

Getting Blood Pressure to Goal

Rules of Three:

- 3 drugs**
- 3 months**
- 3 behaviors** (Activity-Diet-Control of Tobacco and Alcohol)
- 3 Partners** (Patient-Family-Provider)

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Conflict of Interest

- Individual Speakers to Add their information prior to presenting

Objectives

1. Discuss the scope and significance of uncontrolled hypertension in U.S.
2. Examine patient and provider factors that contribute to the problem
3. Review current guidelines and BP goals
4. Discuss the Rules of 3 to achieve goal
5. Discuss goal achievement in special populations

Scope of the Problem

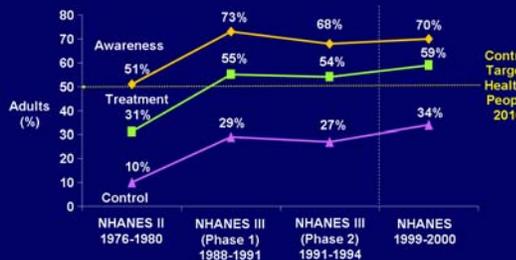
- 1 in 4 Americans - 65 million adults
 - 30% increase from 1988-1994
 - 2/3 are untreated or *under* treated
- Millions uncontrolled
 - 69% - NHANES 1999-2000
 - 71% - Framingham 1990-1995
 - 50-70% - Ambulatory care practices
- High-risk groups with hypertension
 - 88% Diabetics – NHANES III
 - 89% CKD - NHANES III

Majority of US Hypertensive Patients Not at SBP Goal of < 140 mm Hg



SBP = systolic blood pressure
Adapted from Whyte JL, et al. *J Clin Hypertens (Greenwich)*. 2001;3:211-216.

Unacceptable BP Control Rates Require Increased Awareness, More Aggressive Treatment

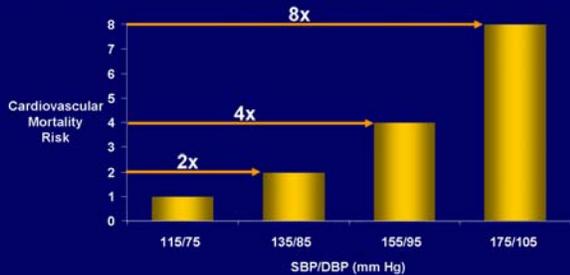


NHANES = National Health and Nutrition Examination Survey. Adapted from Chobanian AV et al. JAMA. 2003;289:2560-2572; Hajjar I, Kotchen TA. JAMA. 2003;290:199-206.

Significance of HBP Problem

- 50% of hypertensives are uncontrolled.
- Up to half are not receiving pharmacologic treatment
- Antihypertensive therapy can
 - ↓ Stroke – 30%
 - ↓ CHF – 40-50%
 - ↓ CAD – 10-20%
 - ↓ CAD Events - ~55%
 - ↓ Mortality – 10%
- ~ \$1 Billion in direct medical costs/year

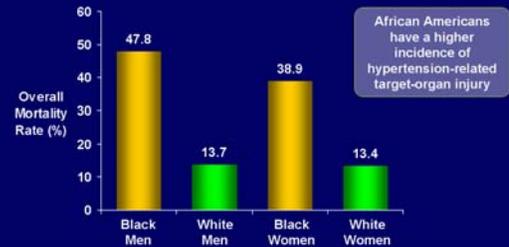
Cardiovascular Mortality Risk Doubles With Each 20/10 mm Hg BP Increment*



SBP = systolic blood pressure; DBP = diastolic blood pressure. *Individuals aged 40-69 years, starting at BP 115/75 mm Hg. Chobanian AV et al. JAMA. 2003;289:2560-2572. Lewington S et al. Lancet. 2002;360:1903-1913.

CV-Related Mortality Rates Are Higher in African Americans

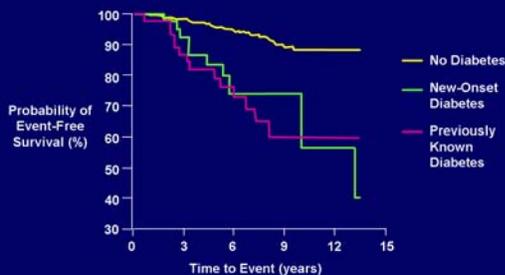
Overall Mortality Rates From Causes Related to Hypertension (2001)*



African Americans have a higher incidence of hypertension-related target-organ injury

*High BP was listed as a primary or contributing cause of death. American Heart Association. 2004.

Cardiovascular Events in Treated Hypertensive Diabetic Patients



Patients with new or prior diabetes were ~ 3 times more likely to have a CV event than those without diabetes. Verdecchia P et al. Hypertension. 2004;43:963-969.

Preventing Kidney Failure

- African Americans in Michigan have poorer blood pressure control than Caucasians
- African Americans are at **five times** greater risk of progression to end stage renal disease
- Better blood pressure control **SLOWS PROGRESSION** of renal disease
- BP control reduces the risk of stroke, MI, and CHF

Factors Contributing to Poor BP Control

Patient Factors

- Age
- Race/ethnicity
- Obesity
- Access
- Non adherence
 - Knowledge
 - Cost
 - Complex treatment
 - Pt/Provider Communication
- Secondary HTN

Provider Factors

- Measurement issues
- Lack of knowledge/ Disagreement with guidelines
- Concern for side effects
- Non-advancing of drugs in asymptomatic patients
- Response to patients concerns over complexity of treatment
- Lack of time

Measurement Accuracy

- **Accuracy of office measurements**
 - Manual – Regularly calibrated
- **White-Coat Syndrome**
- **Home Monitoring**
 - Omron Healthcare Arm (not wrist) monitor
 - Goal readings < 135/85

Measurement Accuracy *

- Patient Position:
 - Back supported
 - Feet on the floor
 - Arm at the level of the heart
 - No talking
- Cuff Size –
 - **Most adults need a large cuff**
(See CD and AHA website for details)
- Take twice
- Check orthostatic blood pressure

* CD provided to support review and standardization of BP measurement

Measurement Accuracy: Orthostatic Hypotension

- 20% prevalence in community dwelling adults over age 65
- Increases with age
- Present in younger patients with diabetes or autonomic dysfunction
- “If orthostasis cannot be corrected, use standing BP to assess goal BP” (JNC-7)

JNC 7: New BP Classifications

BP Level (mm Hg)*		Category
Systolic	Diastolic	
< 120	and < 80	Normal
120-139	or 80-89	Pre-hypertension
140-159	or 90-99	Stage 1 Hypertension
≥ 160	or ≥ 100	Stage 2 Hypertension

*Use higher value for classification
Chobanian AV et al. JAMA. 2003;289:2560-2572.

JNC 7 Recommended BP Goals

- **<140 and <90 mmHg**
 - Patients with most conditions
- **<130 and < 80 mmHg**
 - Diabetes Mellitus
 - CKD
 - Albuminuria >300mg/24 hr or >200mg/g urinary creatinine
 - eGFR <60ml/min/1.73m²
 - Serum creatinine levels alone over estimate kidney function
- Assess and address other cardiovascular risk factors

Chobanian AV et al. JAMA. 2003;289:2560-2572.

JNC 7: Management of Hypertension by BP Classification

BP Classification	Lifestyle Modification	Initial Drug Therapy	
		Without Compelling Indication	With Compelling Indication
Normal < 120/80 mm Hg	Encourage		
Pre-hypertension 120-139/80-89 mm Hg	Yes	No drug indicated	Drug(s) for the compelling indications
Stage 1 hypertension 140-159/90-99 mm Hg	Yes	Thiazide-type diuretics for most; may consider ACE-I, ARB, BB, CCB, or combination therapy as first line	Drug(s) for the compelling indications; other antihypertensive drugs (diuretics, ACE-I, ARB, BB, CCB) as needed
Stage 2 hypertension ≥ 160/100 mm Hg	Yes	2-drug combination as first line for most (usually thiazide-type diuretic and ACE-I, ARB, BB, or CCB)	Drug(s) for the compelling indications; other antihypertensive drugs (diuretics, ACE-I, ARB, BB, CCB) as needed

ACE-I = angiotensin-converting enzyme inhibitor; ARB = angiotensin-receptor blocker; BB = β -blocker; CCB = calcium-channel blocker.
Chobanian AV et al. JAMA. 2003;289:2560-2572.

Common Provider Concerns with Guideline Goals

- Non Acceptance of BP goals
- Resistance to accept SBP thresholds
 - Not treating unless SBP >160mmHg
- Concerns of increased cardiovascular risk with excessive lowering of DBP (J-Curve)
- Believe that more time is needed to reach goal

VALUE, LANCET, 2004;363:2022-2031

Rule of 3 “MDBP”

- 3 Months**
- 3 Drugs**
- 3 Behaviors** (activity-diet-alcohol and tobacco control)
- 3 Partners** (Patient –Family –Provider)

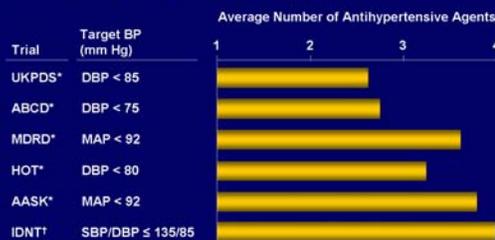
It Might Take 3 Months

- Getting BP to goal in 3 months
 - Requires multiple visits
- Getting to Goal visit schedule:
 - Monthly until goal is reached
 - Increase visit frequency if Stage 2
 - Increase visit frequency with co morbid conditions
- At goal – follow up visit schedule
 - Every 3-6 months depending on co morbidities
 - Check K⁺ and Creatinine 1-2x/ year

Drug Therapy

- Step Approach:
 - Start with diuretic if no contraindications
 - Add ACEI
 - Calcium Channel Blocker (CCB)
 - Beta blockers – but caution
- Most patients require multiple drugs to achieve control (average = 3.5 drugs)
- Use multiple drugs if:
 - BP 20/10 mmHg above goal (Stage 2→2 drugs)
 - Standing BP above goal in patients over age 65 or DM
 - Not at goal after 3 months

Multiple Antihypertensive Agents Are Needed to Achieve Target Blood Pressure



DBP = diastolic blood pressure; MAP = mean arterial pressure
UKPDS = United Kingdom Prospective Diabetes Study; ABCD = Appropriate Blood Pressure Control in Diabetes; MDRD = Modification of Diet in Renal Disease; HOT = Hypertension Optimal Treatment; AASK = African American Intervention Study of Kidney Disease; IDNT = Irbesartan Diabetic Nephropathy Trial
*Bakris GL, et al. Am J Kidney Dis. 2000;36:646-661; †Lewis EJ et al. N Engl J Med. 2001;345:851-860.

Drug Treatment: Diuretics

- If no compelling indications (CHF, diabetes, CKD)
 - **Chlorthalidone** (or other thiazides) **first**
 - Then ACEI or ARB
 - Remember Beta Blockers ARE NOT for primary prevention and are inferior to diuretics as monotherapy
- Vigilantly prevent hypokalemia
 - Spironolactone/HCTZ is a great combination!
 - Bring patients back in one week to check for diuretic induced hypokalemia
- Watch for hyponatremia

Drug Treatment: ACE inhibitors

- Check Electrolytes, BUN, and Creatinine prior to starting
- Recheck K⁺ and Creatinine 1 week after initiation of therapy
- Generic available
 - BID Dosing:
 - enalapril (5 mg bid-20mg bid)
 - captopril (12.5 mg bid-50 mg bid)
 - Daily Dosing
 - lisinopril (5-40 mg daily)
- Side effects:
 - Cough- switch to ARB if affordable
 - Hyperkalemia and acute renal failure
 - Angioedema

What Have We Learned? Treatment

- Treatment of the very elderly decreases stroke and CAD but does not prolong survival (*Lancet*1999;353:793)
- Best drugs in rank order:
 - Chlorthalidone
 - ACE inhibitor
 - HCTZ (*Hypertension* 2004;44:800)
 - CCB

What Have We Learned? Treatment

- ACEI and ARB decrease new onset of diabetes by 25% compared to beta blockers (LIFE); 23% compared to CCBs (VALUE trial)
- New onset of diabetes while undergoing treatment for hypertension confers the same excess CV risk as preexisting diabetes (*Hypertension* (2004) 43 p.963)

What Have We Learned? Treatment

- Monotherapy with atenolol is NOT as efficacious as other antihypertensives for decreasing CV risk despite equivalent BP control (*Lancet*.2004;364:1684)
- Beta blockers are **inferior** to diuretics for blood pressure control and CV risk protection (stroke, CHF) in older patients (MRC trial, 1990; *JAMA* 1998; 279:1903-1907; INVEST: *JAMA* 290:2805-2816; ASCOT Trial)

Combination Treatments

Logical /additive combinations

- Diuretic + ACEI or ARB
- Diuretic + Beta Blocker or sympatholytics
- CCB+ ACEI or ARB
- Diuretic + Beta Blocker + vasodilator

- Diuretic + CCB

Combination Treatments

Combinations with NO additive effect

- Beta Blocker + ACEI
- Vasodilators + CCB

Combination with additive side effects

- Beta Blocker + clonidine or guanfacine
- Beta Blocker+ verapamil or diltiazem
- Clonidine/ guanfacine + verapamil or diltiazem

In difficult to control patients It Takes 3 DRUGS!

Choose a logical ADDITIVE combinations:

- Diuretic + ACEI + CCB
- Diuretic + B Blocker + vasodilator
- Diuretic + clonidine + vasodilator

Special Populations

- **Diabetes**
 - ACEI or ARB
 - Diuretics are important adjunct therapy
 - ↑ BS control associated with ↑ BP control
- **CKD**
 - ACEI or ARB are important to preserve renal function
 - If eGFR < 50 start torsemide or furosemide bid
- **Post MI**
 - Beta blockers
 - ACEI or ARB
 - Check K⁺ and Creatinine prior to initiating and 1 week after initiating ACE

It Might Take 3 Months

○ But if not at goal by 6 months consider:

- Patient reasons for non adherence
- Sleep Apnea
- Alcohol overuse
- Diabetes
- Chronic Kidney Disease
- Secondary causes
- Consult with or refer to Hypertension Specialist

VALUE, LANCET,2004;363:2022-2031

Sleep Apnea

- Up to 60% males with resistant hypertension (also common in postmenopausal females)
- Suspect diagnosis- screen and refer
- Pathophysiology of hypertension likely SNS activation

Lifestyle: It Takes 3 BEHAVIORS

- Exercise
- Diet
- Control of tobacco and alcohol

Lifestyle: Exercise

- 4-9mmHg SBP reduction
- 30-45 minutes/day/5-7days/week
- Aerobic activity (e.g. brisk walking)
- **Write a prescription**

Favorite Patient

Sig 40 minutes of walking 5X/wk

BPMD 3333

Lifestyle: Diet

- **Weight Control**
 - 5-20 mmHg SBP reduction/ 10kg
- **Low Sodium (<2.4 g)**
 - 2-8 mmHg SBP reduction
- **DASH**
 - 8-14 mmHg SBP reduction

Control of Tobacco and Alcohol

- **Smoking Cessation**
 - Write prescription
- **Alcohol Moderation**
 - ≤ 2 alcoholic drinks/day – men
 - ≤ 1 alcoholic drink/day – women
 - 2-4 mmHg reduction in SBP
- **Access for other substances**

Partners: It takes 3 Partners

- Patient
- Family
- Provider

- Provider/Patient Relationship Key

The Patient: Participation is crucial Describe the journey

- "This is a serious disease"
- "I will need to see you every 4-6 weeks"
- "This is **your goal** <140/90 (or 130/80)"
- "**Achieving your goal is important because** it lowers your risk of..."
- **Share goal setting**
 - "Let's set some goals
 - "This how can you help
 - "What are you willing to do?"
 - "We are a team—Patient, provider, "family"
- If we do not achieve your goals...

Partners: Patients

Patient non-adherence to therapy

- Lack of concern if asymptomatic
- Feel "better" with higher BP
- Don't worry about "touch" of high BP
- Mistrust of health care providers and health care system

Improved adherence with

- Increased contact with providers
- Self /home BP measurement- OMRON arm , usually LARGE ADULT cuff (Bladder encircling 80% arm)
- Use of patient record to keep track of influence of factors (e.g. diet) on BP

Partners: “Family”, Friends, Community

- Involve “family” whenever possible
 - Essential for lifestyle modification
- Be familiar with community resources

Partners: Providers

- Follow JNC and MQIC* Guidelines
- Document Goal
 - Schedule frequent visits to get to goal
 - 3 months to goal!!!!
 - Tools to get to goal
 - eGFR slide rule to assess renal function
 - Collaborative practice with APNs improves control

* www.MQIC.org

Provider Steps to Increase Adherence

- Write lifestyle prescriptions
- Consider costs of drugs – generics whenever possible
- Simplify drug regimens
 - Daily therapy or BID
- Address patient’s understanding of the disease and its treatment
- Telephone follow ups
 - increase adherence especially for “no shows”
 - try to keep them in treatment
 - Additional follow up as negotiated with patient
- Office RN or APN will increase BP control (Collaborative Practice)

Key Points from Presentation

- Measurement Accuracy is important
- **Determine Goal BP**
 - <140/90 <130/80 DM CKD
- **Follow guidelines**
- **Rules of 3 (MDBP)**
 - 3 Months
 - 3 Drugs
 - 3 Behaviors
 - 3 Partners

Handouts

- Information contained on CD
 - Tonight’s slide presentation – share with colleagues
 - BP measurement protocol
 - MQIC guidelines
 - NHLBI DASH diet information
 - Patient Health Record
 - Prescription pads for exercise/lifestyle prescriptions

Questions?
Cases you’d like to discuss?