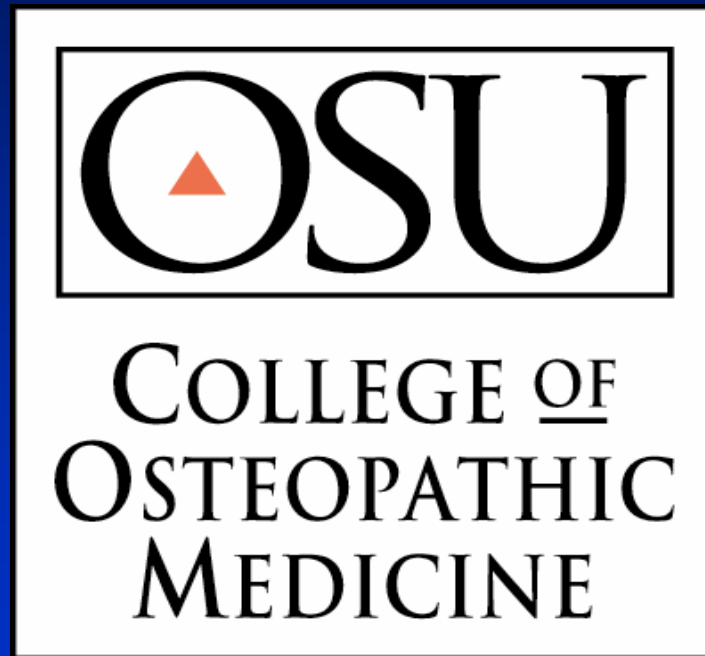


High Blood Pressure - Summary of JNC Six



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Introduction

- Hypertension treatment #1 reason for office visit for prescription
- Only 27% Americans with HTN have control (140/90 or lower)
- In > 65 years, over 50% have HTN
- Mortality rates declined for stroke and coronary heart disease but leveling off
- End stage renal disease and CHF increasing

Introduction

- Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC-VI) has new guidelines
- Blue ribbon panel From NIH, National Heart, Lung, and Blood Institute (www.nhlbi.nih.gov)
- Published 1997 (Kaplan N, Treatment of hypertension: insights from JNC-VI report : AFP October 15, 1998)

Objectives

- Recognize frequency and importance of high blood pressure in US population
- Define hypertension, high normal BP
- List risk factors for cardiovascular disease
- Recognize lifestyle modifications for HTN
- Learn initial and follow-up RX choices

Hypertension

<u>Category</u>	<u>Systolic (mm Hg)</u>	<u>Diastolic</u>
Optimal	< 120	< 80
Normal	< 130	< 85
High normal	130-139	85-89
Hypertension		
Stage 1	140-159	90-99
Stage 2	160-179	100-109
Stage 3	≥ 180	≥ 110

Hypertension - Initial Evaluation

- History and physical exam
- Establish cardiovascular risks
- Lab
 - CBC, UA, Chem 7, lipids, and ECG for screening

Additional Diagnostic Procedures - When?

- Poor response to drugs
- Well controlled BP that suddenly rises
- Stage 3
- Sudden onset HTN

Additional Diagnostic Procedures - When?

- History and physical abnormalities
 - paroxysmal HTN, HA, palpitations, pallor, perspiration (pheochromocytoma)
 - abdominal / flank bruits (renovascular dis.)
 - abdominal / flank masses (polycystic kidney)
 - delayed / absent femoral pulse (coarctation)
 - obesity, striae (Cushings)

Additional Diagnostic Procedures - When?

- Laboratory abnormalities
 - Hypokalemia (primary aldosteronism)
 - Hypercalcemia (hyperparathyroidism)
 - High creatinine / UA abnormality (renal parenchymal disease)

Cardiovascular Risk Stratification

- Major Risk Factors
 - smoking
 - dyslipidemia
 - DM
 - > 60
 - male or post menopausal female, fam. hx MI men < 55 or women < 65

Cardiovascular Risk Stratification

- Clinical CV Disease (CCD) / Target Organ Damage (TOD)
 - LVH, angina, MI, CHF, coronary revascularization
 - stroke / TIA
 - nephropathy, retinopathy, peripheral artery disease

Cardiovascular Risk Stratification

- Risk Group A (no risks, no TOD or CCD)
 - High normal and Stage 1
 - lifestyle modification up to 12 months
 - Stage 2 and 3
 - Drug therapy

Cardiovascular Risk Stratification

- Risk Group B (1 risk, no DM, no TOD or CCD)
 - High normal and Stage 1
 - lifestyle modification up to 6 months
 - Stage 2 and 3
 - drug therapy

Cardiovascular Risk Stratification

- Risk Group C (DM and/or TOD / CCD)
 - High normal and Stage 1
 - drug therapy
 - Stage 2 and 3
 - drug therapy

Blood Pressure Follow-Up

At initial visit:

<u>Systolic</u>	<u>Diastolic</u>		<u>Recommendation</u>
< 130	< 85	<input checked="" type="checkbox"/>	recheck 2 years
130-139	85-89	<input checked="" type="checkbox"/>	recheck 1 year
140-159	90-99	<input checked="" type="checkbox"/>	confirm in 2 months
160-179	100-109	<input checked="" type="checkbox"/>	care within 1 month
≥ 180	≥ 110	<input checked="" type="checkbox"/>	care immediate or in 1 week (clin. eval.)

White Coat Hypertension

- Up to 30% of patients with office readings $> 140/90$ have out of office readings $< 135/85$
- Little cardiovascular risk in 5-10 year F/U of this group
- With no nephropathy, no DX or RX of hypertension recommended

Lifestyle Modifications

- Weight loss if overweight
- Limit alcohol to < 1 ounce/day
- Exercise 30 - 45 min. “most days”
- Reduce Na (6 gm NaCl or 2.4 gm Na)
- Adequate K⁺ (90 mmol/day)
- Adequate Mg and Ca
- Stop smoking
- Reduce saturated fats and cholesterol

Oral Hypertension Drugs

- Diuretics (hydrochlorothiazide, metolazone)
 - short term
 - increase chol, glucose, urate, Ca
 - decrease K, Na, Mg
 - rarely photosensitivity, pancreatitis
 - loop diuretics (furosemide) not recommended first line

Oral Hypertension Drugs

- Adrenergic inhibitors
 - peripherals (guanadrel, guanethidine, reserpine)
 - postural hypotension, diarrhea
 - central alpha agonists (clonidine, guanabenz, guanfacine, methyldopa) - sedation, dry mouth, bradycardia,
 - alpha blockers (doxazosin, prazosin, terazosin)
 - postural hypotension

Oral Hypertension Drugs

- Adrenergic inhibitors
 - beta blockers (propranolol, atenolol, metoprolol, nadolol, pindolol, timolol) -
brochospasm, bradycardia, CHF, mask hypoglycemia, low exercise tolerance, fatigue

Oral Hypertension Drugs

- Adrenergic inhibitors
 - combined alpha and beta blockers (carvedilol, labetalol) - postural hypotension, bronchospasm
- Direct vasodilators
 - (hydralazine, minoxidil)
 - HA, tachycardia, fluid retention, lupus syndrome, hirsutism

Oral Hypertension Drugs

- Calcium channel blockers
 - dihydropyridines (nifedipine, amlodipine, felodipine, isradipine) - ankle edema, flushing, HA, gingival hyperplasia
 - non- dihydropyridines (diltiazem, verapamil, mibefradil) - conduction defects, worsening CHF, gingival hyperplasia

Oral Hypertension Drugs

- ACE inhibitors
 - (captopril, enalapril, lisinopril, benazopril, fosinopril, moexipril, quinapril, ramipril)
 - cough
 - rarely angioedema, hyperkalemia, rash, dysgusia, leukopenia

Oral Hypertension Drugs

- Angiotensin II receptor blockers
 - (losartin, valsartin, irbesartan
 - hyperkalemia, rarely angioedema
- Combinations
 - beta blocker and diuretic
 - ACE inhibitor and diuretic
 - CCB and ACE inhibitor
 - others

Drug Considerations

- Uncomplicated HTN - diuretic and beta blocker
- Heart Failure - ACE inhibitor, diuretic
- Isolated Systolic HTN - diuretic (preferred) then long acting dihydropyridine
- MI - beta blocker (non ISA) then ACE inhibitor (systolic dysfunction)
- DM Type 1 & proteinuria - ACE inhibitor

Hypertensive Crisis

- Hypertensive encephalopathy
- Intracranial hemorrhage
- Unstable angina
- Acute MI
- Acute LVH with pulmonary edema
- Dissecting aortic aneurysm
- Eclampsia

Hypertensive Crisis

- Elevated BP alone without symptoms rarely requires emergency therapy!
- Urgency = use fast-acting oral drugs
- Emergency:
 - goal = reduce BP 25% in 2 hours, then 160/100 in 6 hours (avoid fast falls)
 - monitor Q 15-30 minutes
 - routine SL nifedipine “not appropriate”

Hypertensive Crisis

- Vasodilators
 - sodium nitroprusside - N&V, twitching, sweating, cyanide intoxication (caution high intracranial pressure)
 - nicardipine - tachycardia, HA, flushing, phlebitis (caution CHF, ischemia)
 - NTG - for coronary ischemia
 - others

Hypertensive Crisis

- Adrenergic inhibitors
 - labetalol (N&V, scalp tingling, burn throat, heart block, orthostasis) - not in acute CHF
 - esmolol - (nausea, hypotension) - use in aortic dissection
 - phentolamine (tachycardia, flushing, HA) - use in catecholamine excess

Other Lifestyle Factors

- Fats - little affect BP, but good for cardiovascular health
- Caffeine - acute raise, but not chronic (tolerance)
- Relaxation and biofeedback - little longterm lower BP
- Smoking / tobacco - higher BP
- Other - garlic/onion, protein, not proven

Not At Goal Blood Pressure?

- Inadequate response / well tolerated
 - add second agent different class
 - diuretic if not already used
 - continue adding, consider referral
- No response/troublesome side effects
 - substitute from other class
 - continue adding, consider referral

Not At Goal Blood Pressure?

- Pseudoresistance
 - white coat HTN, pseudoHTN, cuff
- Drug related causes
 - dose, combination, interactions, food, cocaine, antidepressants, NSAIDs
- Associated conditions - smoking, obesity, sleep apnea, insulin resistance, etoh, anxiety, pain, arteritis

Improving Compliance

- Educate patient and family re: goals
- Home BP measurement
- Care inexpensive / simple (long acting)
- Encourage lifestyle modifications
- Least side effects possible - monitor / change when needed
- Encourage positive attitude!
- Visits with nurse / teams

Other Considerations

- Ethnic issues
 - higher Stage 3, stroke, CHD, renal complications in African Americans
 - slightly higher rate in American Indians
 - Hispanics rate slightly less
 - African Americans do better with diuretics/CCB, and worse ACE inhibitors than general population

Other Considerations

- Children and adolescents
 - 95% or higher considered elevated
 - dose adjusted for weight, careful titration
 - ACE inhibitors and angiotensin II receptor blockers not used in pregnant or sexually active girls (neonatal problem)
 - watch for anabolic steroid use

Other Considerations

- Women
 - BCP use, especially obese/ >35
 - pregnancy - diuretics, methyldopa, most others OK
 - preeclampsia - no benefit ASA or calcium
 - HRT is OK with HTN meds (monitor)

Other Considerations

- Elderly
 - SBP better predictor of prognosis
 - elevated pulse pressure good predictor
 - pseudoHTN (vessel stiffness)
 - orthostasis
 - isolated SHTN - use diuretics first
 - goal = 140/90 although 160 “intermediate goal” in systolic HTN

New Factors in HTN

- Endothelial dysfunction
 - endothelium is regulatory
 - EDRF (endothelial derived relaxing factor) causes dilation-releases NO₃
 - damage to endothelium - no dilation response to Epinephrine e.g. in morning
 - lowering LDL increases arterial dilation, not just less obstruction

New Factors in HTN

- Free radicals
 - research suggests damage to endothelium
 - reduce nitric oxide
 - ACE inhibitors also may reduce free radicals

Summary

- Hypertension is common & important
- Stage 1,2,3 and “high normal BP” defined
- Initial evaluation: H&P, CBC, Chem 7, lipids, ECG
- Lifestyle modifications emphasized
- Treatment goal = inexpensive & simple
- Treatment reduces M & M