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Understanding Hypertension

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Hypertension and Cardiovascular Risk

- Treatment of hypertension is targeted at reducing risk of stroke, heart disease, heart failure, and kidney failure
- Cardiovascular disease is a leading cause of morbidity and mortality in the United States
- 2 million Americans have heart attack or stroke per year, with 800,000 deaths
- Of these, heart disease is the leading cause of death. Most patients who have had a stroke succumb to heart disease.

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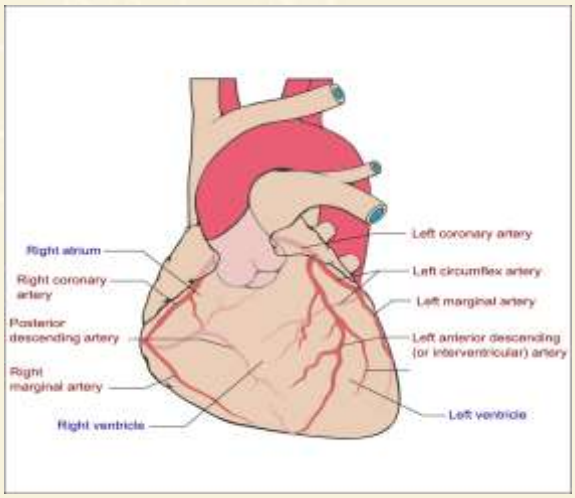
Heart of the Matter



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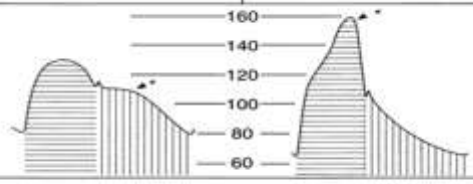
What is Blood Pressure?

	Normal Aorta (Young Adults)		Stiff Aorta (Older Adults)
1. Aortic BP *(mm Hg)*	130 80	Systolic Diastolic	140 70
2. PWV *(m/s)*	5.0		10.0
3. Reflected Wave	Early Diastole		Late Systole
4. Pulse Wave Shape			
5. Aortic BP *(mm Hg)*	130 80	Systolic Diastolic	160 70

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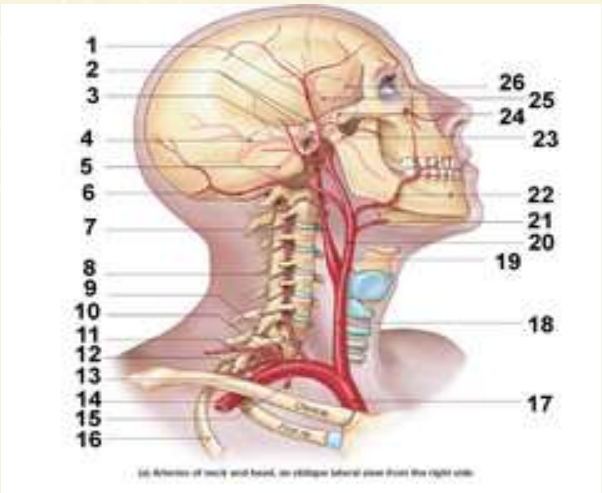
The Nerve Center



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Cardiovascular Risk Factors

- High blood pressure
- Smoking
- Obesity BMI>30
- Physical inactivity
- Abnormal lipids
- Diabetes
- Proteinuria
- Renal disease
- Age
- Family history

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Damage From High Blood Pressure

Heart- angina, heart attack, heart failure, death
Brain – stroke
Kidney- chronic kidney disease- kidney failure
Blood vessels- peripheral artery disease-
Eyes- retinopathy

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High Blood Pressure Treatment Works!

Prevention of symptoms (rarely applies)
Prevention of early death/disability
Has been very successful
50% reduction in age-adjusted mortality rate for heart disease since 1970
60% reduction in age-adjusted mortality for stroke since 1970

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Treatment Decreases Risk of Events

Complication	Average Reduction
Stroke	35-40%
Heart attack	20-25%
Heart failure	50%

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Blood Pressure Classification JNC 7

Normal	<120	<80
Prehypertension	<120-139	80-89
Stage 1 Hypertension	140-159	90-99
Stage 2 Hypertension	≥160	≥100

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Hypertension Prevalence- NHANES 2010

30 % of persons over age 18 – no change over the last decade

Age	Prevalence	**Race**	Prevalence
18-39	6.8%	Hispanic	26.1%
40-59	30.4%	White	27.4%
≥60	66.7%	Black	40.4%

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Hypertension Prevalence- NHANES 2010

Income (%pov)	Prevalence	**Obesity**	Prevalence
<100	32.8%	Yes	40.5%
100-199	32.5%	No	25%
200-399	30.6%		
400-499	28%		

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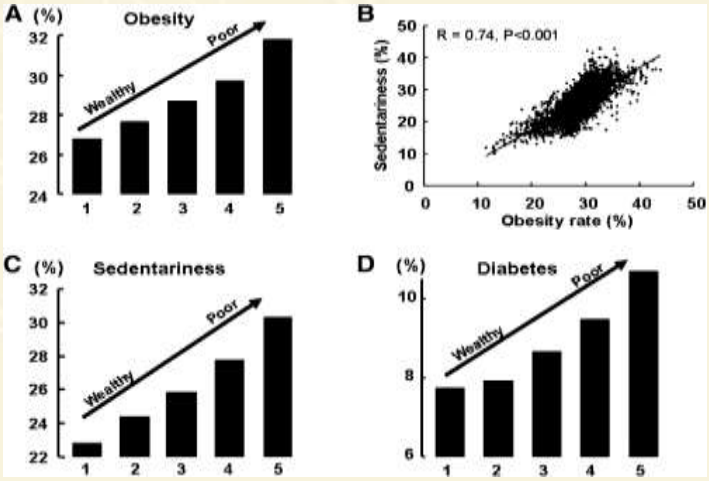
Diabetes and Income



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Hypertension Control- NHANES 2010

At this time control rate Nationally was 48%

Insurance	Control	**Race**	Control
Private	50.6%	Hispanic	34.4%
Public	60.2%	White	52.6%
Uninsured	27.9%	Black	42.6%

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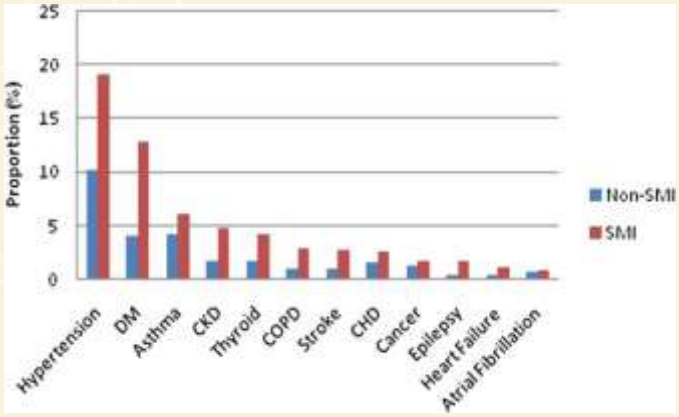
Hypertension and SMI



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Patients with SMI- Lifestyle

Smoking > 2/3
Obesity over 40%, 60% in women
Diabetes
Sedentary
Dietary Choices/Options

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Blood Pressure Measurement

- Use auscultatory method with a calibrated and properly sized cuff
- Requires a stethoscope
- Sizing is marked on most cuffs

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Stethoscope Use

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Blood Pressure Measurement

Patient should be seated quietly for 5 minutes, in a chair, feet on the floor, and arms supported at heart level.

If elevated, confirm in opposite arm.

To make the diagnosis, need 2 blood pressures from separate occasions in the office

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Automated Blood Pressure Cuff- Omron 705cp

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Patient Evaluation

Assess lifestyle and identify other cardiovascular risk factors

Find identifiable causes of hypertension

Assess the presence or absence of target organ damage and cardiovascular disease

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Initial Laboratory Evaluation

Electrocardiogram (EKG)

Urinalysis

Comp panel, glucose, electrolytes, creatinine, calcium

Complete blood count

Lipid panel

Urine microalbumin (protein)

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Identifiable Causes of Hypertension

Sleep apnea	Chronic steroids
Drugs- alcohol, stimulants*	Adrenal tumor
Chronic kidney disease	Aortic problems
Vascular kidney disease	Parathyroid disease

Most hypertension the cause is unknown- labelled "essential" hypertension

*SNRIs reported to increase BP have not personally seen

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Blood Pressure Follow up by Classification

Normal (<120, <80) recheck in 2 years

Prehypertension (120-139/80-89) recheck in 1 year

Stage 1 (140-159/90-99) recheck within 2 months

Stage 2 (>160/>100) Evaluate, follow up within 1 week to 1 month

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Goals of Therapy JNC 8

- Reduce heart disease, stroke and kidney morbidity and mortality
- Under age 60 start medication at BP 140/90, and treat to BP <140/90
- If over 60 start medication at 150/90 and treat to BP<150/90

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Risk Reduction

- Starting at 115/75 mmHg, CVD risk doubles with each increment of 20/10 throughout the blood pressure range.
- The blood pressure relationship to CVD is continuous – there is no magic number
- Greatest benefit is for those that go from severely uncontrolled to moderate control

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Lifestyle Modification

Weight loss	5-20mm/Hg /10kg
DASH diet	8-14mm/Hg
Sodium (salt) restriction	2-8mm/Hg
Physical activity	4-9mm/Hg
Moderation alcohol intake	2-4mm/Hg

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Treatment Options JNC 8 – Initial Treatment

Diuretics- chlorthalidone*, HCTZ
ACE inhibitors- lisinopril*
Calcium Channel Blockers- amlodipine*
ARBs- valsartan, losartan

Not Beta Blockers
*my personal favorites

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Follow-up and Monitoring

Return to adjust meds usually minimum 2 weeks for changes to stabilize

Monitor Serum K+, creatinine, electrolytes, fasting lipids, U/A at least annually

Once at goal and stable, follow up every 3-6 months

Co-morbidities e.g. CHF, DM, influence frequency of follow up

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Causes of Resistant Hypertension

Improper BP measurement

Excess sodium

Noncompliance with medication

Inadequate doses of medication

Drug interactions (Advil)

Excess alcohol

Untreated or undiagnosed sleep apnea

Stimulants

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Drug treatment plan

- Hypertension SBP>140, DBP>90 if over 60 150/90
- If lifestyle modification does not work start chlorthalidone 25 mg qd.
- BP goal under 140/90, over 60 150/90
- Add lisinopril 10-40 mg qd as needed for second drug
- If third drug needed amlodipine 2.5-10 mg qd

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LIFESTYLE APPROACHES TO HYPERTENSION MANAGEMENT

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Essential Lifestyle Modifications for Management of Hypertension

*Lose Weight – losing just 10 lbs. can help lower blood pressure!

*Shake the salt habit

*Adhere to the DASH diet

*Be active every day

*Quit smoking

*Avoid alcohol and caffeine in excess

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Shaking out Salt vs. Sodium

Salt (sodium chloride) is 40% sodium;
1 tsp = 2,300 mg sodium

Excess sodium intake can cause fluid (water) retention and can increase blood pressure, making the heart work harder

Normally, the kidneys excrete excess dietary sodium and stimulate our thirst mechanism to dilute it; however, some individuals are "salt-sensitive" and tend to retain excess sodium (up to 70% of adults) – and are more likely to develop hypertension

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What the science says on sodium…

2010 Dietary Guidelines:

General population: ≤2,300mg/day; people with high blood pressure, diabetes, chronic kidney disease, African American, and >age 51: ≤1,500mg/day

2013 Institute of Medicine:

Not enough evidence available to support that an intake of ≤ 2,300mg/day offers benefits; however, excessive intake associated with increased heart disease risk

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Where's the Sodium?

The lion's share of the sodium in our diets – about 75% - comes from restaurant, fast food, and processed foods

Many restaurant and fast food menus feature items that can provide 4000-8000 mg per serving!



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Foods High in Sodium

Pickles, olives, sauerkraut
Condiments (ketchup, BBQ sauce, salad dressings)
Canned vegetables, tomato and V-8 juice
Meats: Ham, bacon, sausage, lunch meat
Many frozen meals/snacks (think Pizza Rolls)
Some snack foods (chips, pretzels, etc.)
Soups: Canned, instant (including Ramen noodles)
Fast food: Burgers, Pizza, Chicken
Asian fare (soy and tamari sauce, etc.)

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Foods low in sodium

Products labeled “very low sodium” or “sodium-free”
Fresh fruits and vegetables!
Canned and dried fruits
Potatoes, rice, pasta
Unsalted nuts and seeds

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Shake the Salt Habit – Advice for Clients

*Toss the salt shaker!

*Use fresh-ground pepper and salt-free spice blends (e.g. Mrs. Dash)

*Use flavored vinegars, lemon or lime juice, garlic, and fresh or dried herbs to season foods

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Shake the Habit…Advice for Clients

*Avoid processed foods that come in a box or can – especially pasta/rice mixes, Ramen noodle soup cups (1500 mg sodium each!), canned pasta and regular canned soups, pickles and condiments

*Instead of chips, choose unsalted popcorn, unsalted nuts, fruit, “veg-out” bag (raw veggies) for snacks

*Cut way back on fast food!

*Read food labels!

Low sodium = <140 mg sodium/serving

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Menu Madness…

Patient with schizoaffective disorder and HTN reports the following in response to a 24-hour dietary recall:

Breakfast: Sausage-egg biscuit at McD's

Lunch: Salami sandwiches (2), entire package of ramen noodle soup, large dill pickle

Dinner: Hungry Man Cajun BBQ frozen dinner

Snack: 1 oz. bag Cheetos

Total sodium intake: ~5000-6000 mg!

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Menu Makeover…

Breakfast: 2 c. puffed wheat cereal, banana, fat-free milk

Lunch: Healthy Choice Zesty Gumbo soup (460 mg sodium)

Turkey sandwich with lettuce/tomato, avocado slices, baby carrots, cucumber slices, canned peaches

Dinner: Healthy Choice entrée, large plate salad greens, applesauce, fat-free milk

Snack: unsalted almonds, fat-free Greek yogurt, apple

Total Sodium Intake: ~2000-2300 mg

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DIETARY APPROACHES TO STOP HYPERTENSION DASH STUDIES

Two clinical trials
sponsored by the NHLBI
and conducted at four
medical centers

NIH National Heart, Lung, and Blood Institute

Studies published in the
NEJM (1997)

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First DASH study

*Involved 459 adults
*27 had high blood pressure
*About 50% were women and 60% were African Americans – landmark cohort!
*Compared 3 eating plans
*All plans included about 3000 mg sodium

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Results were dramatic!

Participants who followed both eating plans that included more fruits and vegetables and the DASH eating plan had reduced blood pressure.

The DASH plan had the greatest effect – *especially* for those with high blood pressure

Blood pressure reductions came fast – *within two weeks of starting the plan*!

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Second DASH Study

Looked at Reduced Sodium Intake

Participants followed either DASH eating plan or an eating plan typical of what many Americans consume

412 participants, randomized to one of the two eating plans, and then followed for a month at each of three sodium levels (3300 mg, 2300 mg, or 1500 mg per day)

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Results: Reducing sodium intake lowered blood pressure for both eating plans

Greatest blood pressure reductions were for the DASH eating plan at the sodium intake of 1500 mg per day

Those with high blood pressure saw the greatest reductions

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SUMMARY - DASH STUDIES

TOGETHER, THESE TWO STUDIES UNDERSCORE THE IMPORTANCE OF LOWERING SODIUM INTAKE

FOR A WINNING BP COMBINATION – EMPHASIZE FOOD SOURES OF POTASSIUM, MAGNESIUM AND CALCIUM AND REDUCE INTAKE OF SODIUM!

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The DASH Diet…Top-Ranked Every Year!

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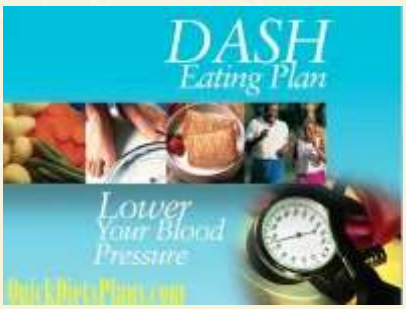
Excellent Guide – including sample menus available for free download from the NHLBI:

http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/dash/_inbrief.htm



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How, exactly, Do you *Do* the DASH?

*8-10 servings of Fruits and Vegetables/day

*2-3 servings of low-fat or fat-free dairy products

*Unsalted nuts, whole grains, legumes

*Small servings of meat, fish, poultry

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How does the DASH Diet work?

The diet is high in a mineral “mix” of potassium, magnesium and calcium which relax small blood vessels *and* low in sodium - both of which work synergistically to lower blood pressure

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What's brewing with Caffeine and Blood Pressure?

*Caffeine can cause a temporary, but dramatic, increase in blood pressure (and heart rate in some) - unclear what causes this spike

*Some who drink caffeinated beverages regularly develop a tolerance to caffeine, and as a result caffeine doesn't have a long-term effect on BP

*Seems to have a stronger BP-increasing effect in men who are older than 70 and are overweight

*Can limit to 200 mg a day – about the same as 2-12 oz cups of coffee

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Physical Activity: The non-medication way to lower blood pressure

*Becoming more active can lower systolic blood pressure by an average of 4 to 9 millimeters of mercury (mm Hg)

*American Heart Association recommends 150 minutes of moderate exercise, 75 minutes of vigorous exercise or a combination of both each week

*Aim for at least 30 minutes of aerobic activity most days of the week (can be broken into three 10-minute sessions to get the same benefit)

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Be Active!

*Limit Screen Time

*Remember that sitting is the "new smoking"

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Summary: Encourage Small Steps in Lifestyle Modifications to Help Control BP

*Move more – get off bus one stop earlier, walk an errand, walk dog several times a day instead of just once, watch 1 less hour of television, wear a pedometer to track daily steps and set small, achievable goals

*Eat one more fruit and one more vegetable a day than one would normally

*Consume 8 oz. of fat-free-1% milk or calcium-fortified almond of soy milk daily

*Decrease intake of caffeine – make the switch to "half-caff"

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Encourage your low-income clients to connect with fresh food options…

*Farmers' markets accept EBT cards (food stamps) and programs like "Double Up Food Bucks" www.doubleupfoodbucks.org

*Many food pantries offer fresh produce

*Encourage growing fresh herbs in pots to season foods

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Encourage clients to buy their snacks here…

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Not there…

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Advise Clients to "Put a Rainbow" or "two Fists of Color" on their plate at every meal -

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