# Blood Pressure Goals: The Bar Keeps Changing

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## Disclosures

- Janene Marshall has no relevant financial relationships to disclose.
- Antoine Jenkins has no relevant financial relationships to disclose.

## Pharmacist Objectives

At the conclusion of this knowledge-based continuing pharmacy education activity, pharmacist participants should be able to:

1. Discuss the clinical literature for hypertension goals and management.
2. Describe specific patient populations that may benefit from stricter blood pressure goals.
3. Describe specific patient populations that may benefit from more conservative blood pressure goals.
4. Review data from nationally published guidelines and clinical trials to design a therapy plan for a hypertensive patient.

## Pharmacy Technician Objectives

At the conclusion of this knowledge-based continuing pharmacy education activity, pharmacy technician participants should be able to:

1. Describe the goals of hypertension management.
2. Describe specific patient populations that may benefit from stricter blood pressure goals.
3. Describe specific patient populations that may benefit from more conservative blood pressure goals.
4. List 5 of the most commonly used medications for the management of hypertension.

## Hypertension Epidemiology

- Well known risk factor for the development of CV disease and stroke.
- Most common and preventable condition in primary care
- In the U.S., about 77.9 million (adults have high blood pressure.
- Data from NHANES 2007–10 showed that of those with high blood pressure,
  - 81.5 percent are aware they have it
  - 74.9 percent are under current treatment
  - 52.5 percent have it controlled
  - 47.5 percent do not have it controlled
- Multiple stakeholders have voiced commentary regarding suitable BP goals.

American Heart Association. http://www.heart.org/idc/groups/heart-public/@wcm/@sop/@smd/documents/downloadable/ucm_319587.pdf. Accessed July 10, 2014
*Lancet*. 2005;365:217–223.
http://www.cdc.gov/nchs/datadatabriefs/db200.htm. Accessed Jun 14, 2016.

## Hypertension Epidemiology

- Hypertensive Adults
  - 75% use antihypertensive medications
  - 53% are adequately controlled
- If untreated, can lead to myocardial infarction (MI), stroke, renal failure, or death
- Lowest risk of events at BP ~115/75
  - For each increase by 20mmHg SBP or 10mmHg DBP, risk of CV or stroke events double

1. American Heart Association. http://www.heart.org/idc/groups/heart-public/@wcm/@sop/@smd/documents/downloadable/ucm_319587.pdf. Accessed July 10, 2014.
2. *Hypertension. 2003;42:1206*

## Prevalence by Age Group and Gender

| Age | Men (%) | Women (%) |
|---|---|---|
| **20-34** | 11.1 | 6.8 |
| **35-44** | 25.1 | 19.0 |
| **45-54** | 37.1 | 35.2 |
| **55-64** | 54.0 | 53.3 |
| **65-74** | 64.0 | 69.3 |
| **75 and older** | 66.7 | 78.5 |
| **All** | 34.1 | 32.7 |

*Circulation*. 2013;127:e6–245.

## Prevalence by Ethnic Group

| Race of Ethnic Group | Men (%) | Women (%) |
|---|---|---|
| **African Americans** | 43.0 | 45.7 |
| **Mexican Americans** | 27.8 | 28.9 |
| **Whites** | 33.9 | 31.3 |
| **All** | 34.1 | 32.7 |

*Circulation*. 2013;127:e6–245.

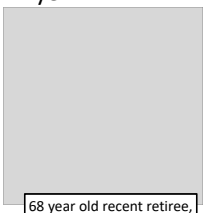
## Economic Burden of Hypertension

- The estimated direct and indirect cost of high blood pressure in 2009 is $51.0 billion
- Per the American Heart association
  - $42.7 Billion dollars in direct health expenditures
  - In 2030 projected total costs for hypertension will be $274 billion dollars

1. *Circulation*. 2015;131:e29-e322.
2. http://www.heart.org/idc/groups/heart-public/@wcm/@hsg/@smd/documents/downloadable/ucm_319587.pdf. Accessed July 10, 2014.

## Patients for Discussion

- Mr. Hye BP
- Mrs. Harriet Touissant



68 year old recent retiree, excited to finally travel

67 year old proud grandmother of 3

## **Mr**. Hye BP

Presents to clinic for a wellness physical. At a recent health fair sponsored by ICHP one month ago, his blood pressure was 155/90 mm Hg (upon repeat 160/95 mm Hg). He his complaint with his medication regimen. He has been attempting to lower the sodium in his diet and to increase physical activity by walking around his neighborhood.

PMH: Stage 3 CKD, HTN X 50 yrs, CAD glaucoma, GERD, and dyslipidemia X 30 yrs
Vitals: BP 154/86 mmHg (similar upon repeat) , HR 75 bpm.
Labs: Electrolytes WNL, but SCr 2.2 mg/dL. UAE: 150mg/day

Which BP goal would be the most initial suitable for Mr. Hye BP?

A) < 150/90 mm Hg
B) < 130/80 mm Hg
C) <140/90 mm Hg
D) SBP < 120 mm Hg

## **Mrs. Harriet Toussaint**

Presents to clinic for a for a follow up visit. At a recent health fair sponsored by ICHP one months ago, her blood pressure was 158/95 mm Hg. She had already been recently diagnosed with hypertension. She has no family history of heart disease or diabetes. No other comorbidities. NKDA.

Vitals (10/06/16): BP 156/90 mmHg (similar upon repeat) , HR 86 bpm.

Which BP goal would be the most initial suitable for Mrs. Toussaint?

A. <150/90
B. <140/90
C. <140/80
D. <130/80

## Back in the Day: Remembering JNC 7

| Classification and Management of BP for adults | | | | | |
|---|---|---|---|---|---|
| BP classification | SBP mmHg | DBP mmHg | Lifestyle modification | Initial drug therapy | |
| | | | | Without compelling indication | With compelling indications |
| Normal | <120 | and <80 | Encourage | | |
| Prehypertension | 120–139 | or 80–89 | Yes | No antihypertensive drug indicated. | Drug(s) for compelling indications. |
| Stage 1 Hypertension | 140–159 | or 90–99 | Yes | Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination. | |
| Stage 2 Hypertension | ≥160 | or ≥100 | Yes | Two-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB). | Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed. |

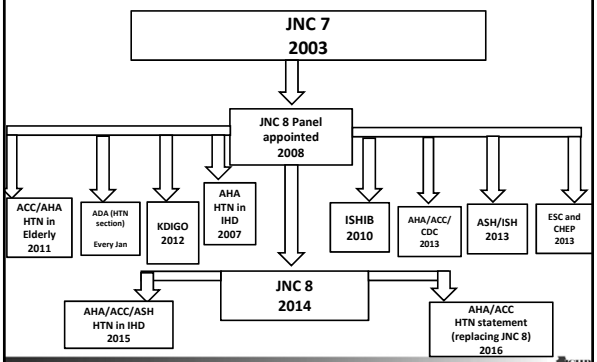
*Hypertension. 2003;42:1206.*

## Back in the Day: Remembering JNC 7

| Compelling Indications for Individual Drug Classes | | |
|---|---|---|
| Compelling Indication | Initial Therapy Options | Clinical Trial Basis |
| Heart failure | THIAZ, BB, ACEI, ARB, ALDO ANT | MERIT-HF, COPERNICUS, CIBIS, SOLVD, AIRE, TRACE, ValHEFT, RALES |
| Postmyocardial infarction | BB, ACEI, ALDO ANT | BHAT, SAVE, Capricorn, EPHESUS |
| High Risk CAD | THIAZ, BB, ACEI, CCB | ALLHAT, HOPE<br>ANBP2, LIFE, CONVINCE |
| Diabetes | THIAZ, BB, ACEI, ARB, CCB | UKPDS, ALLHAT |
| Chronic Kidney Disease | ACEI, ARB | RENAAL, IDNT, REIN, AASK |
| Recurrent Stroke | THIAZ, ACEI | PROGRESS |

*Hypertension. 2003;42:1206.*

## HTN Guidelines…Over the Years




## 2013- Extra! Extra!


- June 19, 2013, NHLBI explained that the evidence review and guideline development process has been changed.
- NHLBI opted to publish five "integrated cardiovascular guideline products" as “evidentiary reviews “
- Will collaborate with other organizations to prepare and issue the related clinical-practice guidelines
- The five CV "guideline products" include cholesterol, blood pressure, risk assessment, lifestyle interventions, and obesity.

NIH Says ATP 4, JNC 8 Guidance Out 'in a Matter of Months' (With a Twist). *Medscape*. Jun 19, 2013.

## 2014 Evidenced-Based Guideline for the management of High Blood Pressure in Adults from the panel members appointed to the 8th Joint National Committee- JNC-8

| Guideline | Population | Goal BP (mmHg) | Initial Drug Treatment Options |
|---|---|---|---|
| JNC 8 | ≥60yo | <150/90 | Non-Black: thiazide, ACEI/ARB, or CCB<br>Black: Thiazide or CCB<br>Thiazide, ACEI/ARB, or CCB<br>ACEI/ARB |
| | <60yo | <140/90 | |
| | Diabetes | <140/90 | |
| | CKD | <140/90 | |

JAMA. 2014;311:507-520.

## ALLHAT subgroup

| | ALLHAT 2002 |
|---|---|
| Study Design | Randomized, double blind |
| Population | ≥55yo, HTN, ≥1 CHD risk factor |
| Treatment Goal | <140/90 |
| Treatment Drugs | Chlorthalidone, amlodipine, lisinopril |
| BP in study (mmHg) | Chlorthalidone: 134/75<br>Amlodipine: 135/75<br>Lisinopril: 136/75 |
| F/U | 5yrs |
| Significant Outcomes (Black subgroup, ACEI vs. Thiazide) | Stroke: RR, 1.40 (CI 1.17-1.68)<br>HF: RR 1.32 (CI 1.11-1.58)<br>Combined CHD: RR 1.15 (CI 1.02-1.30)<br>Combined CVD: RR 1.19 (CI 1.09-1.30) |
| Significant Outcomes (Black subgroup, CCB vs. Thiazide) | HF: RR 1.47 (CI 1.24-1.74)<br>No difference in other outcomes |

## Other antihypertensive classes

- Alpha Blocker not first-line
  - Worsen cerebrovascular, HF, and combined CV outcomes vs diuretic
- No randomized clinical trials to support the following agents as first line
  - Non-selective beta blockers
  - Vasodilating beta blockers
  - Central alpha-2 agonists
  - Direct vasodilators
  - Aldosterone antagonists
  - Loop diuretics

## "Minority" group concerns

- Lack of evidence, especially for high risk groups
- Reduces intensity in patients already being treated
- Inconsistent with evidence used in other recommendations for SBP<140
- May reverse decades of declining CVD rates, especially for stroke
- Evidence that supports lower goal not reviewed due to inclusion criteria of the review

. Ann Intern Med. 2014; 160(7): 499-503.

## Critique of the JNC 8 guidelines

- American Society of Hypertension and the International Society of Hypertension released their own guidelines
- Out of nine recommendations by the committee, only two were rated as "Strong" based on the clinical literature
- Two recommendations were Moderate, one was weak, the rest were "Expert Opinion"

## Critique of the JNC 8 guidelines

- Increasing SBP goal in those ≥60yo will reduce the intensity of antihypertensive treatment amongst patients already being treated
  - Large majority with established CVD or high risk for CVD
- Raising the target may have unintended effect of reversing the decades of declining CVD rates, especially stroke mortality.

## JNC 7 vs JNC 8 comparison

| Guideline | Population | Goal BP (mmHg) | Initial Drug Treatment Options |
|---|---|---|---|
| JNC 7 | No Compelling Indications | <140/90 | Thiazide (most patients) ACEI/ARB, Beta blocker, CCB or combination |
| | Compelling Indications | <130/80 | Diabetes: 1st line ACEI/ARB, 2nd line- thiazide, 3rd, Beta blocker or CCB |
| JNC 8 | ≥60yo | <150/90 | Non-Black: thiazide, ACEI, ARB, or CCB |
| | <60yo | <140/90 | Black: Thiazide or CCB |
| | Diabetes | <140/90 | Thiazide, ACEI/ARB, or CCB |
| | CKD | <140/90 | ACEI/ARB |

**International Society of Hypertension Clinical practice Guidelines**

**ATP-4**

**Heart Failure**

**Diabetes**

**American Society of Hypertension**

**Atrial Fibrillation**

**JNC-8**

**EUROPEAN SOCIETY OF HYPERTENSION**

## Comparison of BP Goals Across Guidelines

## Comparison of BP Goals Across Guidelines

| Guideline Comparison of Blood Pressure Goals (BP in mmHg) | | |
|---|---|---|
| **Organization** | **Uncomplicated HTN** | **Older Adults** |
| 2003 JNC 7 | <140/90 | No recommendation |
| 2010 ISHIB | <135/85 or <130/80 | No recommendation |
| 2011 ACC/AHA Expert Consensus | <140/90 (ages 55-79) | SBP 140-145 if tolerable ages ≥ 80 yrs. SBP ≥ 150 acceptable for some. |
| 2013 ASH/ISH | <140/90 | <150/90 ages ≥ 80 yrs |
| 2014 JNC 8 | <140/90 | <150/90 ages ≥ 60 yrs |
| 2013 ESH/ESC | <140/90 | <150/90 ages ≥ 80 yrs |
| 2013 CHEP | | |

*JAMA* 2014;311:507-20. *J Hypertens* 2013;31:1281-357. *Can J Cardiol* 2013;29:528-42. *Hypertension* 2003;42:1206-52. *Hypertension*. 2010;56:780-800. *Circulation*. 2011;123:2434-2506 *J Clin Hypertens* 2014;16:14-26.

## Guideline Comparisons

| Guideline | Population | Goal BP (mmHg) | Initial Drug Treatment Options |
|---|---|---|---|
| ASH/ISH | <80yo<br>≥80yo<br><br><br><br>Diabetes | <140/90<br><150/90<br><br><br><br><140/90 | Non-black (<60yo): ACEI/ARB<br>Non-black (≥60): CCB or thiazide (may consider ACEI/ARB)<br><br>Black (all ages): CCB or thiazide<br>CAD: B-blocker + ACEI/ARB<br>Stroke: ACEI/ARB<br>HF: ACEI/ARB +BOblocker +diuretic + aldosterone antagonist |
| AHA/ACC/CDC | General population | <140/90 | CAD/Post MI: B-blocker, ACEI<br>Systolic HF: ACEI/ARB, B-blocker aldosterone antagonist, thiazide<br>Diastolic HF: ACEI/ARB, B-blocker, thiazide<br>Diabetes: ACEI/ARB, thiazide, B-blocker, CCB<br>CKD: ACEI/ARB<br>Stroke/TIA: thiazide or ACEI |

## Question

- According to JNC 8, a BP goal of <150/90 would be appropriate for which patient?

A. 57yo WM with BP 164/96
B. 65 yo WF with BP 152/86 and CKD
C. 75yo AAM with BP 145/85
D. 85yo AAF with BP 133/75 and diabetes

## Patient Case

- According to JNC 8, what would be your preferred BP goal?

A. <150/90
B. <140/90
C. <140/80
D. <130/80

## BP Goals: Landmark Research Studies

**HYVET**

***(Hypertension in the Very Elderly)***

**3845 patients ≥80 yrs old with SBP ≥ 160 mmHg**

***(Mean age 83 yrs, Mean BP 173/90 mmHg, 12% CVD, 7% DM, no enrollees from North America)***

**1933 patients Indapamide ± perindopril**

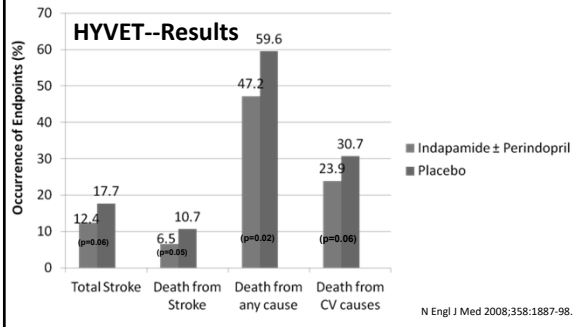
**BP Target <150/80 mm Hg**

**1912 patients Placebo**

**Primary Outcomes: Total strokes**
**Secondary Outcomes: Death from stroke, death from any cause, death CV causes**

N Engl J Med 2008;358:1887-98.

## BP Goals: Landmark Research Studies




N Engl J Med 2008;358:1887-98.

## BP Goals: Landmark Research Studies

**ACCORD-BP**

***(Action to Control Cardiovascular Risk in Diabetes)***

4733 patients with high CV risk Type II DM

***(Mean age 62 yrs, Mean BP 139/76 mmHg, Mean $A_1C$ 8.3%, Mean LDL 110 mg/dL)***

**2362 patients Intensive BP lowering group**

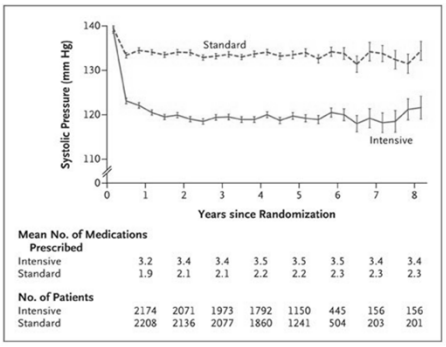
**2371 patients Conservative BP lowering group**

**Primary Outcomes: Mortality from CV causes, nonfatal stroke, nonfatal MI**

**Secondary Outcomes: Above plus multiple others**

N Engl J Med 2010;362:1575-85.

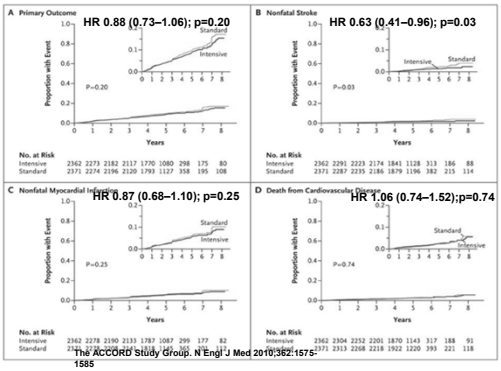
## BP Goals: Landmark Research Studies




| Mean No. of Medications Prescribed | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Intensive | 3.2 | 3.4 | 3.4 | 3.5 | 3.5 | 3.5 | 3.4 | 3.4 |
| Standard | 1.9 | 2.1 | 2.1 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 |
| **No. of Patients** | | | | | | | | |
| Intensive | 2174 | 2071 | 1973 | 1792 | 1150 | 445 | 156 | 156 |
| Standard | 2208 | 2136 | 2077 | 1860 | 1241 | 504 | 203 | 201 |

N Engl J Med 2010; 362:1575-85.

## BP Goals: Landmark Research Studies




The ACCORD Study Group. N Engl J Med 2010;362:1575-1585

N Engl J Med 2010; 362:1575-85.

## BP Goals: Landmark Research Studies

**SPRINT**

***(Systolic Blood Pressure Intervention Trial)***

***9361 individuals ≥ 50 yrs with at least one CV risk factor (excluding diabetes) or renal disease***

**4678 patients Intensive BP goal (SBP < 120 mmHg)**

**4673 patients Standard BP goal (SBP < 140 mmHg)**

**Primary Endpoints: Myocardial infarction (MI), acute coronary syndrome (not resulting in MI), stroke, heart failure, mortality from cardiovascular causes**

*N Engl J Med* 2015;373:2103-16.

## BP Goals: Landmark Research Studies

| SPRINT Results | | | |
|---|---|---|---|
| **Endpoints** | **Intensive Treatment** | **Standard Treatment** | **Hazard Ratio (95% CI) [p-value]** |
| **Primary Outcome** | 5.2% | 6.8% | 0.75 (0.64–0.89) [p<0.001] |
| **Heart Failure** | 1.3% | 2.1% | 0.62 (0.45–0.84) [p=0.002] |
| **Mortality from CV causes** | 0.8% | 1.4% | 0.57 (0.38–0.85) [p=0.005] |
| **Mortality from all causes** | 3.3% | 4.5% | 0.73 (0.60–0.90) [p=0.003] |

*N Engl J Med* 2015;373:2103-16.

## BP Goals: Landmark Research Studies

| SPRINT Results (Safety) | | | |
|---|---|---|---|
| **Adverse Effects** | **Intensive Treatment** | **Standard Treatment** | **p-value** |
| Hypotension | 2.4% | 1.4% | 0.001 |
| Electrolyte abnormalities | 3.1% | 2.3% | 0.02 |
| Acute renal failure | 4.1% | 2.5% | <0.001 |
| Fall risk | 2.2% | 2.3% | 0.71 |

*N Engl J Med* 2015;373;2103-16.

## BP Goals: Landmark Research Studies

| Comparison of ACCORD-BP and SPRINT Studies | | |
|---|---|---|
| **Characteristic** | **ACCORD-BP (n=4733)** | **SPRINT (n=9361)** |
| Patients | All with DM either with CV disease or had at least 2 risk factors for CV disease. (mean BP: 139/76 mmHg) | SBP ≥ 130 mmHg plus one CV risk factor or renal disease (no DM). (mean BP: 139/78 mmHg) |
| Primary Endpoints | Composite of nonfatal stroke, MI, death from CV causes | MI, ACS (not resulting in MI), stroke, HF, mortality from CV causes |
| Mean BP after first year | Intensive group: 119/64 mmHg<br>Standard group: 134/71 mmHg | Intensive group: 121/68 mmHg<br>Standard group: 136/76 mmHg |
| Results | No difference in annual rate between groups: 1.87% vs. 2.09%. (HR 0.88; 0.73-1.06; p = 0.20). | Significantly lower annual rate noted in intensive group vs. standard 1.65% vs. 2.19%; HR 0.75; CI, 0.64–0.89; p<0.001). |

BP=Blood Pressure DM=Diabetes mellitus
CV=Cardiovascular HF= Heart Failure
MI=Myocardial Infarction
ACS=Acute Coronary Syndrome

*N Engl J Med* 2010;362:1575-85.
*N Engl J Med* 2015;373;2103-16.

## BP Goals: Landmark Research Studies

- ACCORD-BP vs. SPRINT
  - Other Differences
    - Greater statistical power in SPRINT
    - Greater number of endpoints within the primary outcome that were more receptive to BP reduction in SPRINT
    - Difference in stroke noted in ACCORD and not SPRINT

*N Engl J Med* 2010;362:1575-85.
*N Engl J Med* 2015;373;2103-16.

## **BP Goals**: Applying Literature to Real World Practice

| Factors in Determining Blood Pressure Goals for Daily Practice | | |
|---|---|---|
| **Aggressive Goals (<135/85 mmHg, <130/80 mmHg, or SBP <120 mmHg)** | **Standard Goal (<140/90 mmHg)** | **Conservative Goals (SBP 140-145 mmHg, <150/90 mmHg, or SBP ≥ 150 mmHg)** |
| *Younger Patients (age <65 years old)<br>*Minimal comorbidities<br>*African-American patients<br>*Presence of renal disease with proteinuria or CVD<br>* Older patients (age ≥ 65 yrs old) who demonstrates tolerability | *Most healthy patients<br>*Diabetics | *Older individuals (age ≥ 65 years old)<br>*Multiple comorbidities (frailty, orthostasis)<br>*Limited life expectancy<br>*High sensitivity to adverse effects from antihypertensive agents<br>*Any individual who demonstrates intolerability to intensive treatment |

## Back to **Mr**. Hye BP…

Presents to clinic for a wellness physical. At a recent health fair sponsored by ICHP one month ago, his blood pressure was 155/90 mm Hg (upon repeat 160/95 mm Hg). He his complaint with his medication regimen. He has been attempting to lower the sodium in his diet and to increase physical activity by walking around his neighborhood.

PMH: Stage 3 CKD, HTN X 50 yrs, CAD glaucoma, GERD, and dyslipidemia X 30 yrs
Vitals: BP 154/86 mmHg (similar upon repeat) , HR 75 bpm.
Labs: Electrolytes WNL, but SCr 2.2 mg/dL. UAE: 150mg/day

Which BP goal would be the most initial suitable for Mr. Hye BP?

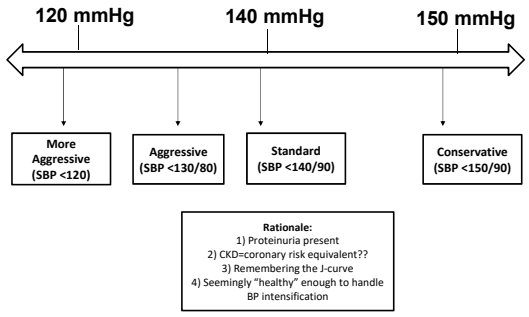
A) < 150/90 mm Hg
B) < 130/80 mm Hg
C) <140/90 mm Hg
D) SBP < 120 mm Hg

## Mr. Hye BP: Comparison of BP Goals Across Guidelines

| Blood Pressure Goals for Mr. Hye BP (BP in mmHg) | | | |
|---|---|---|---|
| **Organization (Year Published)** | **Cardiovascular Disease** | **Chronic Kidney Disease** | **Older Adults** |
| JNC 7 (2003) | <140/90 | <130/80 | ---- |
| JNC 8 (2014) | ---- | <140/90 | <150/90 ages ≥ 60 yrs |
| ASH/ISH (2013) | <140/90 | <140/90 | <150/90 ages ≥ 80 yrs |
| ACC/AHA Expert Consensus (2013) | No clear stance | No clear stance | SBP 140-145 if tolerable ages ≥ 80 yrs. SBP ≥ 150 acceptable for some. |
| KDIGO (2012) | --- | <140/90; if proteinuria present <130/80 | ---- |
| ACC/AHA Treatment of HTN CAD (2015) | <140/90; if ≥ 80 yrs old, then <150/90; <130/80 for higher risk patients | ---- | |
| ESH/ESC (2013) | <140/90 | <140/90 | <150/90 ages ≥ 80 yrs |
| CHEP (2013) | <140/90 | <140/90 | <150/90 ages ≥ 80 yrs |

*J Clin Hypertens* 2014;16:14-26. *JAMA* 2014;311:507-20. *J Hypertens* 2013;31:1281-357. *Hypertension* 2003;42:1206-52. *Hypertension*. 2010;56:780-800. *Circulation*. 2011;123:2434-2506 *Can J Cardiol* 2013;29:528-42. *Kidney Int Suppl* 2012;2:337-414.

## Mr. Hye BP: Determining an Initial Goal




## Back to Mrs. Toussaint

Presents to clinic for a for a follow up visit. At a recent health fair sponsored by ICHP one months ago, her blood pressure was 158/95 mm Hg. She had already been recently diagnosed with hypertension. She has no family history of heart disease or diabetes. No other comorbidities. NKDA.

Vitals (10/06/16): BP 156/90 mmHg (similar upon repeat) , HR 86 bpm.

Which BP goal would be the most initial suitable for Mrs. Toussaint?

A. <150/90
B. <140/90
C. <140/80
D. <130/80

## Mr. Touissant: Comparison of BP Goals Across Guidelines

| Blood Pressure Goals for Mrs. Touissant (BP in mmHg) | | |
|---|---|---|
| **Organization (Year Published)** | **Uncomplicated HTN** | **Older Adults** |
| JNC 7 (2003) | <140/90 | ----- |
| JNC 8 (2014) | <140/90 | <150/90 ages ≥ 60 yrs |
| ISHIB (2010) | <135/85 | ----- |
| ASH/ISH (2013) | <140/90 | <150/90 ages ≥ 80 yrs |
| ACC/AHA Expert Consensus (2011) | <140/90 (ages 55-79) | SBP 140-145 if tolerable ages ≥ 80 yrs. SBP ≥ 150 acceptable for some. |
| ESH/ESC (2013) | <140/90 | <150/90 ages ≥ 80 yrs |
| CHEP (2013) | <140/90 | <150/90 ages ≥ 80 yrs |

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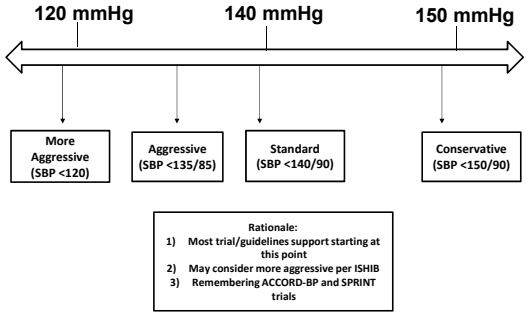
*Can J Cardiol* 2013;29:528-42.

## Mrs. Toussaint: Determining an Initial Goal




## Patient Case

- Which is the best first line treatment option?

A. chlorthalidone
B. lisinopril
C. amlodipine
D. Any of the Above
E. A or C

## Patient Case

- One month later, Harriet returns to your clinic. She was started on amlodipine 5mg po daily. BP today is 138/88mm Hg.
- She is also newly diagnosed with diabetes at this visit. According to the clinical literature what is the next step in your treatment plan?

A. She is already at goal
B. Increase amlodipine
C. Add HCTZ
D. Switch to losartan

## Mr. Touissant: Comparison of BP Goals Across Guidelines

| Blood Pressure Goals for Mrs. Touissant (BP in mmHg) | | |
|---|---|---|
| **Organization (Year Published)** | **Diabetes** | **Older Adults** |
| JNC 7 (2003) | <130/80 | ----- |
| JNC 8 (2014) | <140/90 | <150/90 ages ≥ 60 yrs |
| ISHIB (2010) | <130/80 | ----- |
| ASH/ISH (2013) | <140/90 | <150/90 ages ≥ 80 yrs |
| ADA 2016 | <140/90 or <130/80 | ---- |
| ACC/AHA Expert Consensus (2011) | <140/90 (ages 55-79) | SBP 140-145 if tolerable ages ≥ 80 yrs. SBP ≥ 150 acceptable for some. |
| ESH/ESC (2013) | <140/90 | <150/90 ages ≥ 80 yrs |
| CHEP (2013) | <130/80 | <150/90 ages ≥ 80 yrs |

*J Clin Hypertens* 2014;16:14-26.
*JAMA* 2014;311:507-20.
*J Hypertens* 2013;31:1281-357.
*Hypertension* 2003;42:1206-52.
*Hypertension*. 2010;56:780-800.
*Circulation.* 2011;123:2434-2506
*Can J Cardiol* 2013;29:528-42.
*Diabetes Care* 2016;39(Suppl. 1): S60–S71

## Conclusions

- Management is becoming more "_____".
- Individualized approaches to management maybe best.
  - BP goals may change depending on patient
  - Shared decision making

## Questions?

Thank you!!

## Blood Pressure Goals: The Bar Keeps Changing

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**Self-Assessment Questions**

1. According to JNC 8, a BP goal of <150/90 would be appropriate for which patient?
   A. 57yo WM with BP 164/96
   B. 65 yo WF with BP 152/86 and CKD
   C. 75yo AAM with BP 145/85
   D. 85yo AAF with BP 133/75 and diabetes

2. According to JNC 8, what would be your preferred BP goal?
   A. <150/90
   B. <140/90
   C. <140/80
   D. <130/80

3. Which BP goal would be the most initial suitable for Mr. Hye BP?
   A. < 150/90 mm Hg
   B. < 130/80 mm Hg
   C. <140/90 mm Hg
   D. SBP < 120 mm Hg

4. Which BP goal would be the most initial suitable for Mrs. Toussaint?
   A. <150/90
   B. <140/90
   C. <140/80
   D. <130/80

5. Which is the best first line treatment option for Mrs. Toussaint?
   A. chlorthalidone
   B. lisinopril
   C. amlodipine
   D. Any of the Above
   E. A or C

6. Harriet returns to clinic one month later, she was started on amlodipine 5mg po daily. BP is 138/88. She is also newly diagnosed with diabetes mellitus. According to the literature, what is the next step?
   A. She is already at goal
   B. Increase amlodipine
   C. Add HCTZ
   D. Switch to losartan
   E.
7. Which medication is NOT a common drug used to treat hypertension?
   A. Hydrocholorothiazide
   B. Lisinopril
   C. Amoxicillin
   D. Amlodipine
   E. metoprolol

## Save – Important Information

### Continuing Pharmacy Education (CPE) Program Instructions to Process Credit

**CPE Program:** **Blood Pressure Goals: The Bar Keeps Changing**

**Program Date:** **October 6, 2016**

**Access Code: _____**
***Announced at the session. You will need this to process your credit.***

**CPE Processing Deadlines:**
**October 6 – You MUST complete your evaluation submission by end of day November 19, 2016.**

**Please honor the deadlines! Do NOT Delay in completing your CPE processing. If you encounter problems, we will need time to assist you before the deadline. Once the CPE Monitor deadline passes we are unable to upload your CPE credit into the CPE Monitor system due to the system restrictions put in place by ACPE and NABP. If you miss the deadline you will NOT receive credit for this program!**

Sign In Sheets: Please be sure and fill in the Attendance Sheet to confirm your presence for our records. Attendance sheets will be emailed or faxed to the ICHP office for the ACPE file. ACPE requires we confirm that live attendance matches those processing online CPE credit.

### Detailed instructions to complete evaluations online:

Participants in this CPE program - You will need your own account on **CESally.com** as an ICHP association member in order to access the CPE program, do the evaluation, and submit for credit. This NISHP CPE is free to ICHP members. Non-members please contact ICHP to request CE.

***Only ICHP members who have accepted the association invitation from ICHP via CESally and created an account will be able to SEE and access ICHP member programs. For information on how to REQUEST and / or ACCEPT the members' invitation please go to the new link:***
http://www.ichpnet.org/pharmacy_practice/cesally/.

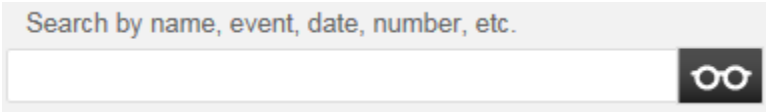
**To set up your account:**
1. Go to www.CESally.com and click on "Sign Up!" Or log in with your existing account. Go to your Account page and accept the association invitation in the right side column, if you have not already done so.
Or REQUEST an invitation to join ICHP on this Account page.
***Note: You must use the same email that received the invitation to log in!***
**Important: You will need to maintain a valid email address.**

2. Select a username and password and complete the Sign Up process. For HELP at any point, click on the HELP tab or go to: https://www.cesally.com/help/.

- Enter your NABP eProfile ID and birth day as MMDD when prompted. CESally.com now checks with NABP/CPE Monitor in real time, to confirm the NABP eProfile and birth day are a valid account.

3. Once you have created your account, or logged in, use the Search Box in the upper right corner to find your activity by typing in the title. You have several options for completing or saving for later.

*NOTE: If the title does not appear to you that may mean you are not logged in as an ICHP association member and / or have not requested / accepted the ICHP invitation.*



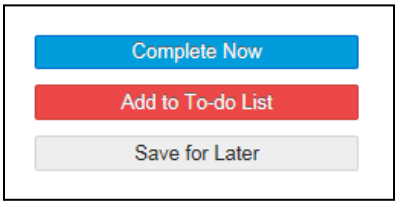

**Please pay CLOSE attention to the Title, Date, and if it says Pharmacist or Technician after the title.**

## Save – Important Information

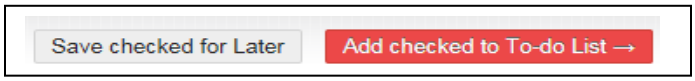
- **Pharmacists must do P-specific programs only.**
- **Technicians must do T-specific programs ONLY for PTCB recertification.**

4. Identify the program attended and choose between a) or b) below:

a) Click on that Activity title to open the information page, and you will see your options in the right hand column on the information page.




b) OR Click on the checkbox inside the small information box, then go to the bottom of the page and see your options there.




5. To finish the process after choosing to **Complete Now**, **Save for Later**, OR **ADD to To-do List.**

a) If you choose **Complete Now**, follow the actions as directed on the webpage. You will verify your attendance, provide the session ACCESS code given to you during the program, and complete an evaluation of the activity and the speaker(s). The status box indicates where you are in the process.

b) If you **Save for Later** or **Add to To-do List**, when you are ready to complete, please go to the appropriate webpage and click on **Start To-do List.** Follow the actions as directed on the webpage. You will verify your attendance, provide the session ACCESS code given to you during the program, and complete an evaluation of the activity and the speaker(s). The status box indicates where you are in the process.

6. Click **Go To Next Step** at the bottom of the page, as you finalize each step in the process.

7. Click on **Report CE**. Your CPE credit will be uploaded to CPE Monitor automatically upon **successful** completion and **submission** of your evaluation.

8. If an error occurs, the system will tell you on the screen so please wait for any error messages. CPE Monitor will not accept your submission if there are any errors, and your credit will NOT be reported to CPE Monitor. ***Please confirm your submissions.***

9. Go to www.NABP.net and CLICK on the CPE Monitor link to log into your personal CPE Monitor account to download an official statement of credit or full transcript.

If you have any questions, please contact ICHP at members@ichpnet.org.

**Please remember the ICHP processing deadline is by end of day November 19, 2016.**

***Thank you!***