

Hypertension Madness: Interpreting guidelines and implementing new techniques

Anna Cosyleon, MD

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Disclosures:

None

Learning Objectives

How to apply and explain HTN Guidelines to your patients

How to implement a standardized blood pressure measurement techniques with your staff

Integrating use of home and ambulatory BP monitoring in your HTN management

Hypertension prevalence;

33.2% of U.S. adults
over age 20 have
hypertension

1. Content source: [National Center for Chronic Disease Prevention and Health Promotion](#) , [Division for Heart Disease and Stroke Prevention](#)

To treat or not to treat?

Mrs. May is a 65 y/o female with history of diabetes and hyperlipidemia, c/o tension headaches x 2 months. Home BP readings consistently 150s/90s

She has been successfully losing weight by diet x1 mo and plans to retire soon and devote time to healthier lifestyle

Medications; atorvastatin 40mg daily

A1c = 6.7% , LDL = 70

Clinic BP is 132/82, patient's cuff during the visit measures 135/81

ARS; To treat or not to treat?

1. No, clinic BP is fine
2. No, not yet, give lifestyle a chance
3. Yes, systolic BP goal is less than 130
4. Yes, Home BPs are elevated

VA cooperative study phase 1–1967

First Randomized controlled trial of hypertension treatment anywhere in the world. Truly ground breaking study.

NIH and JNC

American Journal of Hypertension, Volume 27, Issue 6, 1 June 2014, Pages 765–772,
<https://doi.org/10.1093/ajh/hpt298>

<https://www.ahajournals.org/doi/pdf/10.1161/CIRCULATIONAHA.113.004587>

End of JNC for Hypertension

2014-Despite 5 years in preparation, NIH did not release a JNC 8 report and made the decision to withdraw from issuing guidelines.

JNC 7 - the last official NHLBI HTN Guideline

Goal

- BP <140/90 for Dx and treatment
- <130/80 in patients with diabetes or CKD

But what is JNC 8?

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<https://www.acc.org/latest-in-cardiology/ten-points-to-remember/2017/11/09/11/41/2017-guideline-for-high-blood-pressure-in-adults>

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A word (or two) about Sprint

RCT- Intensive(<120) vs standard (<140) BP Control

9361 participants randomized

BP monitored monthly for 3 months and every 3 months thereafter
(additional visits could be scheduled)

Antihypertensive medication titration decisions based on mean BP
(3 readings at each visit), using a structured stepped-care approach

BP Measurement in SPRINT: Automated Office BP (AOBP)

- Visit BP was the average of 3 seated office BP measurements obtained using an automated measurement device: Omron 907XL.
- Appropriate cuff size was determined by arm circumference.
- Participant was seated with back supported and arm bared and supported at heart level.
- Device was set to delay 5 minutes to begin 3 BP measurements – research staff was trained to push start button and leave exam room during the 5 minute delay and measurements, during which time participant refrained from talking.

Major Inclusion Criteria

≥50 years old

Systolic blood pressure : 130 – 180 mm Hg (treated or untreated)

Additional cardiovascular disease (CVD) risk

Clinical or subclinical CVD (excluding stroke)

Chronic kidney disease (CKD), defined as eGFR 20 – <60 ml/min/1.73m²

Framingham Risk Score for 10-year CVD risk ≥ 15%

Age ≥ 75 years

At least one

Major Exclusion Criteria

Stroke

Diabetes mellitus

Polycystic kidney disease

Congestive heart failure (symptoms or EF < 35%)

Proteinuria >1g/d

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Summary and Conclusions

SPRINT examined effects of more intensive antihypertensive therapy than currently recommended

Participants were US adults ≥ 50 years with hypertension and additional risk for CVD

Rapid and sustained difference in SBP achieved between the two treatment arms

Trial stopped early, due to benefit, after median follow-up of 3.26 years

Incidence of primary outcome (composite of CVD events) 25% lower in Intensive compared to Standard Group and all-cause mortality reduced by 27%.

Treatment effect similar in all six pre-specified groups of interest.

The “number needed to treat” to prevent primary outcome event or death 61 and 90, respectively

Summary and Conclusions

In participants with CKD at baseline, no differences in renal outcomes

In participants without CKD at baseline, incidence of eGFR reduction \geq 30% more common in Intensive Group

No overall difference in serious adverse events (SAEs) between treatment groups

SAEs associated with hypotension, syncope, electrolyte abnormalities, and hospital discharge reports of acute kidney injury or acute renal failure more common in Intensive Group

Overall, benefits of more intensive BP lowering exceeded the potential for harm

A Word about ACCORD

Action to Control Cardiovascular risk in Diabetes

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Pharmacologic Treatment of Hypertension in Adults Aged 60 Years or Older to Higher Versus Lower Blood Pressure Targets:

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Canadian
ALGORITHM

Treatment follow up

6 weeks later Mrs. May returns to discuss HTN treatment. She feels great after retiring from her hectic government job.

At her last visit lisinopril:HCTZ 10:12.5mg half a tab daily was initiated. An Email f/u 3 weeks later revealed home BPs averaging 140/85 at that time she was instructed to increase to a whole tab and follow up in clinic

Home BP readings are consistently 120s/60s on the new dose.

Clinic BP is 145/85,

ARS; What is the next step?

1. Clinic BP is still up, titrate her medication who believes home BP cuffs anyway?
2. Evaluate your staff's BP measurement technique
3. Ask your staff to repeat the BP measurement
4. Get patients BP reading utilizing AOBPM

Guideline Agreement

Adequate Measurement/ proper fitting
cuff

Medication Algorithms- very similar

Initial work up for HTN
Basic labs +/-EKG

Follow up- stressed

Healthy behaviors - stressed

Answered question- What BP Goal do we use?

BP Measurement; Technique Matters

Modern BP brought to US 1905

The mercury sphygmomanometer defined the systolic and diastolic BP by appearance/disappearance of Korotkoff sounds as heard via the stethoscope,

By the middle of the twentieth century, checking BP by sphygmomanometer became part of the routine physical examination

Checklist for Accurate Measurement of BP

Key Steps for Proper BP Measurements

Step 1: Properly prepare the patient.

Step 2: Use proper technique for BP measurements.

Step 3: Take the proper measurements needed for diagnosis and treatment of elevated BP/hypertension.

Step 4: Properly document accurate BP readings.

Step 5: Average the readings.

Step 6: Provide BP readings to patient.

To Eliminate Inaccurate Readings, Position Your Patient Properly

Common positioning problems can lead to inaccurate BP measurement and have a serious impact on the numbers you use to diagnose and determine treatment.

What are your thoughts about your staffs BP measurement technique?

ARS; BP technique assessment

1. Staff hadn't finished taking the BP before I walked in.
2. Cuff should not be placed over clothing
3. Patient should have back supported
4. Arm should be supported
5. Legs should not be dangling
6. Neither the staff nor the patient should be talking
7. All of the above
8. All but #1

Impact of Incorrect BP Measurement Technique

Sitting without back support	+ 6 to + 10 mm Hg
Recent use of tobacco/caffeine	+ 6 to 11 mm Hg
Legs crossed	+ 2 to 8 mm Hg
Cuff too small	+2 to+ 10 mm Hg
Arm unsupported	+ 10 mm Hg
Not using bare arm	+ 5 to + 50 mm Hg SBP
Talking or having full bladder	+ 10 mm Hg

*These values are not cumulative

Issues with the Clinic BP measurement

PATIENT FACTORS

- White Coat HTN- Patient has normal BP everywhere else but in the clinic
- Masked HTN- BP is only normal in clinic

CLINIC FACTORS

- Timing – staff taking BP before allowing patient to come to rest.
- BP measured by physician –tends to be higher
- Reproducibility- often more than 1 BP is needed to confirm actual reading

Ambulatory Office BP Measurement (AOBPM)

AOBPM

- Enforced 5 minute wait before BP measured
- Average of 3 measurements
- Eliminates alerting effect
- Similar reading as daytime ambulatory BP
- On average 10 points lower than traditional BP measured by staff
- The measurement technique used in the SPRINT trial

Ambulatory BP Monitoring (ABPM)

*AKA 24hr BP monitoring

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ACC/AHA Blood Pressure (BP) Thresholds and Recommendations for Treatment and Follow-Up (continued on next slide)

Please see slide at Presentation

Please see slide at presentation

1 year later...

Mrs. May has officially retired and has been successful in getting to her ideal body weight and making exercise a daily habit. She complains of light headedness whenever she stands up quickly after removing her Peloton shoes.

24hr ABPM; Average daytime BP is 105/62, Night time is 90/50

Clinic BP is 120/75 taken manually

ARS; how do you manage the patients new situation?

1. Reduce her BP medication
2. Assess for adequate hydration during her workouts.
3. Congratulate her on a job well done.
4. Have another courageous conversation with your staff about BP technique.
5. All of the above
6. 1, and 2,
7. 3, 1 and 2.

Summary

Guideline discrepancies may represent the nuances in interpretation of data and BP measurement technique utilized.

Technique matters

Masked and White coat HTN are real and should be considered in your patients who note BPs that are different than in the clinic

Lifestyle matters and clinicians need to reinforce the need for healthy activity, and healthy eating.

Consistent monitoring/ follow up is key to long term control

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