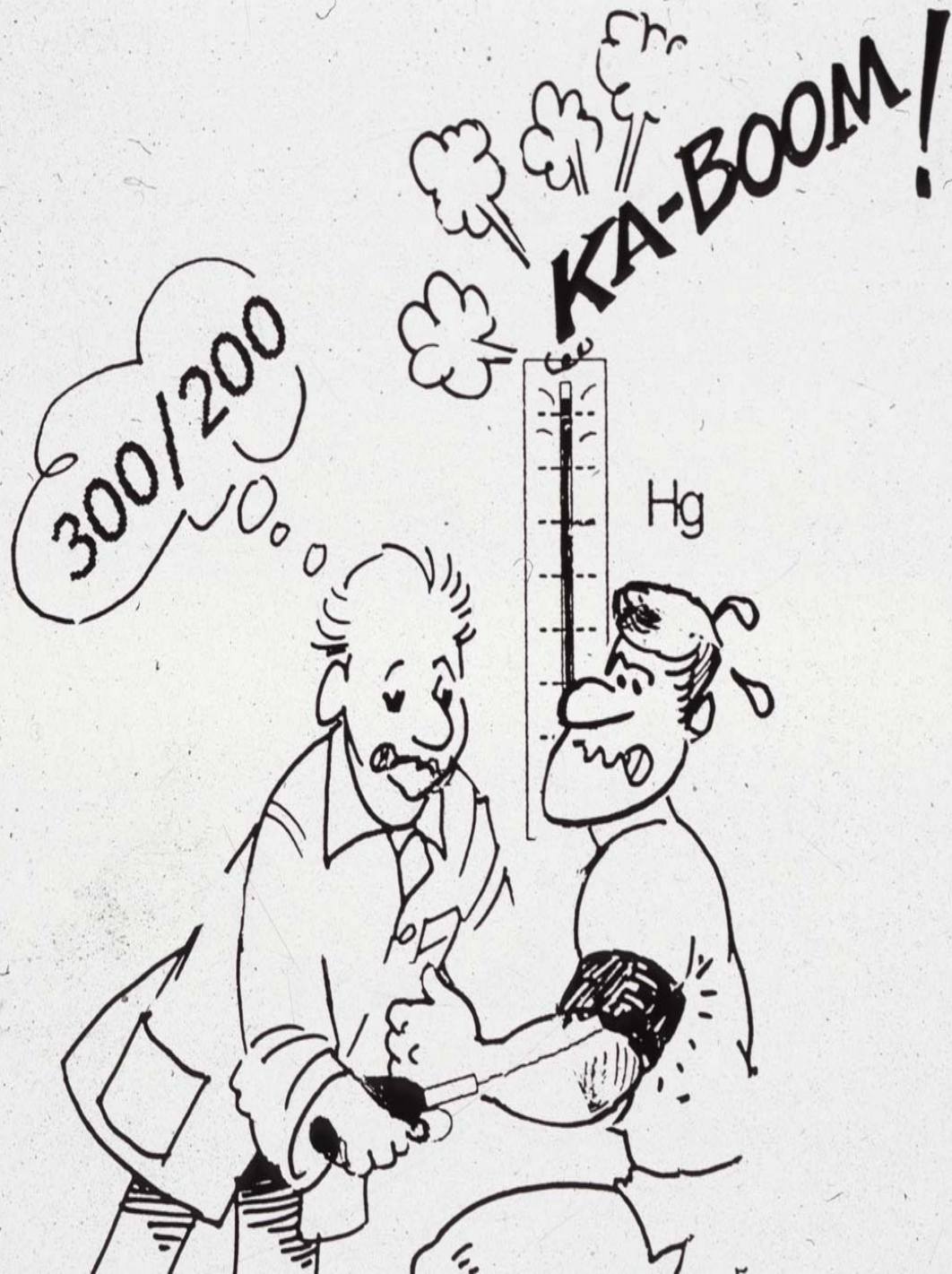


UNIVERSITY OF OREGON

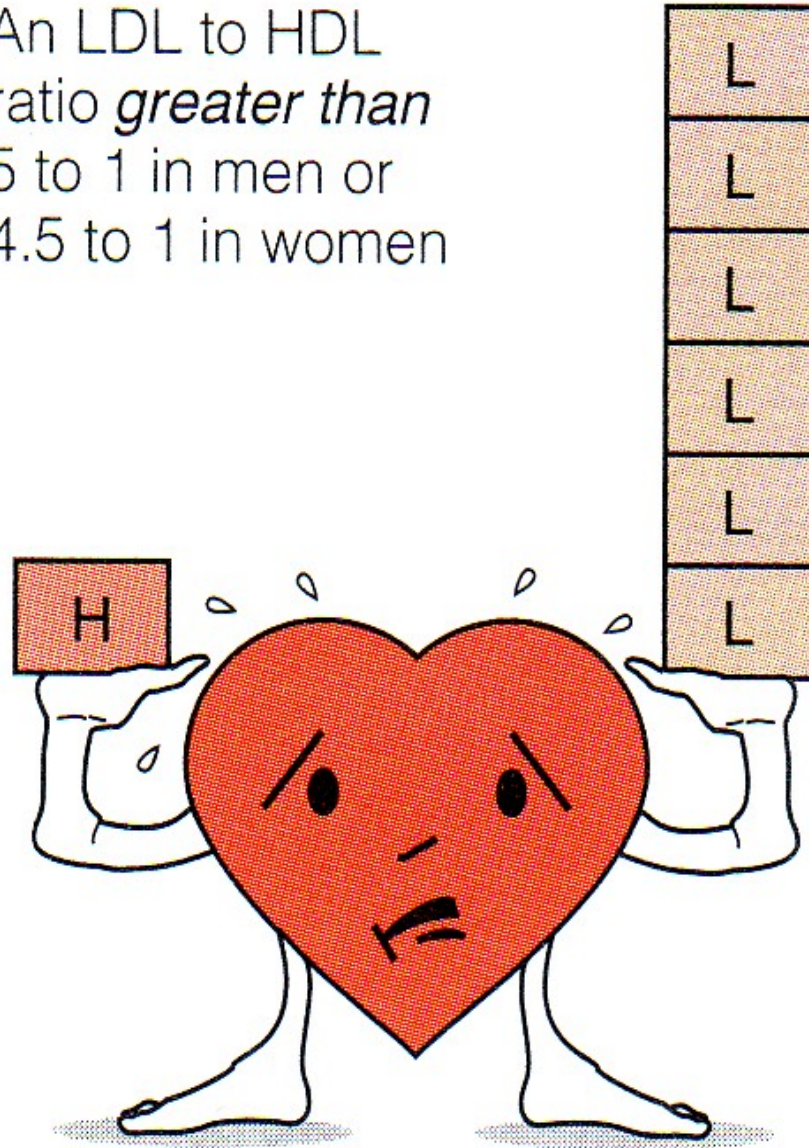
[tobaccofree.uoregon.edu](http://tobaccofree.uoregon.edu)



For a healthier community and cleaner  
environment, the University of Oregon  
is smoke and tobacco-free.

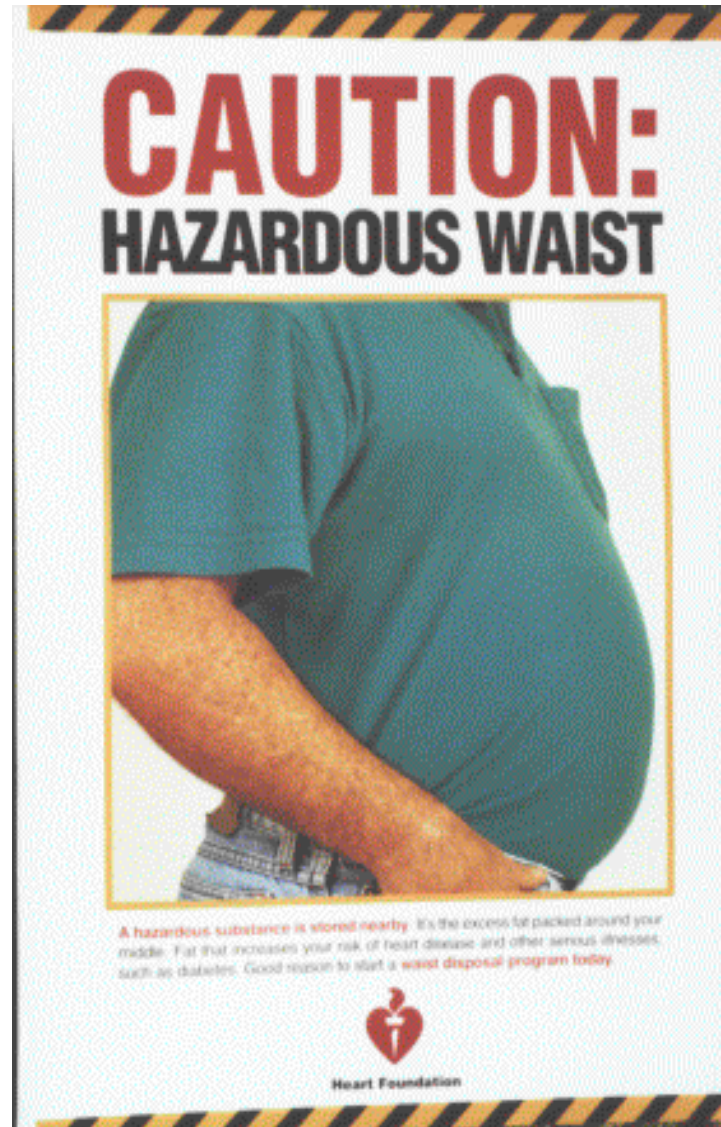


An LDL to HDL  
ratio *greater than*  
5 to 1 in men or  
4.5 to 1 in women




Increased risk of  
heart disease

Those with *apple type* of obesity predisposed to CVD!



**CAUTION:  
HAZARDOUS WAIST**

A hazardous substance is stored nearby. It's the excess fat packed around your middle. Fat that increases your risk of heart disease and other serious illnesses, such as diabetes. Good reason to start a **waist disposal program today.**

  
Heart Foundation



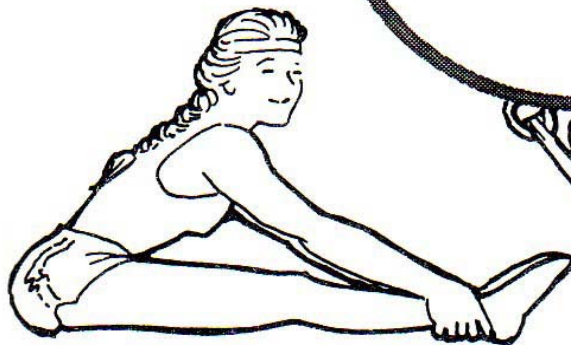
**Cardiorespiratory  
Endurance**



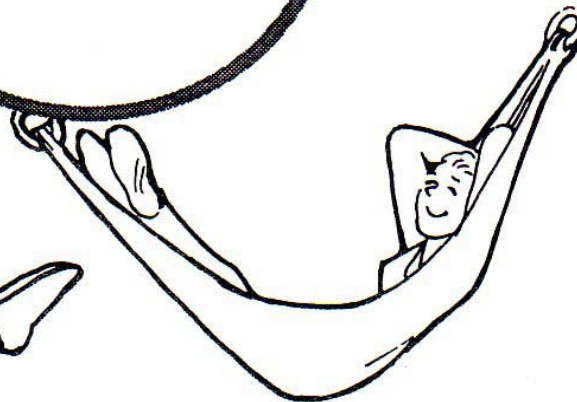
**Muscular  
Strength/Endurance**



**HEALTH-RELATED  
FITNESS**



**Flexibility**



**Neuromuscular Relaxation**







# Healthy Oils to Minimize Atherosclerosis HAPOC?

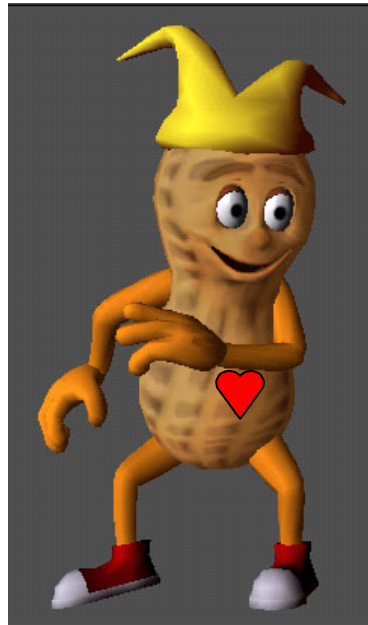
# H



# A



# P



# O



# C

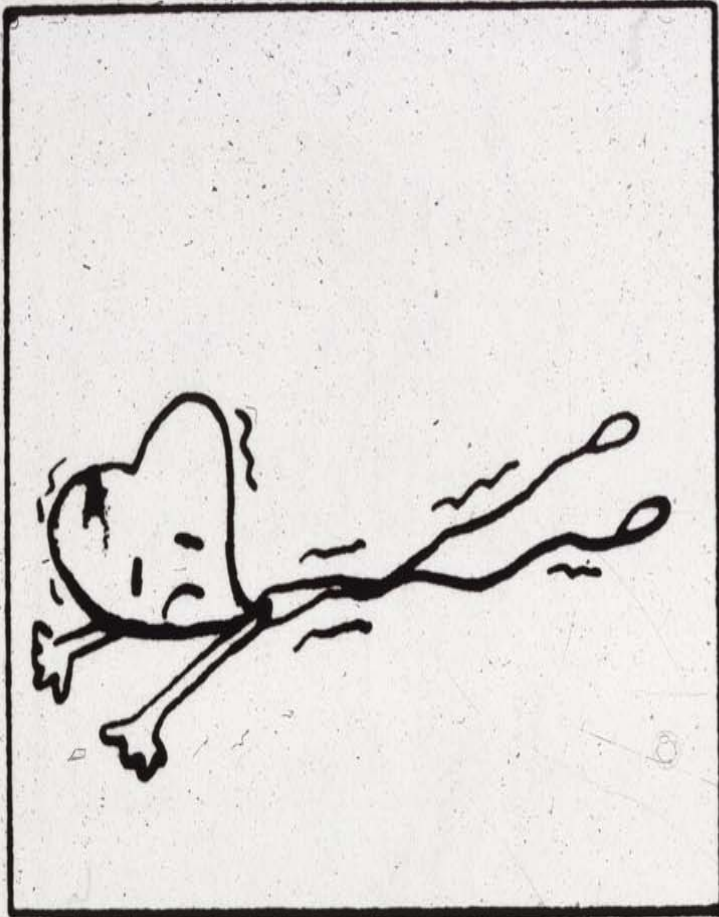


***Olive Oil Loves Olive Oil & has  
some heartfelt advise for Popeye!!***

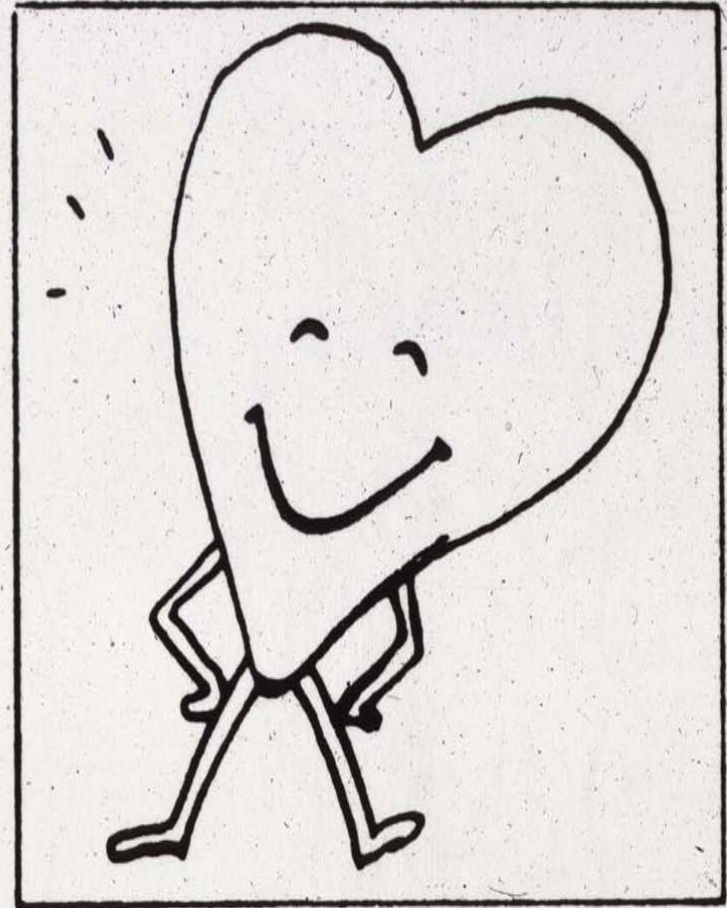


Yes for the  
spinach! — but get  
rid of the pipe!!



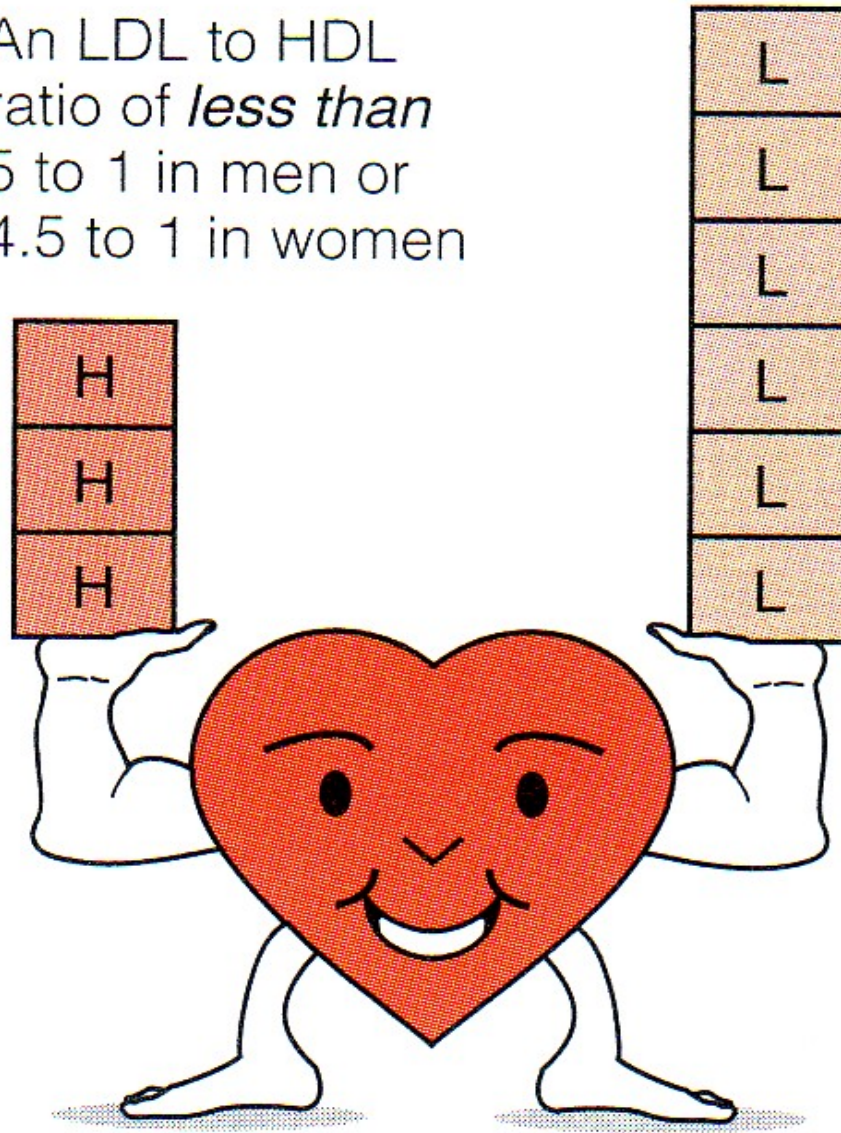


**Before**



**After**

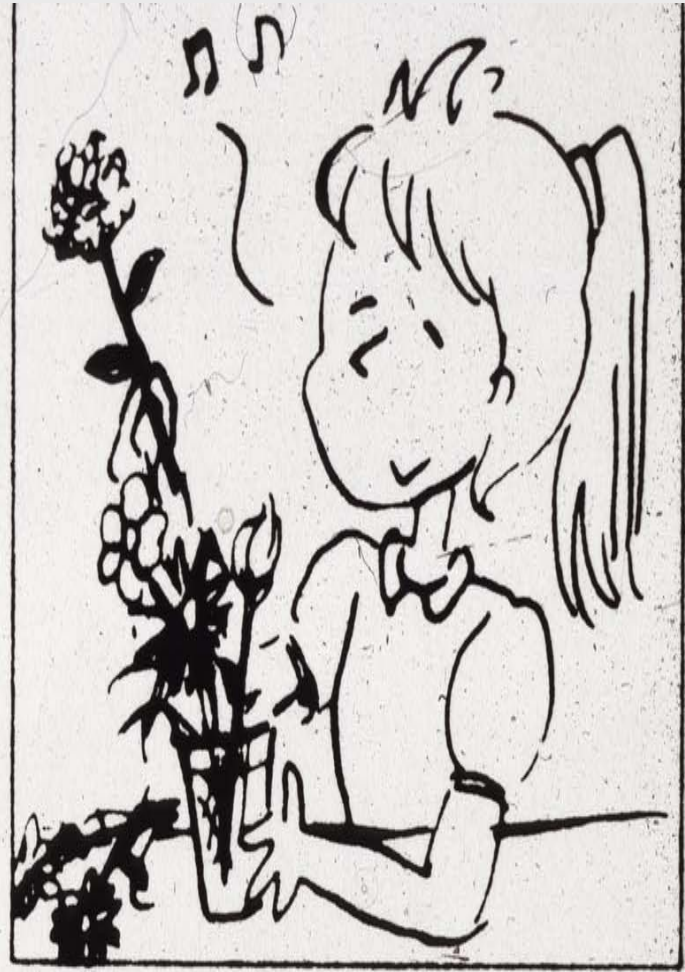
An LDL to HDL  
ratio of *less than*  
5 to 1 in men or  
4.5 to 1 in women



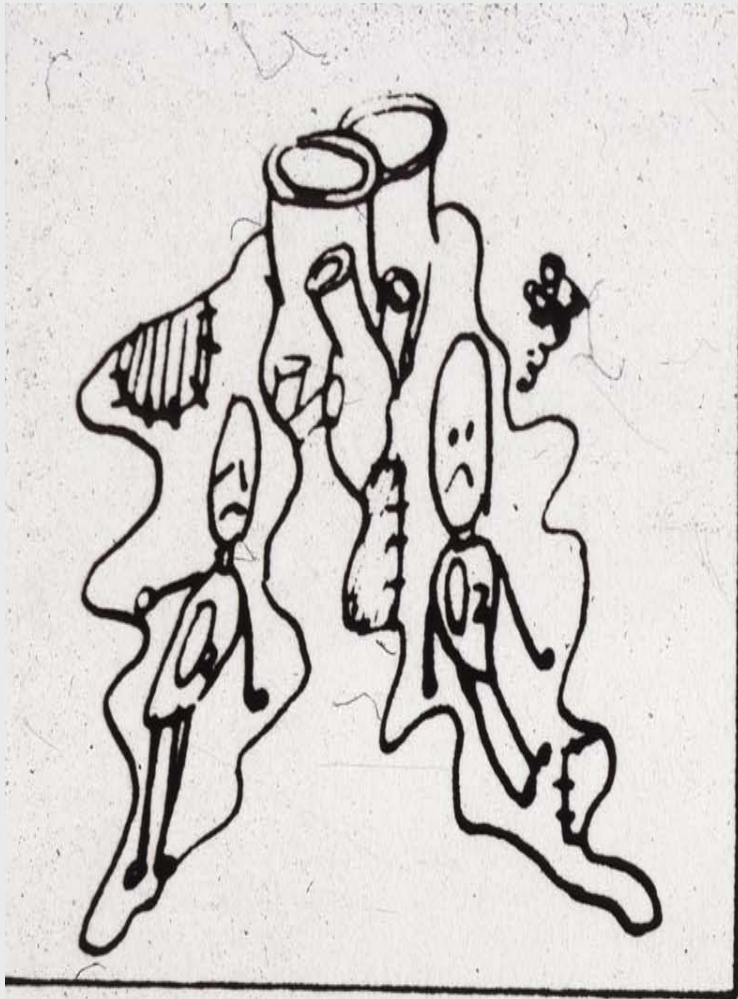
Reduced risk of  
heart disease



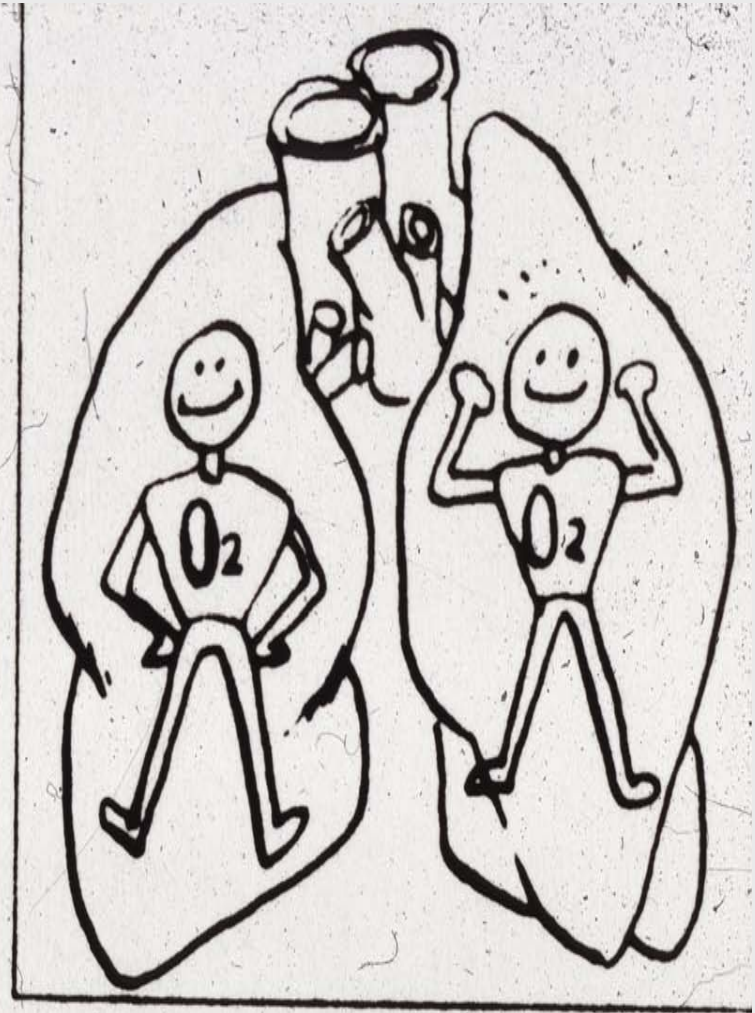
Before



After

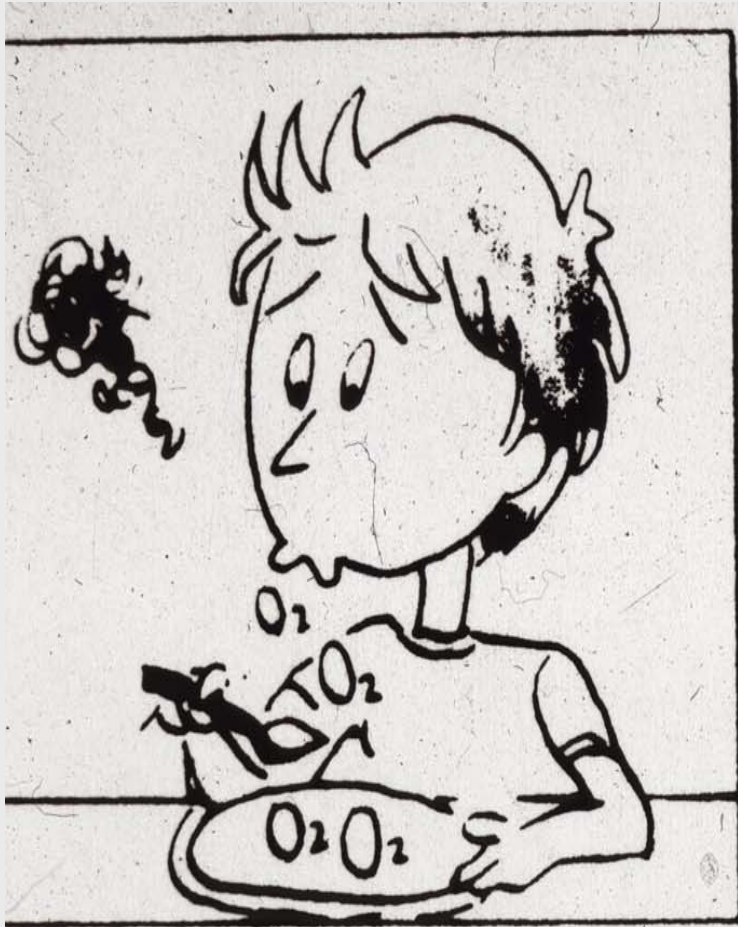


**Before**



**After**

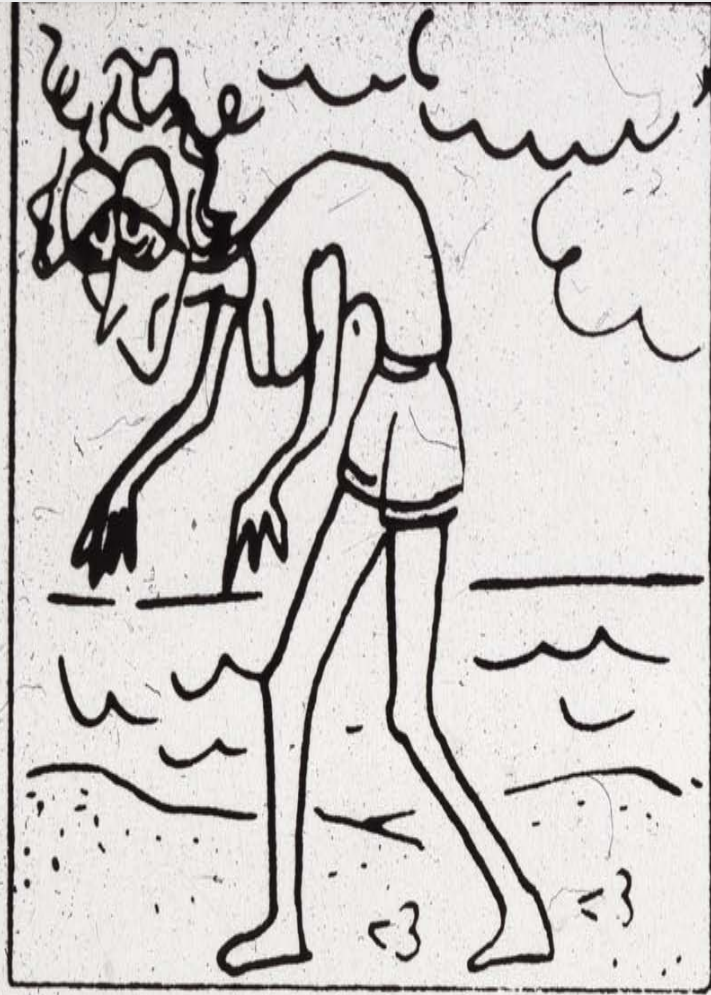




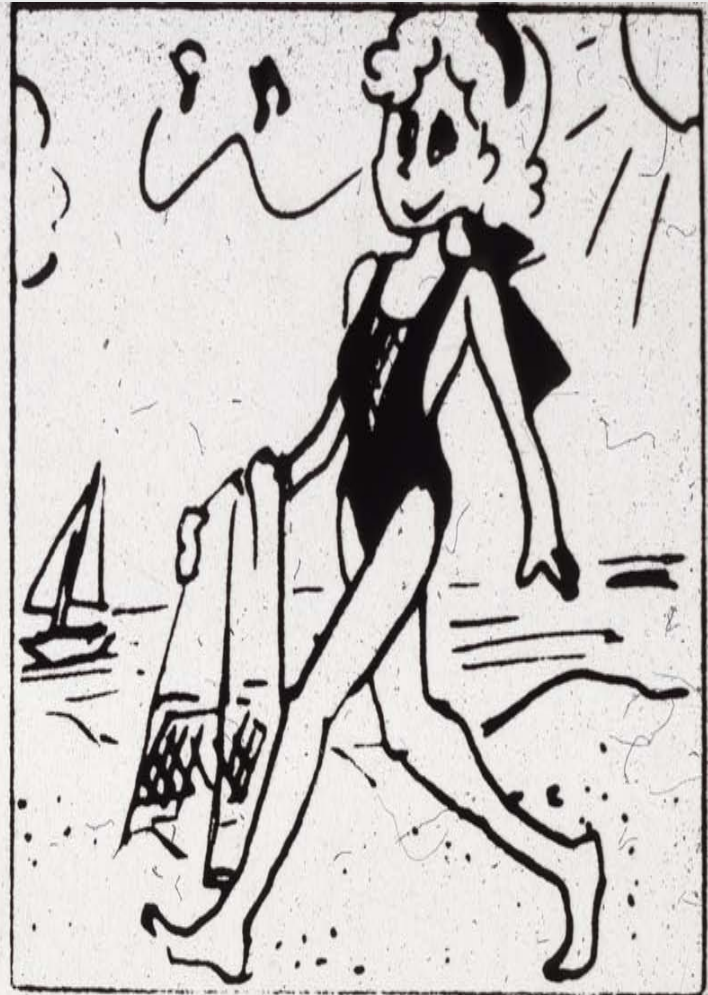
Before



After



**Before**



**After**