

**DIETARY GUIDELINES
SODIUM & POTASSIUM
TOO MUCH & TOO LITTLE**

SODIUM & POTASSIUM: WHAT THEY DO

- Minerals
- Potassium: keeps heart rhythm normal
- Sodium & potassium:
 - Control blood acidity
 - Control- amount H₂O in body
 - Important- nerve impulses & muscle contraction

TOO MUCH SALT (SODIUM)

- ↑ Blood pressure
- ↑ Heart attack (#1 killer)
- ↑ Stroke (#3 killer)
- ↑ Heart failure
- ↑ Kidney Disease

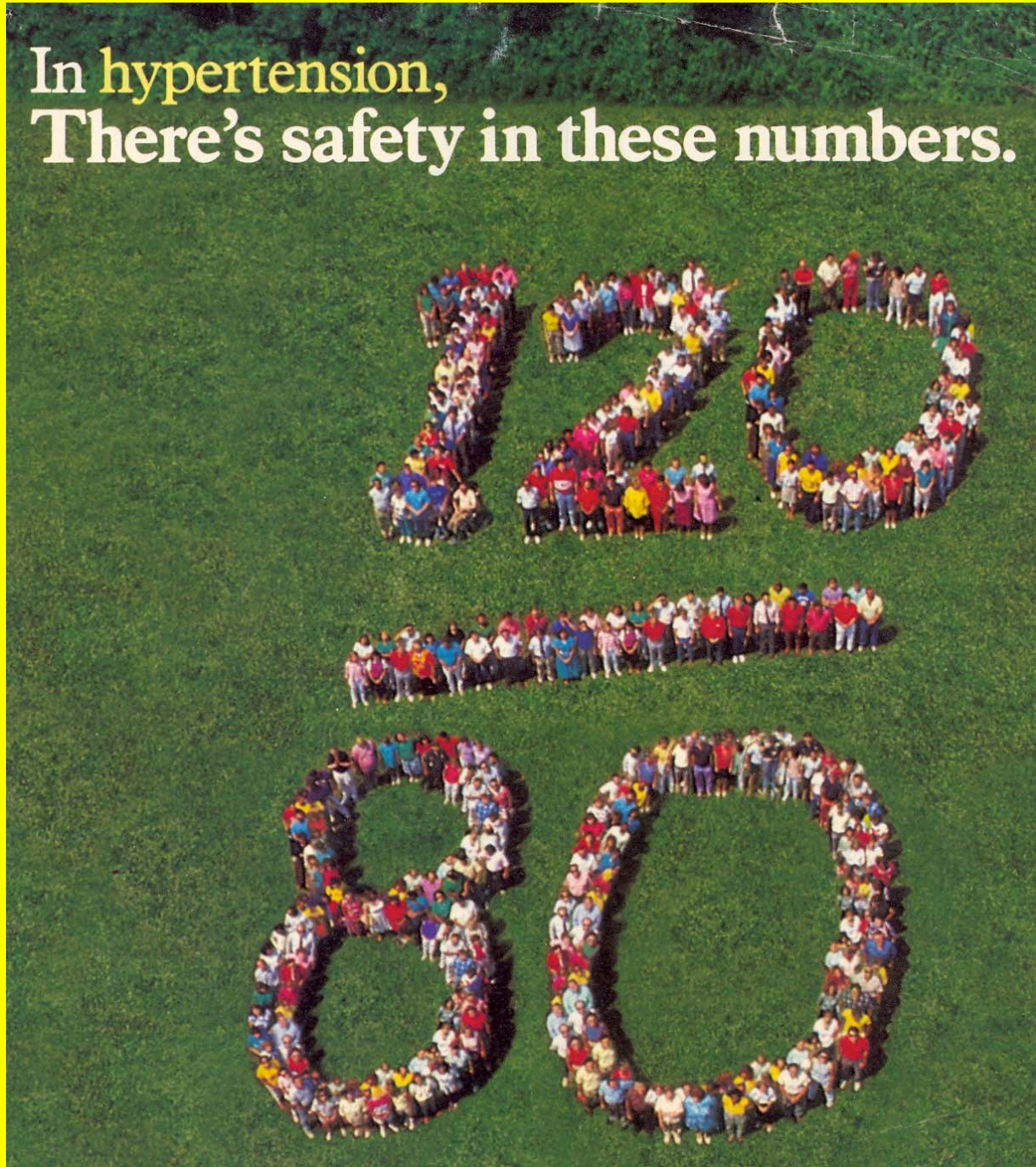
Know these numbers

	<u>Systolic/Diastolic</u>
Normal	120/80
Pre-hypertension	121-139/81-89
Hypertension	140/90 or >

Systolic: heart pumping

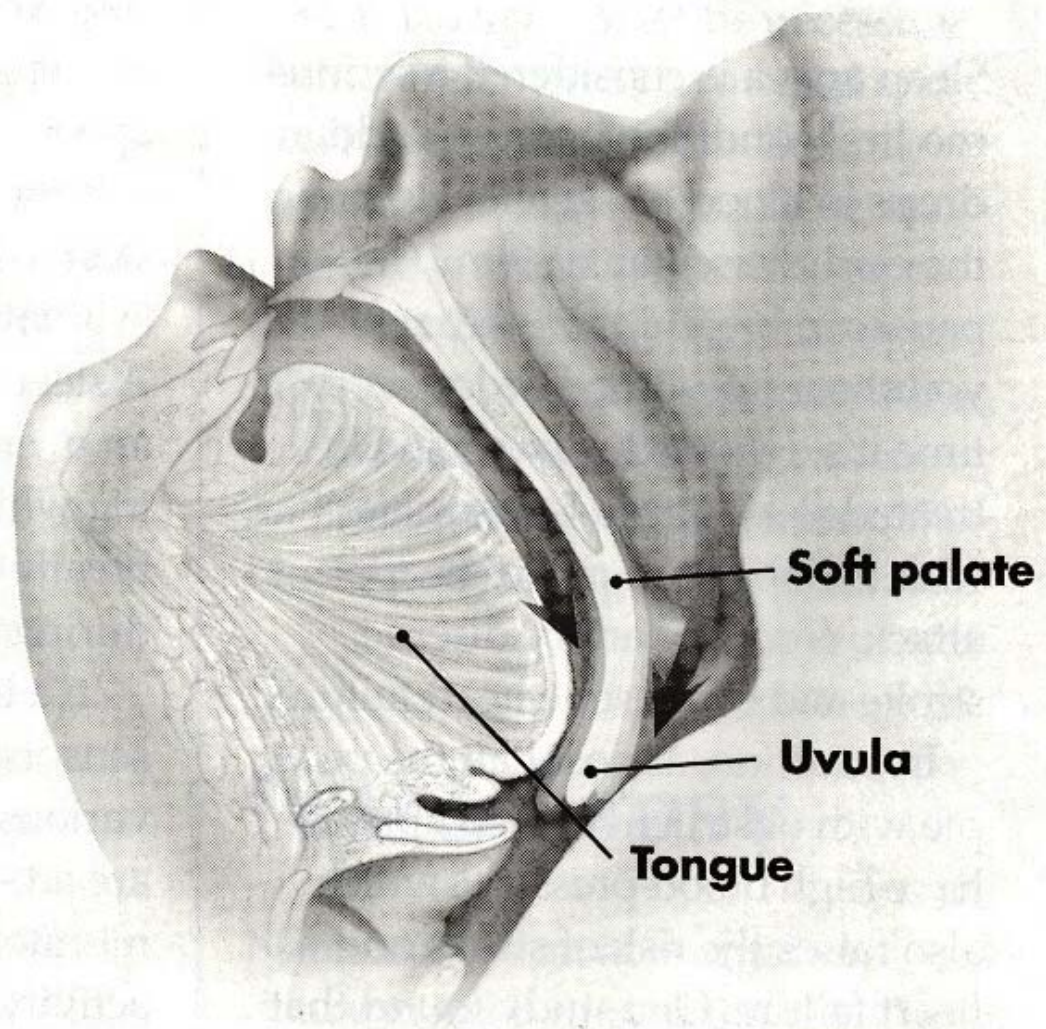
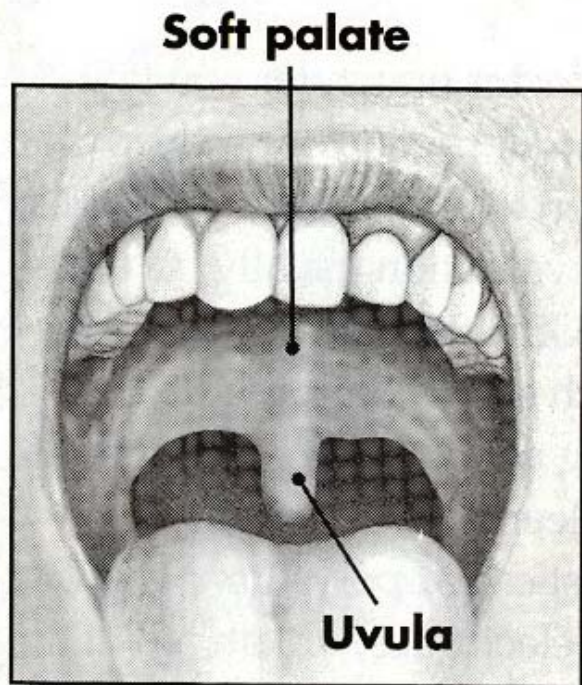
Diastolic: heart relaxing

In hypertension,
There's safety in these numbers.



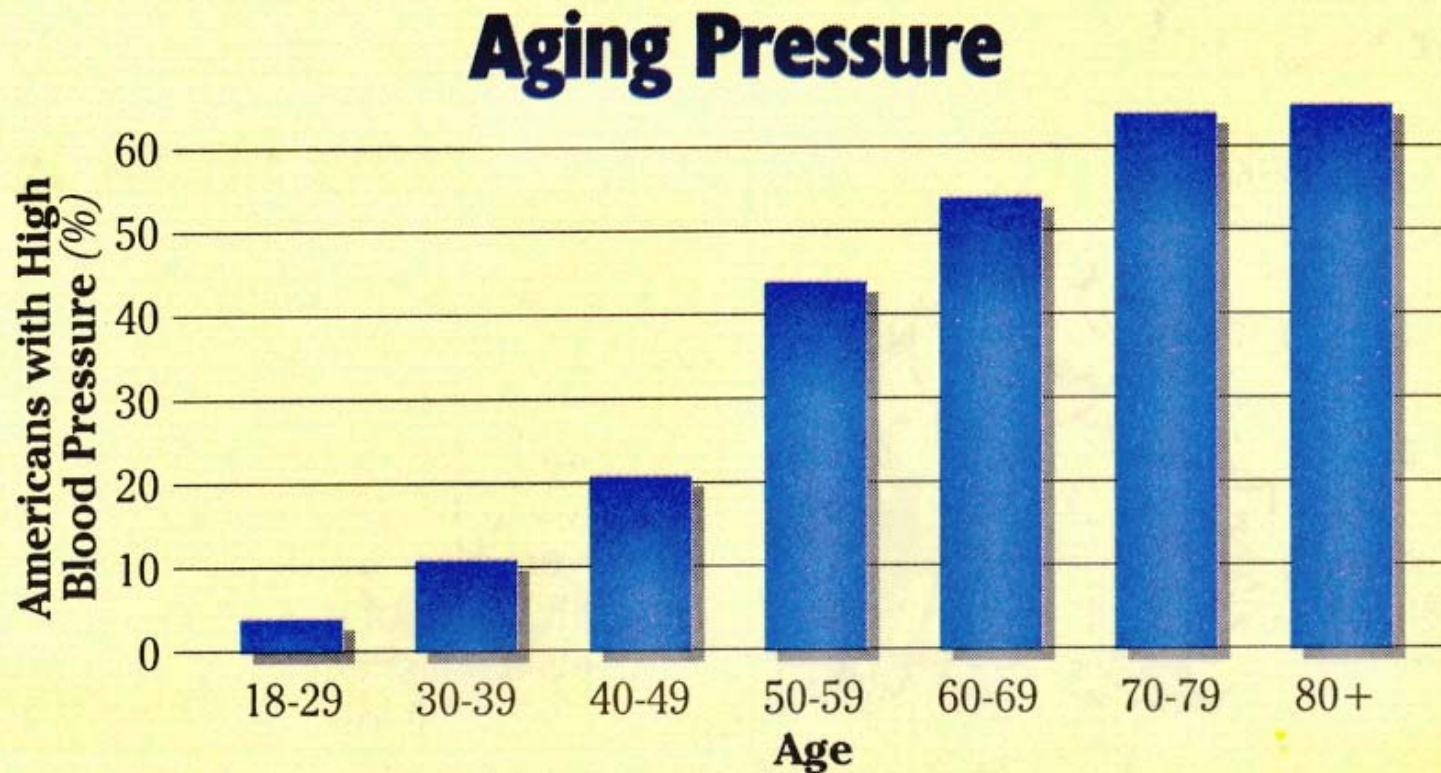
High Blood Pressure= Hypertension

- 50 million Americans
- **“silent killer”**
- 90% adults: hypertension with **age**
- ↑ Children/teens
- ↑ Black Americans
- Obesity, Fast foods, No exercise
- ↑ Alcohol
- Sleep Apnea (breathing pause)



In obstructive sleep apnea, the muscles that normally keep your airway open relax and sag during sleep, causing your tongue, tonsils, soft palate or uvula to repeatedly block your breathing.

Blood Pressure & Age



If you don't have high blood pressure now, don't assume you never will. The risk goes up sharply as you age.

Source: *Archives of Internal Medicine* 153: 186, 1993.

Hypertension

- Control of hypertension is not good in Americans despite good medications (Dr. Chobanian, BU)
- 28% Americans unaware- HBP
- 39%: no therapy for HBP
- 65%: blood pressure not well controlled (below 140/90)

Children, TV, Blood Pressure

2009 Michigan

State University Study

↑ TV watching:
children

↑ Blood pressure
Even if children
Thin & get Exercise



Rigid vessel wall

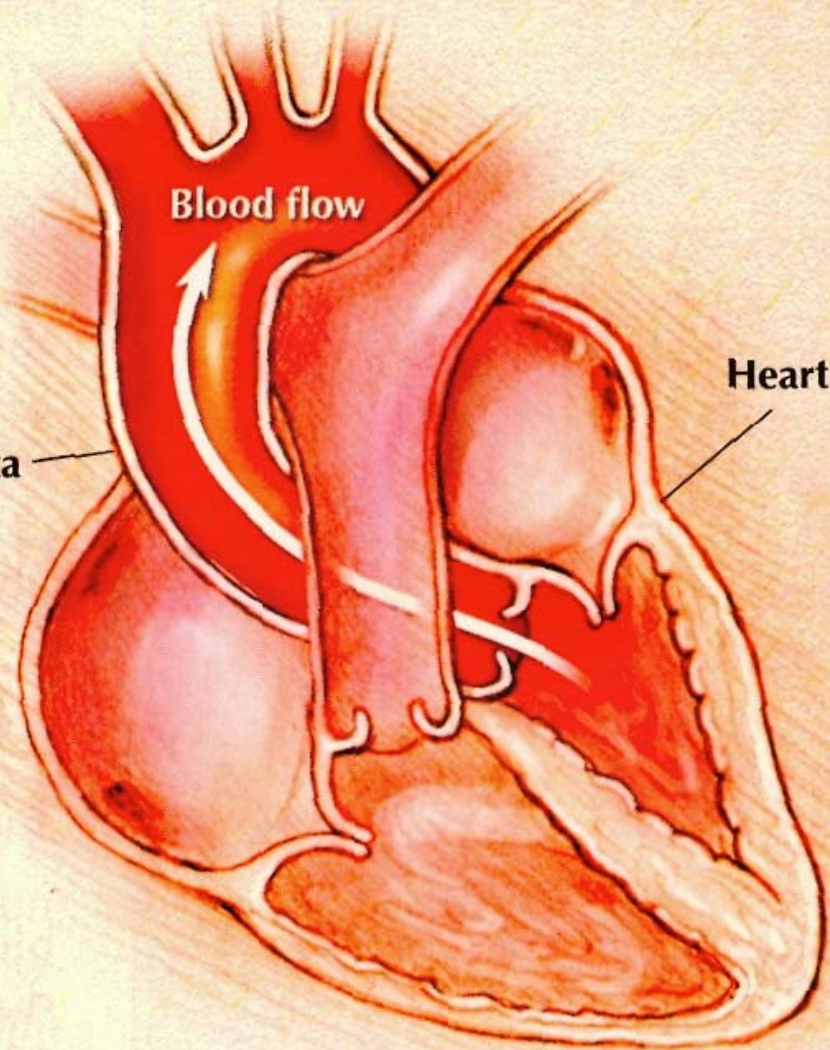


Plaques

Aorta

Blood flow

Heart



As arteries near your heart become more rigid and less able to expand, more force from each heartbeat is passed along to the rest of your blood vessels. This can raise your systolic blood pressure.

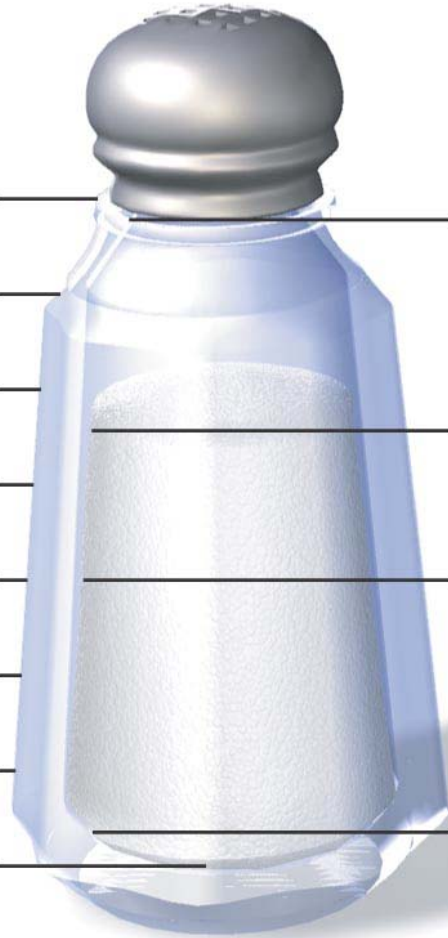
Sodium in diet: what you need

- Adequate intake: **1500** milligrams/day
- Above **1500**: not needed- unless: strenuous work/exercise



Milligrams of Sodium

3,500
3,000
2,500
2,000
1,500
1,000
500
0



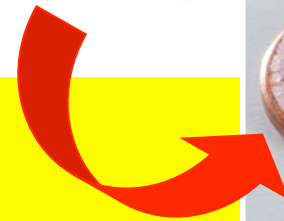
**American adult
daily consumption
($>3,400$ mg)**

**Adult upper level
(2,300 mg)**

**Adult
recommended
daily (1,500 mg)**

**Adult needed
daily (180 mg)**

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Where does sodium come from?

12%: naturally- foods

11%: you- salt shaker

77%: **processed foods-**
added by
companies

Salt in supermarket foods

	<u>mg sodium</u>
Breads	95-210
Frozen pizza	450-1200
Frozen veggies	2-160
Salad dressing	110-505
Salsa	150-240
Tomato soup	700-1260

Salt in supermarket foods

	<u>mg sodium</u>
Tomato juice	340-1040
Potato chips	120-180
Tortilla chips	105-160
Pretzels	290-560

Soup Wars: Theory- ↓ Economy: attack your opponents harder. Aggressive ADS: attacking competitor by name

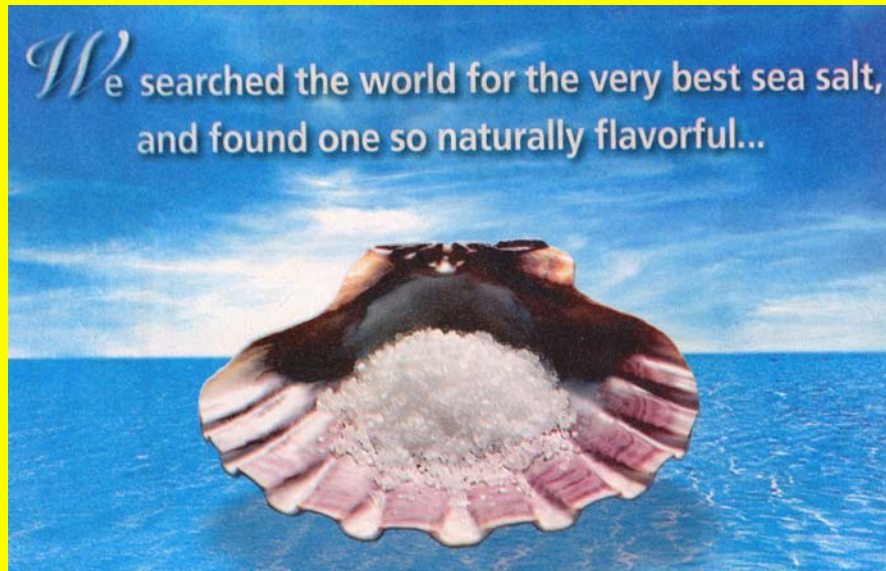
690 mg Sodium



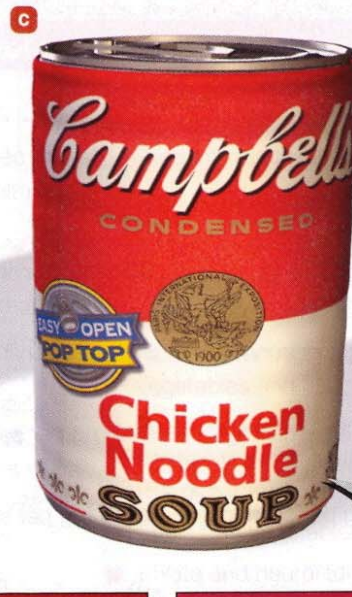
480 mg Sodium



Campbell & Sea Salt



Campbell's Tomato Soup: **410-480**
mg Sodium



DIRECTIONS:
DO NOT ADD WATER

MICROWAVE: HEAT, COVERED, IN MICROWAVABLE BOWL ON HIGH 1 1/2 MIN. CAREFUL, LEAVE IN MICROWAVE 1 MIN., THEN STIR.
STOVE: HEAT, STIRRING OCCASIONALLY.

RECOMMEND USE BY DATE ON CAN END.
CAUTION: METAL EDGES ARE SHARP.
PROMPTLY REFRIGERATE UNUSED SOUP IN SEPARATE CONTAINER.

Nutrition Facts	Amount/serving	%DV*	Amount/serving	%DV*
	Total Fat 4.5g	7%	Total Carb. 14g	5%
Serv. Size 1 container	Sat. Fat 1.5g	8%	Fiber 2g	8%
Calories 130	Trans Fat 0g		Sugars 3g	
	Fat Cal. 40	Cholest. 25mg	8%	Protein 9g
	Sodium 120mg	5%		

*Percent Daily Values (DV) are based on a 2,000 calorie diet.
Vitamin A 25% • Vitamin C 0% • Calcium 2% • Iron 4%

Satisfaction guaranteed. If you have questions or comments, please call 1-800-257-8443. Please have code and date information from the can end available.

Visit our website at www.campbellsoup.com

0618-17X

0 51000 00618 9

QUICK & EASY DIRECTIONS
MIX SOUP + 1 CAN WATER

MICROWAVE: HEAT, COVERED, IN MICROWAVABLE BOWL ON HIGH 2 1/2 TO 3 MINUTES. CAREFUL, LEAVE IN MICROWAVE 1 MINUTE, THEN STIR.
STOVE: HEAT, STIRRING OCCASIONALLY.

CAUTION: METAL EDGES ARE SHARP.
RECOMMEND USE BY DATE ON CAN END.
PROMPTLY REFRIGERATE ANY UNUSED SOUP IN SEPARATE CONTAINER.

Nutrition Facts	Amount/serving	%DV*	Amount/serving	%DV*
	Total Fat 2g	3%	Sodium 450mg	19%
Serv. Size 1/2 cup (120mL) condensed soup	Sat. Fat 0.5g	3%	Potassium 240mg	7%
Servings about 2.5	Trans Fat 0g		Total Carb. 8g	3%
Calories 60	Polyunsat. Fat 0.5g		Fiber 1g	4%
	Fat Cal. 20	Monounsat. Fat 0.5g	Sugars 1g	
	Cholest. 10mg	3%	Protein 3g	

*Percent Daily Values (DV) are based on a 2,000 calorie diet.
Vitamin A 15% • Vitamin C 0% • Calcium 0% • Iron 0%

Satisfaction guaranteed. For questions or comments, please call 1-800-257-8443. Please have code and date information on can end available.
*This product contains 450 mg of sodium versus 890 mg for our comparable condensed soup.
5897-505-2X

American Heart Association
Meets American Heart Association food criteria for saturated fat and cholesterol for healthy people over age 2.
While many factors affect heart disease, diets low in saturated fat and cholesterol may reduce the risk of this disease.

0 51000 05897 3

QUICK & EASY DIRECTIONS
MIX SOUP + 1 CAN WATER

MICROWAVE: HEAT, COVERED, IN MICROWAVABLE BOWL ON HIGH ABOUT 3 MIN. CAREFUL, LEAVE IN MICROWAVE 1 MIN., THEN STIR.
STOVE: HEAT, STIRRING OCCASIONALLY.

PROMPTLY REFRIGERATE ANY UNUSED PORTION IN SEPARATE CONTAINER.
RECOMMEND USE BY DATE ON CAN END.
STORE UNOPENED CAN AT ROOM TEMPERATURE.

Nutrition Facts	Amount/serving	%DV*	Amount/serving	%DV*
	Total Fat 1.5g	2%	Total Carb. 8g	3%
Serv. Size 1/2 cup (120mL) condensed soup	Sat. Fat 0.5g	3%	Fiber Less than 1g	4%
Servings about 2.5	Trans Fat 0g		Sugars 1g	
Calories 60	Cholest. 15mg	5%	Protein 3g	
	Fat Cal. 15	Sodium 890mg	37%	

*Percent Daily Values (DV) are based on a 2,000 calorie diet.
Vitamin A 4% • Vitamin C 0% • Calcium 0% • Iron 2%

Satisfaction guaranteed. For questions or comments, please call 1-800-257-8443. Please have code and date information on can end available.

For more information, visit www.campbellsoup.com

1251-406-12

0 51000 01251 7

Dietary Guidelines: **2300**
milligrams/day

Special Populations:

1500 milligrams/day

- People with hypertension
- **At risk:** Black Americans, middle-aged/older adults
- Salt-sensitive people

Potassium & Blood Pressure

Potassium: **Anti-salt**

- ↓ Blood pressure
- ↓ Risk- stroke
- ↓ Kidney stones
- ↓ Bone loss



Kidney stone

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Recommendation: **4,700** mg/day

Average American: 1/2 this amount

↑ Kidney stones US children (2008)

Oxalates (food)
binds to
calcium → stone

2 risk factors:

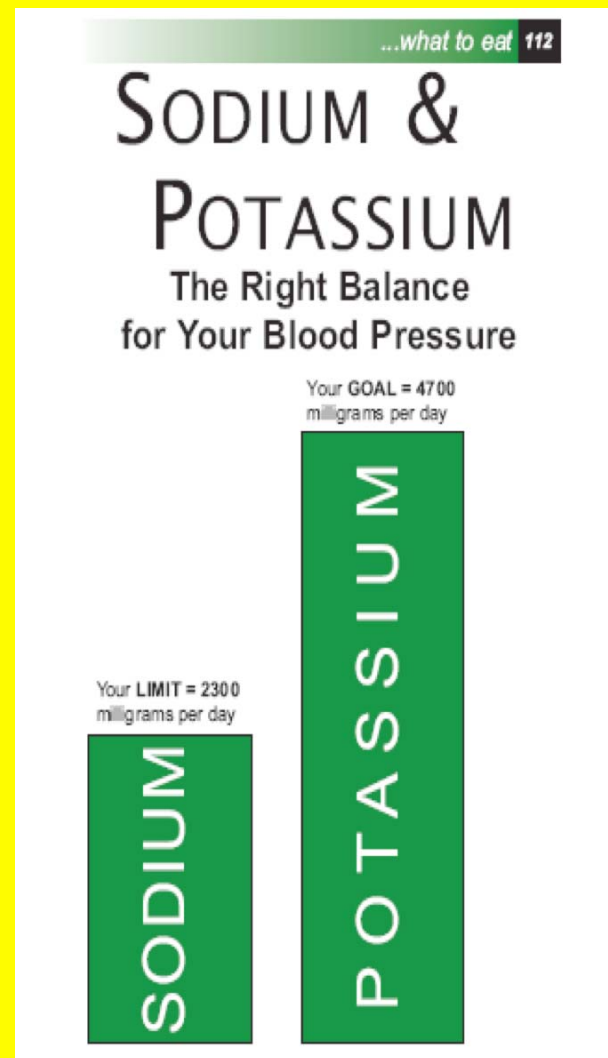
- 1) not enough drinking of fluids
- 2) too much **salt**



Tessa Cesario

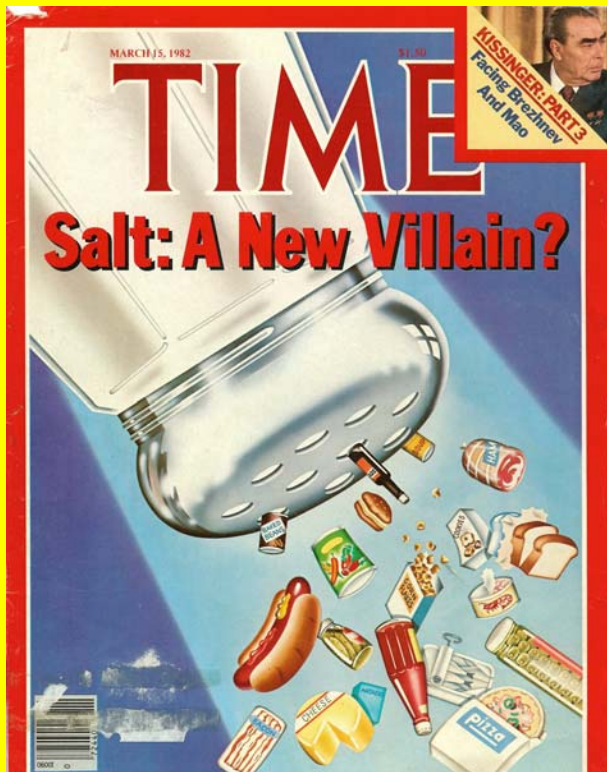
11 years old

What's important: balance of sodium & potassium in diet



Simple way: better balance

↓ Added salt/processed foods



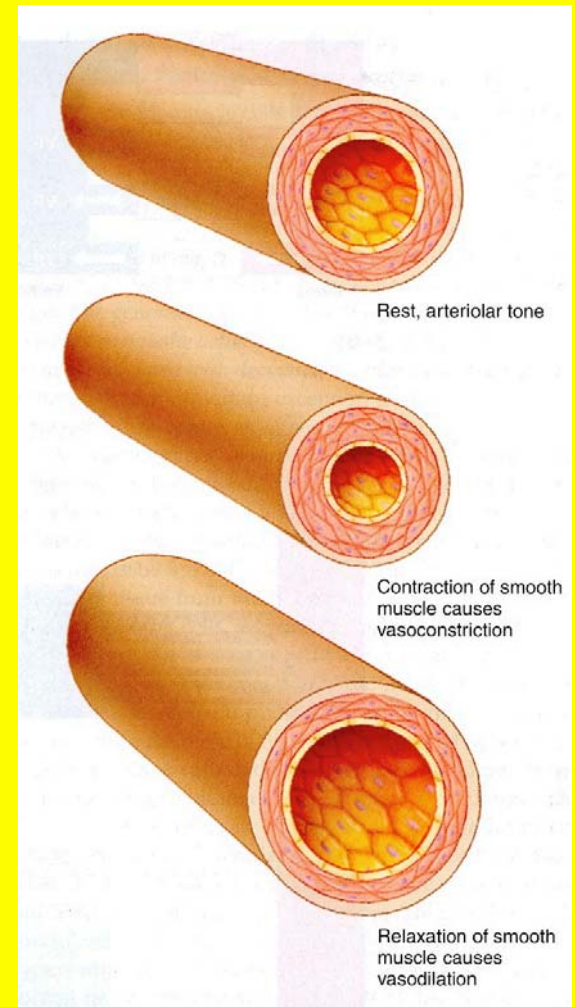
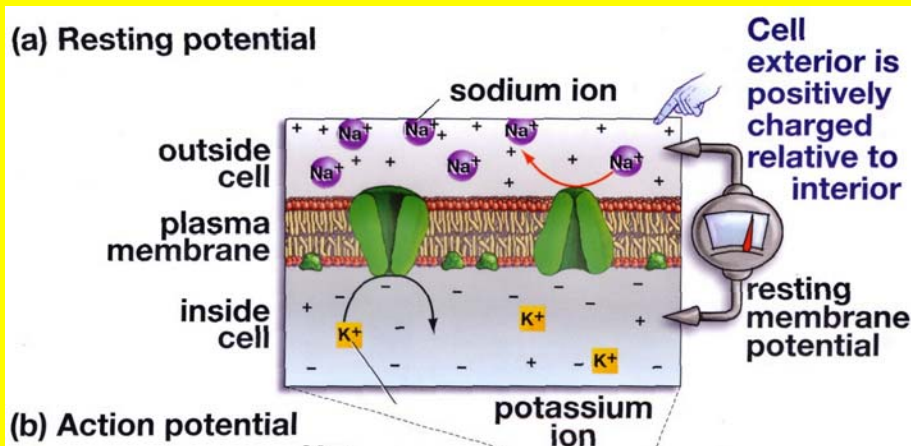
↑ Fruits & veggies
(low sodium, high

m)



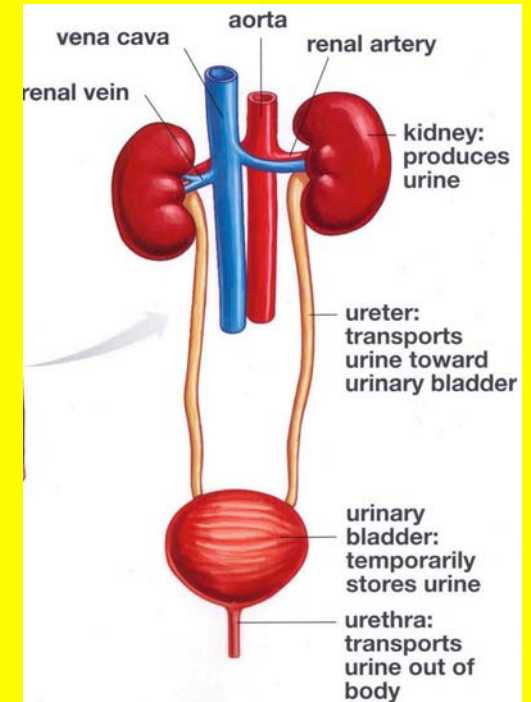
How sodium/potassium imbalance produces hypertension

1. Arteries: direct effect:
“vascular resistance”
contracted not relaxed



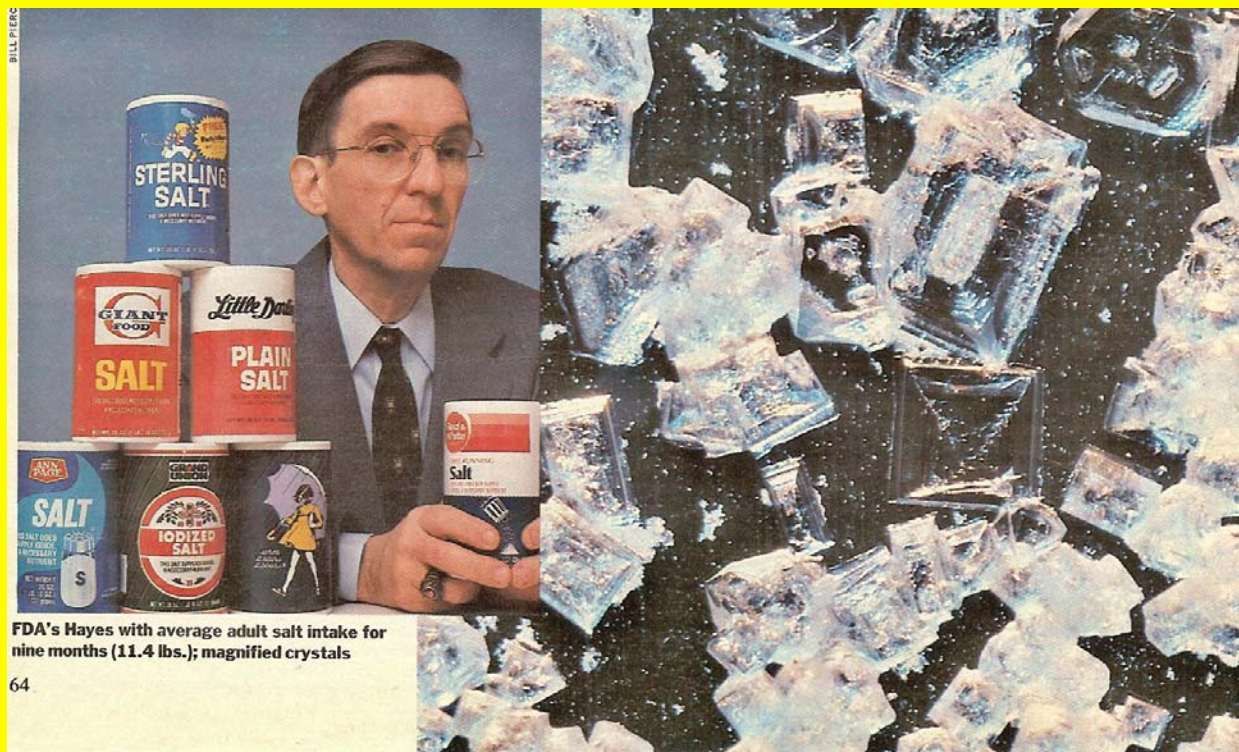
2. Effect on **kidneys**

- **Our kidneys evolved: conserve sodium & excrete potassium (homeostasis)**
- **Prehistoric diet**



Today's diet: **overloads** kidney's
with salt (sodium)

Our kidney's have not adapted to
"modern" diet

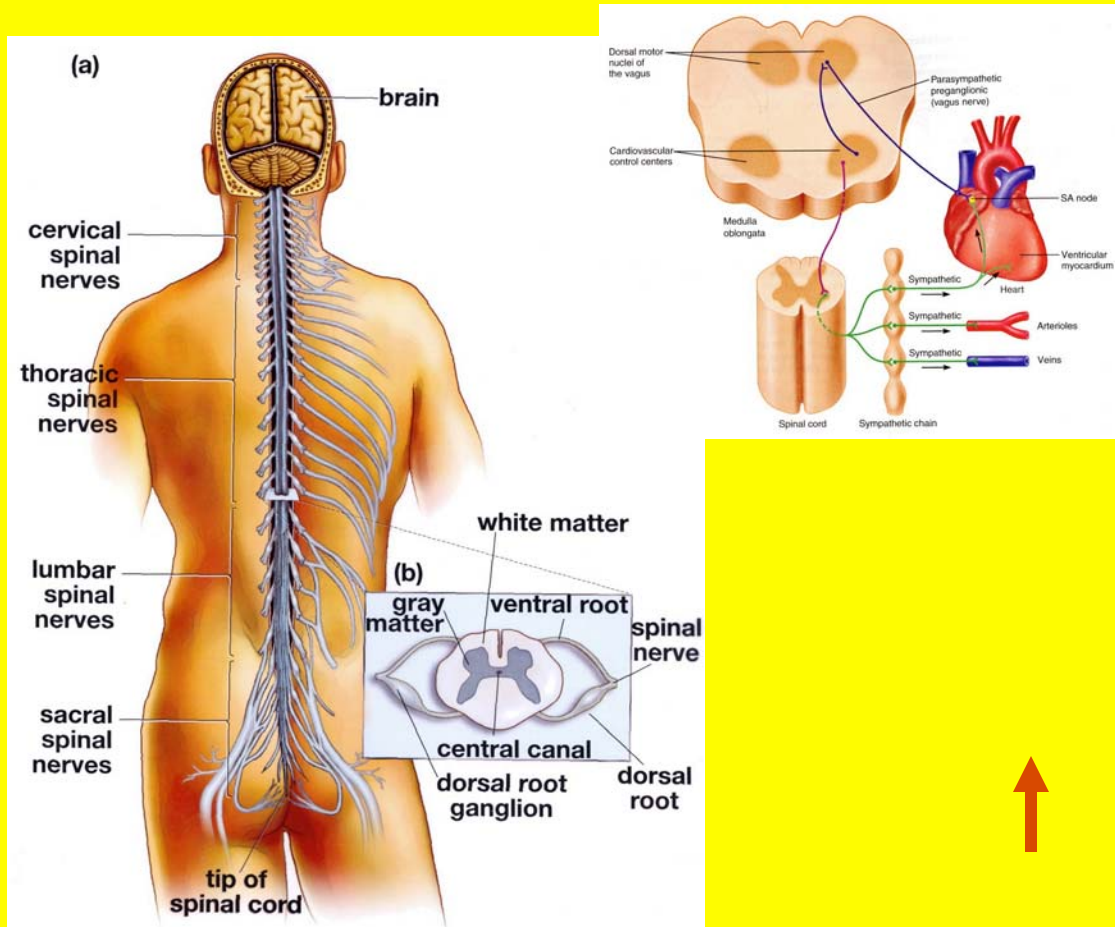


3. Sodium/potassium in cerebrospinal fluid: affects brain → impulses

↓
blood vessels

↓
vasoconstriction

↑ blood pressure

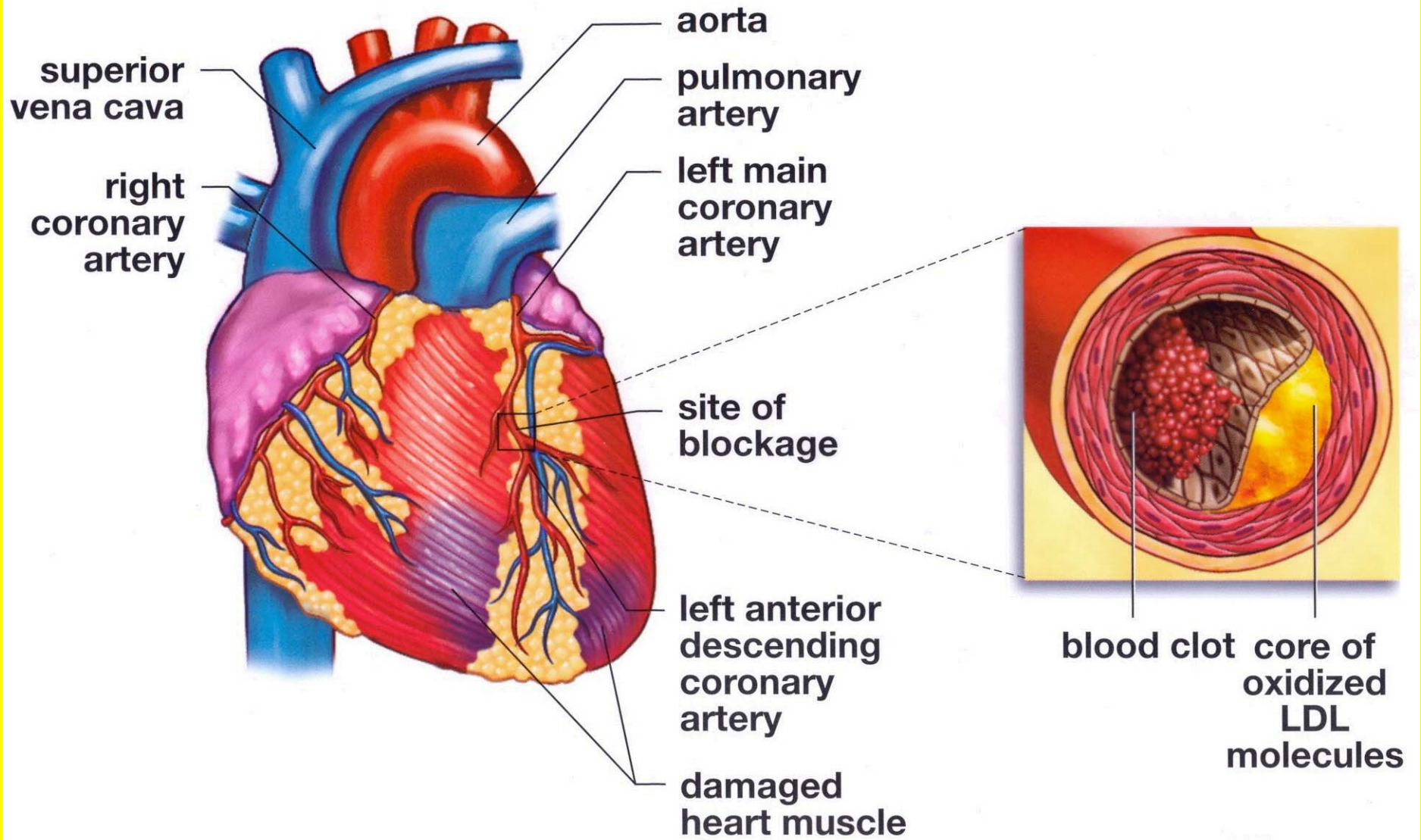


Genetics & high blood pressure

- Several genes: affect arteries & kidneys: produce hypertension
- Made worse by sodium/potassium imbalance in diet

Hypertension, heart attacks, stroke

- Blood pressure: **shearing** affect (stress)- artery lining
- Drives **cholesterol** into arteries
- Cholesterol deposits- build up
- Blockage → **heart attack**
→ **stroke**



High blood pressure water pill: **diuretic**

- Loss potassium → urine
- Replace with OJ, bananas, potassium supplement
- Potassium **helps** diuretic lower Blood Pressure
- ↑ potassium diet/supplement: people reduce/stop B.P. pills



Natural way to control blood pressure

- Return to caveman diet
- Dietary Approaches to Stop Hypertension (**DASH**) Eating Plan
- National Heart, Lung & Blood Institute

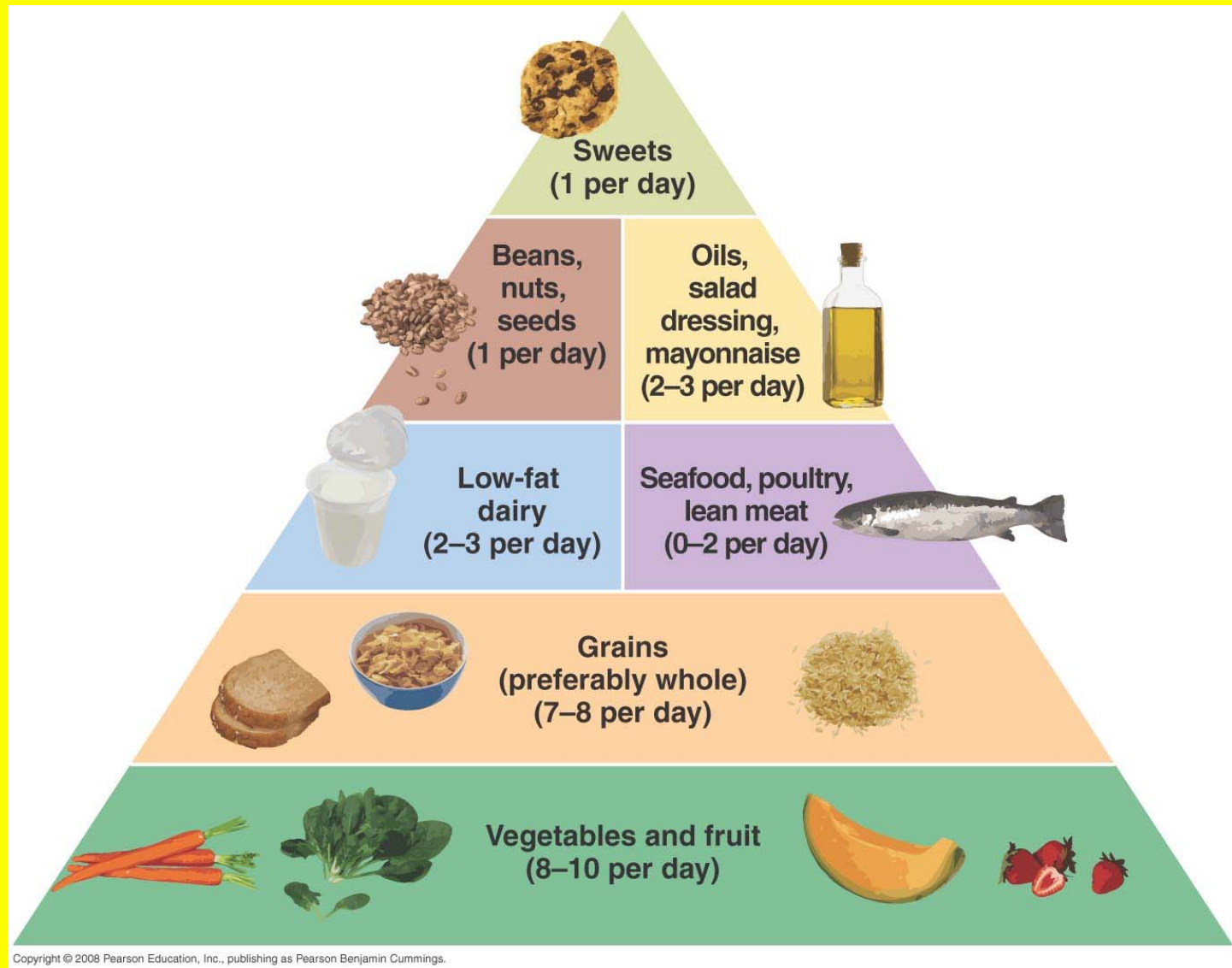


DASH

- ↑ Fruits & veggies
- Low fat milk (calcium) products
- Eat more: poultry, fish, nuts
- Eat less: red meat, sugar in processed foods/drink

**If all Americans ate DASH:
dramatic drop in heart
attacks/stroke**

DASH DIET



SALT HAPPENS.



FIGHT BACK.



Help control blood pressure with NEW Promise® SuperShots® as part of a potassium-rich, low-sodium diet

Because salt is hidden in lots of foods, these delicious fruit blends are a good source of potassium. Diets that provide potassium help flush sodium from your body. And diets containing foods that are good sources of potassium and low in sodium may reduce your risk of high blood pressure and stroke.

Promise® SuperShots®—a deliciously unique way to have more potassium in your life.

For more information on potassium benefits, go to WebMD.

Potassium benefits

WebMD

supershots

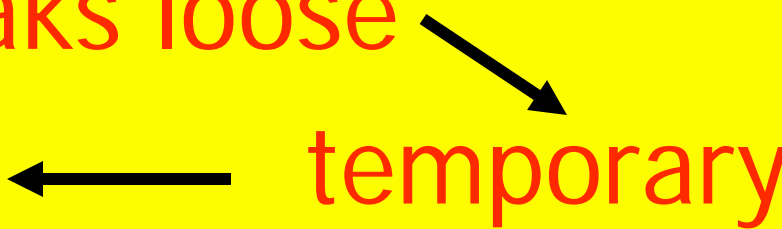
TIA's (Little Strokes)

- **Transient ischemic attacks**
- **Ischemia:** deficiency blood flow to organ
- Temporary ↓ blood to brain
- Few minutes- 24 hours
- Symptoms disappear

TIA symptoms

- Sudden weakness/numbness face/arm/leg (one side)
- Lack- coordination
- Vision loss/double vision
- Difficulty speaking/understanding
- Dizziness, loss balance, difficulty walking

Cause of TIA

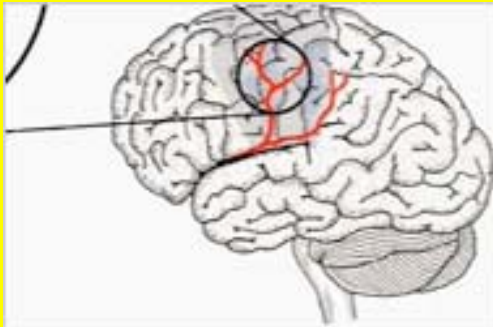
- Fatty deposits (**plaques**) narrow brain arteries (atherosclerosis)
 - Plaque piece breaks loose
plug brain artery ← temporary
- 
- A diagram illustrating the mechanism of a TIA. It shows the text 'plug brain artery' followed by a left-pointing arrow, and the word 'temporary' to its right. A right-pointing arrow connects 'temporary' to the left-pointing arrow, and another right-pointing arrow points from the word 'loose' in the line above to the right-pointing arrow.

WARNING: big stroke is on way

Get help **ASAP**

Stroke

- Often morning- during sleep
- Wake up: can't speak, paralyzed- one side



STROKE
STROKE
How to Avoid a Brain Attack
BY BONNIE LIEBMAN

In the first minute of a stroke, your brain loses an estimated 1.9 million cells—what you'd lose in three weeks of normal aging.

But the loss continues every minute the stroke is left untreated. If a stroke runs its usual 10-hour course, it can kill 1.2 billion nerve cells—what a normal brain loses over the course of 36 years.

That doesn't have to happen. "Stroke is a highly treatable disease, but unfortunately, the time in which physicians can effectively reverse a stroke is short," says UCLA neurologist Jeffrey Saver.

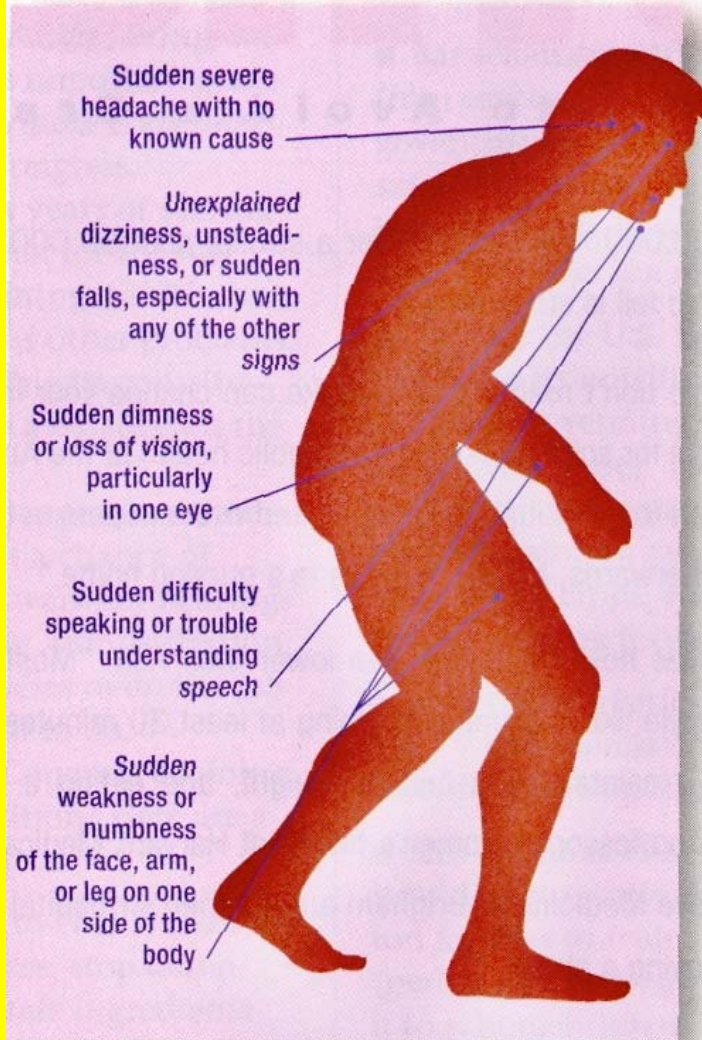
"Precious tissue is lost every second," he explains. "Patients need to get to the hospital at the first sign a stroke is occurring."

If they get there within three hours, doctors can use a clot-busting drug like tPA (tissue plasminogen activator) to curb the damage. But many victims wait, hoping the symptoms will disappear.

"Don't try to tough it out, and don't waste time trying to get in touch with your primary physician or a neurologist," says Saver, who calculated the brain cell losses. "You need emergency help."

Continued on page 3.

Signs of a Stroke



If you or someone else has one or more of these warning signs, don't wait.

Call 911 immediately, even if the signs go away.

Other, less common signs include double vision, drowsiness, nausea, or vomiting.

Adapted from *J. Amer. Med. Assoc.* 279:1324, 1998. ©1998, American Medical Association.

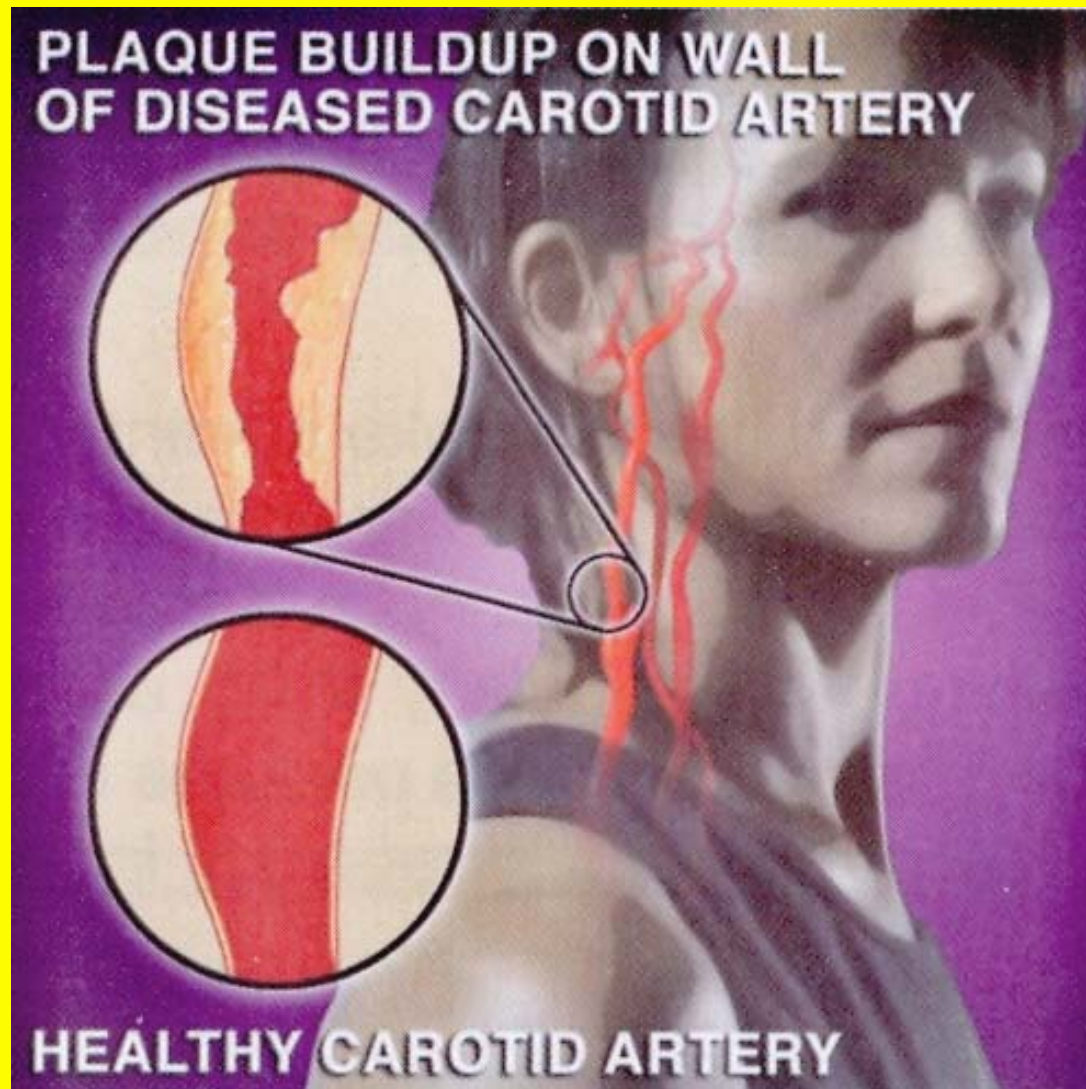
Stroke: warning signs

- Sudden numbness/weakness-
face/arm/leg: one side
- Confusion: trouble speaking/
understanding
- Trouble seeing: one/both eyes
- Trouble walking, dizziness, loss
balance/coordination
- Sudden: severe headache

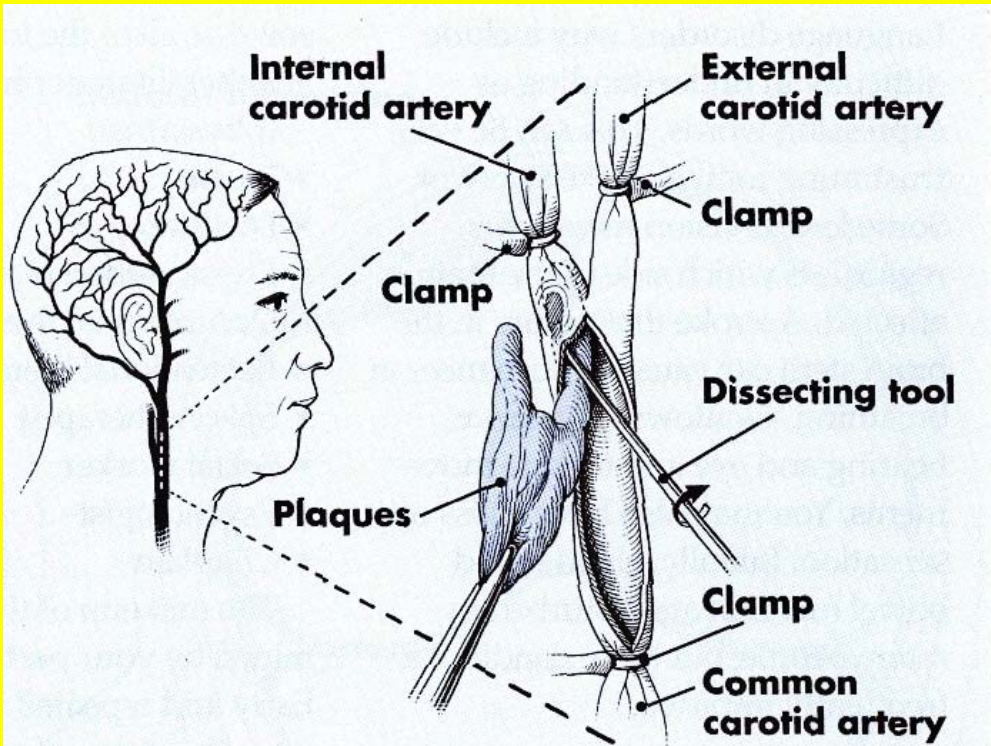
Ischemic vs. hemorrhagic stroke

- Ischemic: due to atherosclerosis
- Blood clot (thrombus) → rough plaque ← surface
- Or wandering clot (embolus) from heart valve/other artery body → death brain ← plugs brain artery cells

Embolus



Carotid artery surgery



If blood flow to the brain is blocked by an obstruction in the carotid artery, a surgical procedure called an endarterectomy may be done. Clamps are placed on the artery to stop blood flow while fatty deposits (plaques) inside the artery are removed with a dissecting tool.



Senator
Kennedy
2007

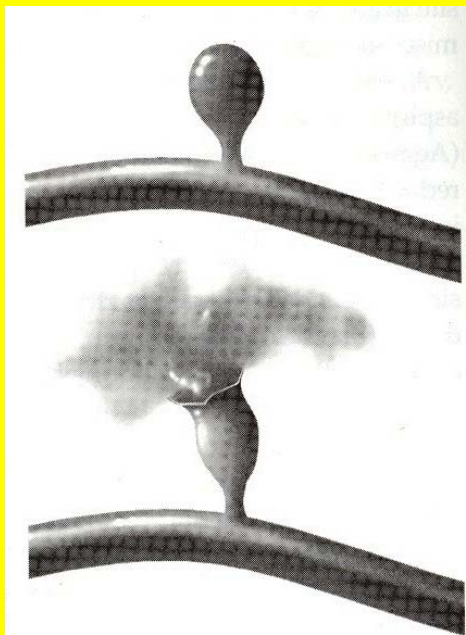
Peripheral Artery Disease



Poor leg circulation can lead to heart attack or stroke

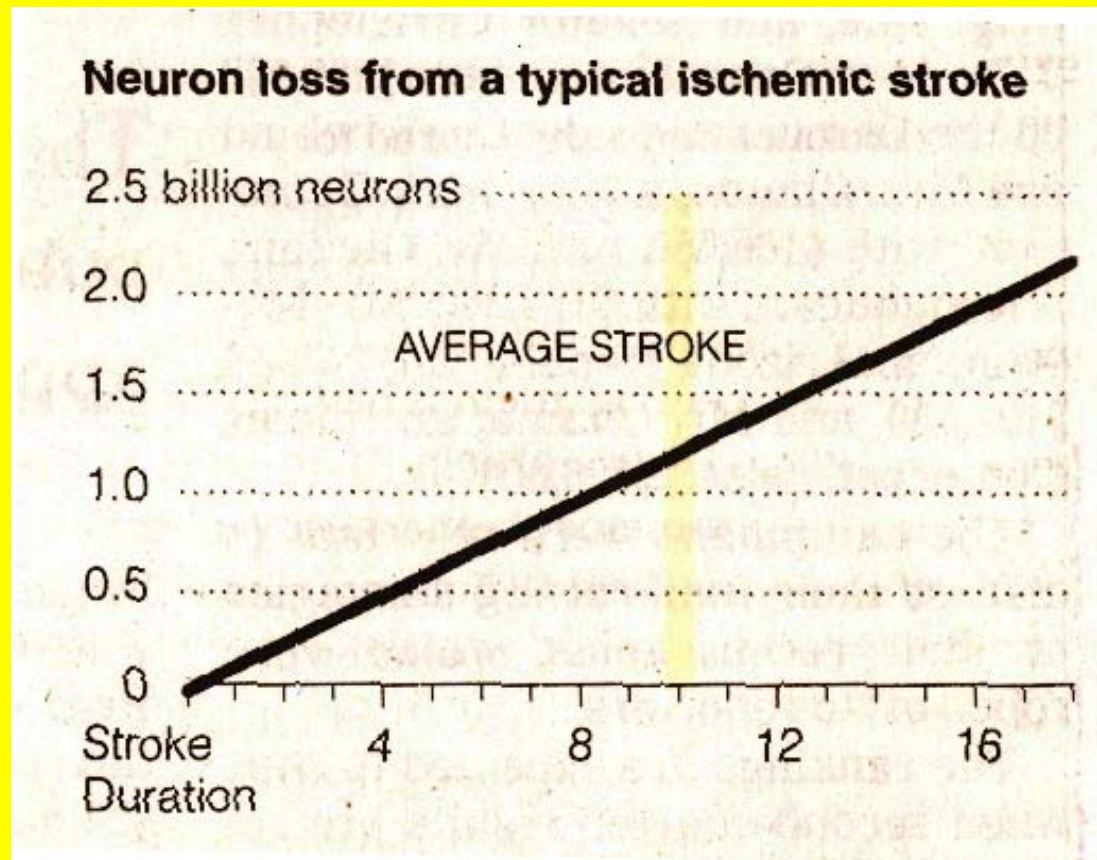
Hemorrhagic Stroke

- Artery in brain leaks or ruptures

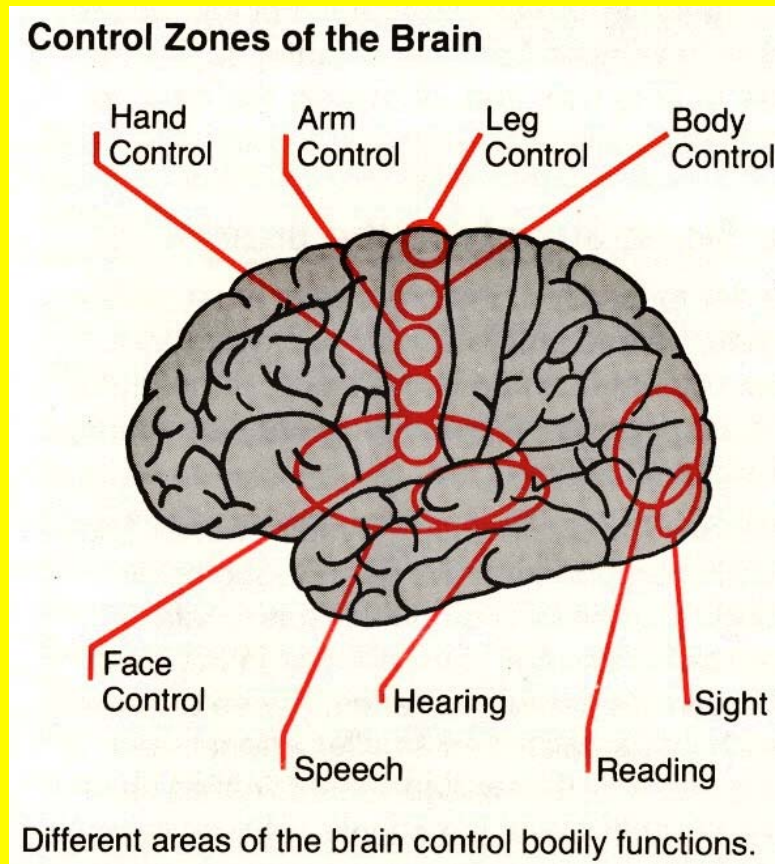


An aneurysm is a ballooning of an artery from a weak area in its wall. Over time, the wall stretches and becomes thin enough to rupture.

Death- brain neurons: rapid
Average stroke: lasts **10** hours-
kills >5% of neurons in forebrain



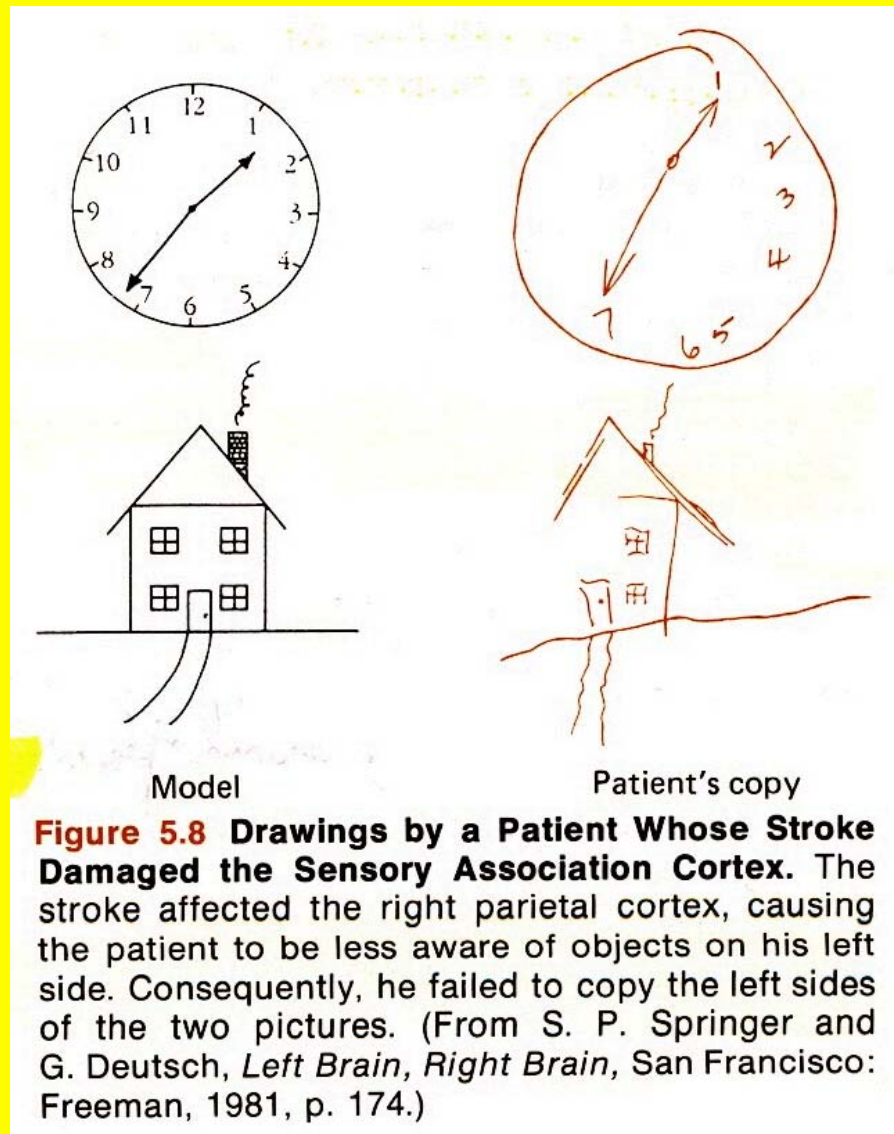
- Stroke right side brain →
left side body ← impairs
- Vice versa



Possible outcomes

- Difficulty understanding/speaking words (**word blindness**)
- Impaired movement, sensation, bladder/bowel functions, breathing, swallowing, balance, hearing, seeing, **coma**
- Psychological: **helplessness, frustration, mood changes**

Drawing by Stroke Patient

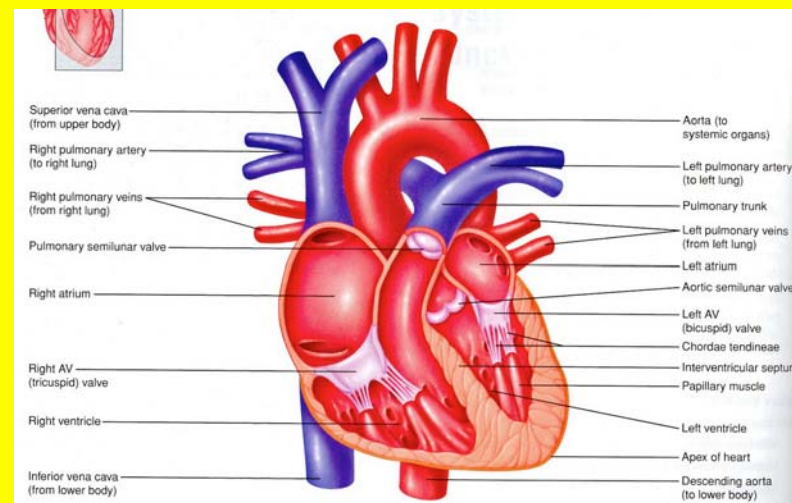
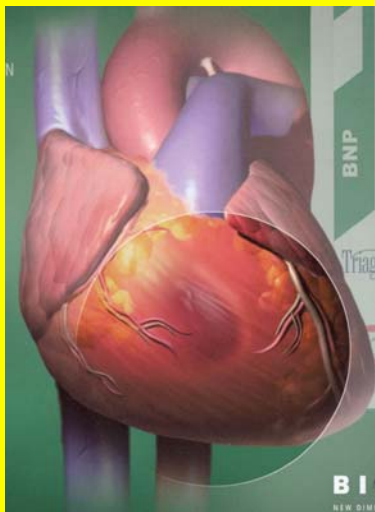


Stroke: Are you at risk? Risk Factors

- Family history: stroke or TIA
- ↑ Age
- Women: **53%** stroke victims
Ages 45-54: 2X risk vs. men
- Blacks > whites
- ↑ Blood pressure

Stroke: Risk Factors

- Cardiovascular disease: congestive heart failure, heart attack, heart valve disease, atrial fibrillation (15-20% strokes)



Stroke Risk Factors

- Smoking
- Diabetes
- High blood cholesterol (LDL)
- Lack of physical activity
- Atrial Fibrillation (AFIB)

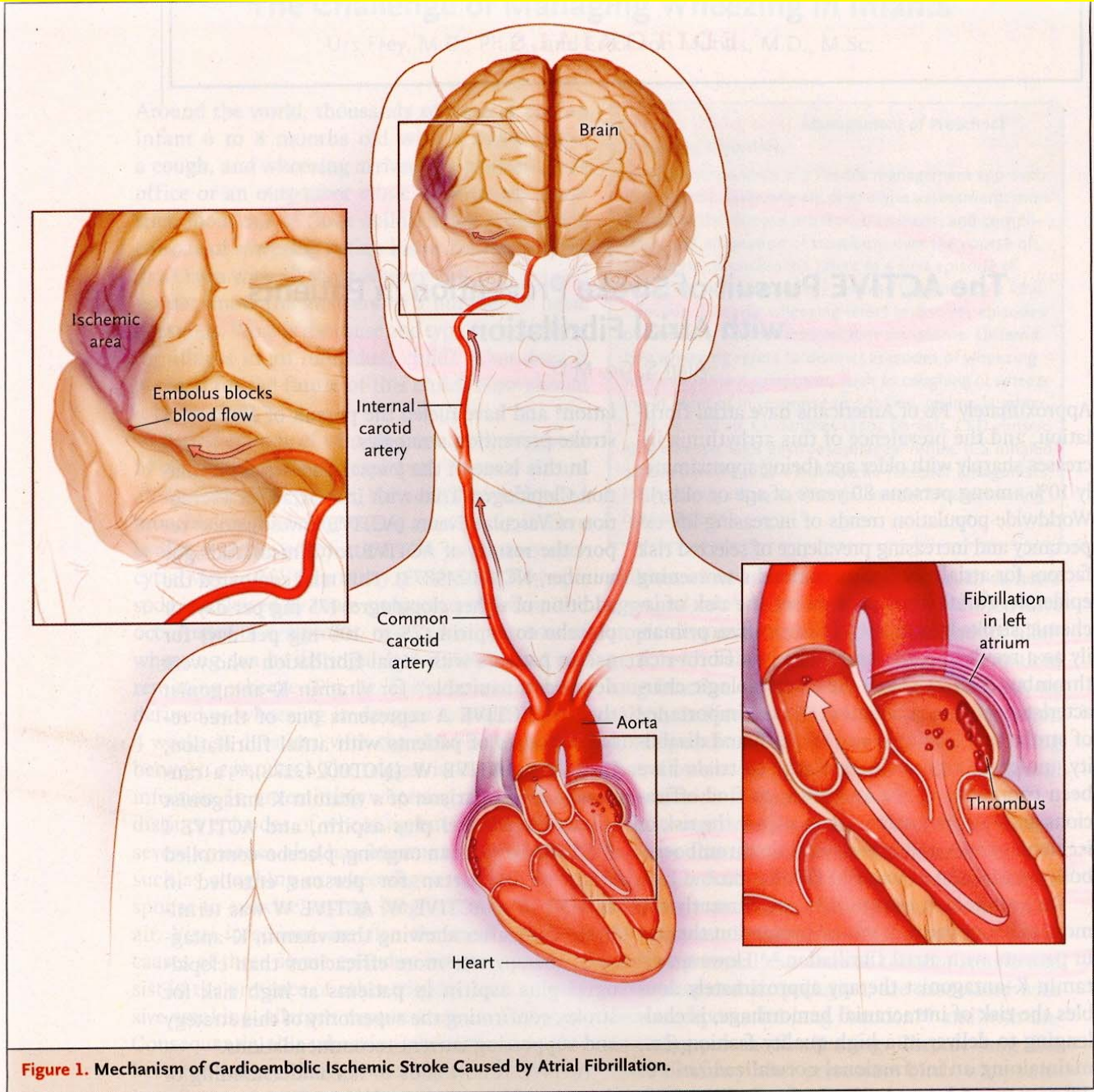


Figure 1. Mechanism of Cardioembolic Ischemic Stroke Caused by Atrial Fibrillation.

Stroke victim profile

- **Dr. Diana Fite:** ER doctor-
Houston, age 53
- B.P. 200/120 → nothing done



Stroke victim profile

- June 7, 2006- driving: right hand wheel, left hand cell phone
- Suddenly: right side body weakness
- Couldn't steer, couldn't take foot off gas pedal
- Ambulance: ER

ER treatment she requested

- **Injection: tissue plasminogen activator (tPA): dissolves clot**
- **The only effective ER treatment**
- **Must be given: within 3 hours**
- **Most people wait or ER's not properly equipped (stroke)**
- **She survived- no disability**

Stroke victim profile

- **Michael Collins-** police officer- Maryland, 49 years old
- Stroke in police car- numbness left hand
- Forced to retire:
Police must shoot either hands



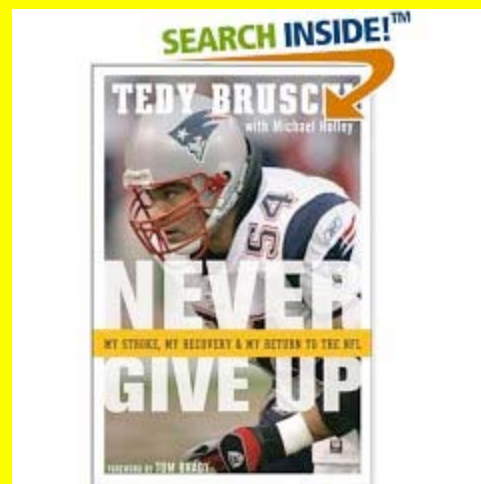
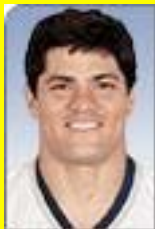
Tedy Bruschi Linebacker Patriots

Stroke at age 32

Blood clot- hole in heart → brain

"I woke up... pain in back of my neck.
Left side of my arms & leg felt
funny... some numbness." Globe

9/2/05



Women and Strokes

- 800,000 Americans have strokes/year
- 3 out of 5 stroke deaths: women
- Women: nontraditional stroke symptoms

**Mental confusion,
disorientation, pain in face,
lightheadedness, weakness,
nausea, chest pains &
palpitations**

Women at risk of stroke

- **Menopause**
- **Abdominal obesity**
- **Hormone replacement therapy
(estrogen +/- progestin)**
- **Atrial Fibrillation**
- **Migraines**

Stroke Prevention Women

- Control blood pressure
- Stop smoking
- ↓ Cholesterol & Triglyceride
- Regular exercise
- Limit alcohol (1 drink/day)
- Overweight or obese: lose weight
- > 65: AHA: 81 mg aspirin/day

Stroke Rehabilitation



Robotics & Strokes

Stroke patient tries
to move arm

Sensors: skin triceps sends

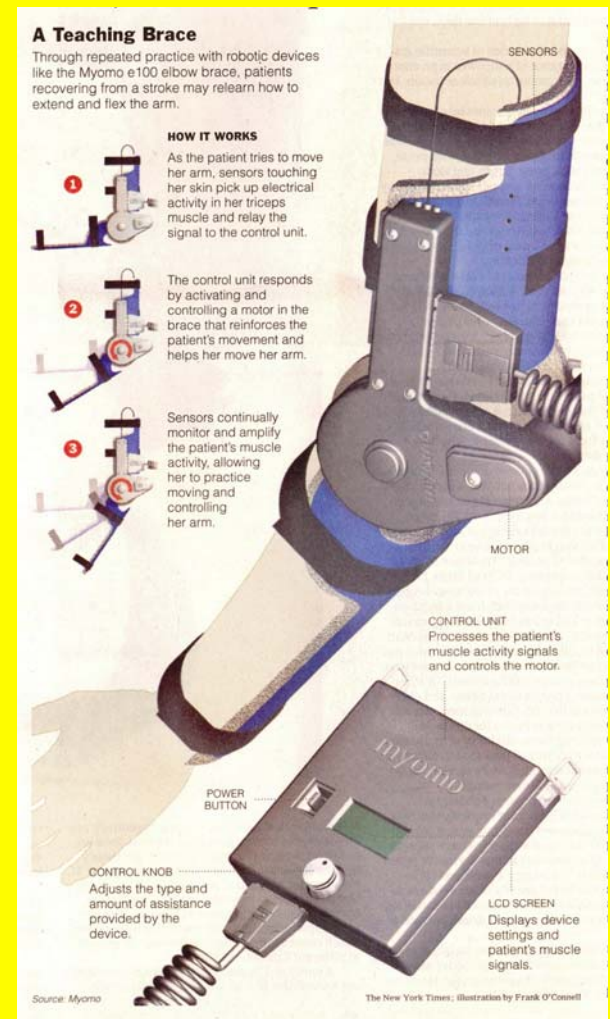
Signal → **robotic arm brace**

- Robot motor: **reinforces**

Patient's movements:

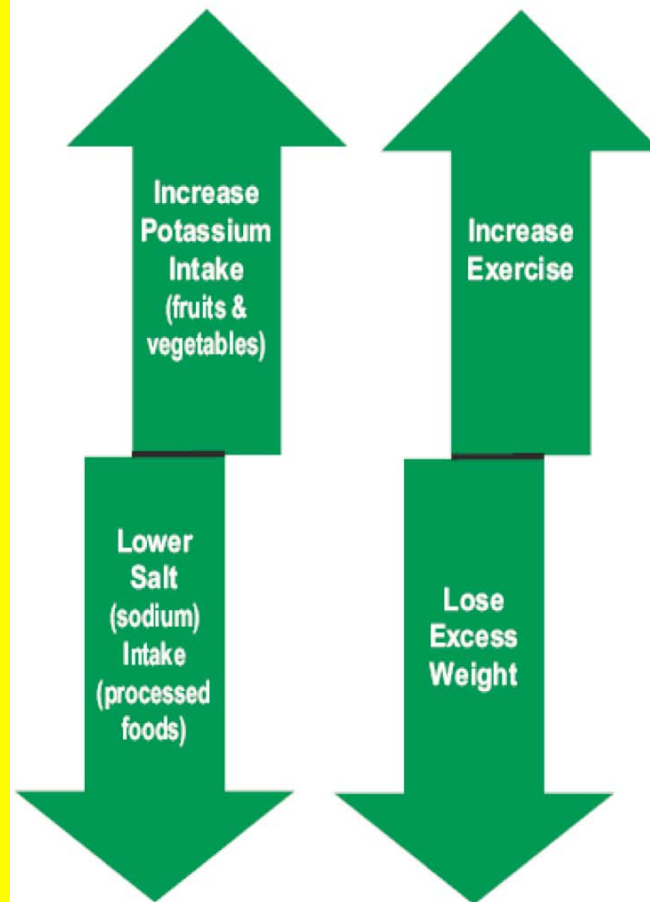
Arm moves

- **"Amplifies"** patient's
muscle activities



KEY POINTS

REDUCE YOUR BLOOD PRESSURE



KEY POINTS

...what to eat 113

SODIUM

**Limit: 2300 milligrams
per day**

Food Label Key Words:

low sodium, low salt, no-salt added,
reduced sodium/salt, sodium-free, unsalted

Avoid: sodium, salt, sodium chloride

Limit your use of salt:

At the table, during cooking, in cold-cuts
and preserved meats, prepared foods,
soy sauce, "ready-to-eat" foods, packaged
foods/snacks

KEY POINTS

...what to eat 114

POTASSIUM

Recommendation:

4,700 milligrams every day

Consider these*:

Tomato paste/puree/sauce, sweet potato, beet greens, baked potato, beans (white, soy, lima, kidney), cooked dry beans, yogurt, clams, prune juice, carrot juice, blackstrap molasses, halibut, tuna, winter squash, rockfish, cod, bananas, spinach, tomato juice, peaches, prunes, non-fat/low-fat milk, apricot, rainbow trout, cantaloupe, honeydew melon, lentils, plantains, oranges, orange juice, split peas.

Are all pizzas created equal?

- Visit the following restaurants. Ask to see a **Nutrition Information sheet**. Note response. If hardcopy is not available, go to their WEB site to find nutrition information.
- Restaurants: **Pizza Hut, Papa Ginos, Pizzeria Uno, Dominos, Caesar's**

Get Information: **small cheese pizza**

- Serving size (assume: 1 pizza) and grams
- Calories
- Calories/gram
- Total fat (grams)
- Saturated fat (grams)
- Trans fat (grams)
- Cholesterol (milligrams)
- Sodium (milligrams)

Are all frozen pizzas the same?

- Visit a supermarket's frozen food section.
- Find the following frozen cheese pizzas: **Mystic, Stouffer's, Celeste, Ellios, DiGiorno, Tombstone, California Pizza Kitchen**

Get information for a cheese pizza

- Serving size (assume: 1 pizza) and grams
- Calories
- Calories/gram
- Total fat (grams)
- Saturated fat (grams)
- Trans fat (grams)
- Cholesterol (milligrams)
- Sodium (milligrams)