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ICSI Hypertension Work Group: 2018 Commentary

Background

In December 2017, the American College of Cardiology/American Heart Association (ACC/AHA), and nine other professional organizations released an updated guideline on hypertension[1]. This guideline reclassified hypertension, with stage 1 hypertension now defined as systolic blood pressure (SBP) 130-139 mm Hg or diastolic blood pressure (DBP) 80-89 mm Hg and stage 2 hypertension defined as SBP ≥ 140 mm Hg or DBP ≥ 90 mm Hg. This is a major change from the 2004 Seventh Report of the Joint National Committee (JNC 7), which defined stage 1 hypertension as SBP 140-159 mm Hg or DBP as 90-99 mm Hg and stage 2 hypertension as SBP ≥ 160 mm Hg or DBP ≥100 mm Hg[2]. It is estimated that 46% of American adults will be diagnosed with hypertension by the new guideline definitions, up from 32% from the JNC 7 panel guideline[1].

Reception to the new ACC/AHA guideline has been mixed. Differing interpretations of the same body of evidence has led to conflicting recommendations. The American College of Physicians (ACP) and American Academy of Family Physicians (AAFP) did not endorse the new ACC/AHA guideline. Notably, ACP and AAFP published a guideline in January 2017 recommending a goal of less than 150/90 mm Hg for adults over age 60[3]. The American Diabetes Association recommends treatment to a BP < 140/90 mm Hg for most patients with diabetes and consideration of a target < 130/80 for those at high cardiovascular risk if it can be achieved without undue burden[4]. As the controversy continues, providers are left wondering how to advise patients.

This goal of this expert work group is to provide guidance to the Minnesota provider community by affirming key parts of the guideline, outlining and addressing criticisms to the guideline, presenting challenges with operations and measurement, and offering key takeaways to share with patients.

Important Concepts Affirmed by the Work Group

This work group affirms the following concepts and recommendations from the ACC/AHA guideline with some additional qualifications.

The ACC/AHA blood pressure goals are appropriate but need to be individualized.
The work group supports the new classification and goal of <130/80 mm Hg, recognizing that, in general, lower blood pressure leads to lower mortality and improved cardiovascular outcomes. However, although cut-points are useful, it is also important to recognize that blood pressure should be treated on a continuum, not a binary scale. While the work group supports the lower blood pressure goals, they also note that goals for the individual patient must be adjusted to consider medical comorbidities, adverse side effects, and cardiovascular risk.

Improve accuracy of office measurement of blood pressure.
Measurement of blood pressure in the clinical setting is fraught with problems. Patients may be rushed on their arrival, blood pressure may be taken incorrectly, and results may be misleading because of white coat hypertension and masked hypertension. Efforts that will improve office measurements include ensuring an appropriate cuff size, allowing the patient to relax prior to blood pressure measurement, averaging several automated readings, and having personnel available to take manual readings as needed. The use of automated office BP measurements would markedly improve the accuracy of measurement and thus the accuracy of hypertension diagnosis and management.

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Expand blood pressure monitoring outside the clinical setting.
New evidence supports the usefulness of blood pressure monitoring outside the clinical setting. Patients should be encouraged to monitor blood pressure readings at home, at work, or in other ambulatory settings as appropriate. Patients need to be instructed on the proper method of taking their own blood pressure and results need to be incorporated into the patient record.

The medication table in the guideline provides comprehensive guidance on medication choice.
The first line antihypertensive medications for a majority of patients are thiazides (or thiazide-type diuretics), ACE inhibitors, ARBs, and CCBs (dihydropyridines and non-dihydropyridines). Beta-blockers are no longer considered first-line agents unless the patient has ischemic heart disease or heart failure. Because of the controversy surrounding the new guideline and the hypertension definitions, the work group worries that valuable information in the guideline is being overlooked. The medication table (Table 18 in the guideline) is a useful tool that may be used by providers to ensure proper medication management.

The guideline provides useful recommendations for patients with specific comorbidities.
The document includes specific recommendations for comorbidities including, but not limited to, ischemic heart disease, heart failure, chronic kidney disease, and acute stroke. We encourage practitioners to review these special considerations.

Work Group Response to Guideline Criticisms

Interpretation of the Evidence
Critics of the guideline point out that it is largely based on the Systolic Blood Pressure Intervention Trial (SPRINT)[5], a randomized controlled trial that included patients over 50 years of age at increased risk for cardiovascular events. The experimental group was targeted to a systolic blood pressure of less than 120 mm Hg, not 130 mm Hg (a diastolic goal was not included). The study excluded those with average cardiovascular risk and excluded diabetes patients.

The work group notes the validity of these criticisms. As is expected with most trials, there are limitations regarding generalizability and applicability. Yet, SPRINT is the largest trial on blood pressure goals to date, involving 102 clinical sites, organized into five clinical center networks, with 9,361 patients and sponsored by the National Institutes of Health. While more studies are warranted to confirm or challenge the findings, SPRINT is a well-done RCT that provides strong evidence to support a more stringent definition of hypertension. It is noteworthy to point out that the ACC/AHA guideline did not use the goal of less than 120 mm Hg as was used in SPRINT. Recognizing real world constraints, a goal of <130 mm Hg was selected.

SPRINT versus ACCORD (Action to Control Cardiovascular Risk in Diabetes)
There were discrepant results between ACCORD[6], a trial restricted to type 2 diabetic patients, and SPRINT, a trial that excluded diabetic patients. In ACCORD, diabetic patients randomized to intensive BP control reached a mean SBP of 118 mm Hg and had a significant reduction in stroke. By contrast, they did not experience a reduction in the composite ACCORD study outcome or mortality. Patients in the intensive treatment arm required 3.5 BP medications and had increased treatment side effects. Patients receiving intensive glucose management did not benefit further from intensive blood pressure management. There is still much controversy about whether the different results in ACCORD and SPRINT are real or due to limitations in study design. Further study of optimal BP targets in patients with diabetes is needed.

Use of the Atherosclerotic Cardiovascular Disease Risk Calculator/Estimator (Pooled Cohorts Equation)
There are concerns that the pooled cohorts equation, used for risk stratifying cardiovascular risk, is not well calibrated. The work group acknowledges that there are potential flaws in the calculator, but overall it is a useful tool that is currently available and easily accessible via electronic medical systems or online.

Patients Aged 65 Years and Older
In the ACC/AHA guideline, the systolic blood pressure goal for patients 65 years and older is less than 130 mm Hg, which is the same goal as for younger patients. This is based on the Hypertension in the Very Elderly Trial (HYVET)[7] and SPRINT, which showed benefit from intensive blood pressure treatment. Because isolated systolic hypertension is the predominant form of hypertension in older adults, the ACC/AHA does not provide parameters for diastolic blood pressure in this population.

Critics argue that goals for the older adults should be different (and higher) than those for young adults. The work group believes that blood pressure goals need to be individualized, based on a number of factors including, but not limited to, age. A goal of less than 130 mm Hg is a reasonable place to start with adjustments based on clinician judgment of patient risk of adverse events, comorbidities, and limited life expectancy.

Diastolic Blood Pressure
There is scant evidence to support recommendations related to a diastolic blood pressure goal for patients of any age. However, there is concern that driving diastolic too low may be harmful to certain patient populations. In the SPRINT trial, subjects who had a diastolic blood pressure <55 mm HG were at increased risk of an adverse event as compared to subjects with a diastolic blood pressure in the range of 55 to 90 mm Hg. Although the observed J-shaped relationship may be because of reverse causality in the SPRINT population, some groups reanalyzing SPRINT and other trial data retrospectively advise caution in aggressively lowering diastolic pressure[8].

Overtreatment
There is concern that this lower goal will lead to inappropriately increased use of antihypertensive medication and side effects, particularly because of the challenges associated with lifestyle changes. The work group shares these concerns. Many patients find lifestyles changes difficult and providers often feel frustrated and ineffective when advising patients to lose weight, exercise more, and improve nutrition. The work group notes that such frustration should not lead to prescription of antihypertensive medication unless the patient's risk profile supports the need for medication. Expecting clinicians to increase their counseling may be an intolerable burden. Better resources, both within and beyond the walls of the clinic, are needed to help patients and their providers address lifestyle changes.

Intellectual Conflict of Interest
The work group leader of the ACC/AHA guideline was also a principal investigator of the SPRINT trial. This potential intellectual conflict of interest was disclosed and the work group does not believe it lessens the validity of the guideline.

Challenges Ahead

Measurement
To understand blood pressure on a population level, it may be most useful to look at the distribution curve of blood pressures across the population. This provides a more detailed picture of the problem, which then helps direct intervention.

The work group agrees with a blood pressure goal of less than 130/80 mm Hg for the general population, to be adjusted as needed for the individual. However, the group has significant concerns with using less than 130/80 mm Hg as an accountability target because it might result in pharmacologic therapy for some patients who are at low cardiovascular risk and should only be treated by lifestyle modifications. The group agrees that because of the individualized nature of hypertension management, flexibility with measurement is critical.

Threshold measures are challenging, because they create a binary situation where one is not intended. It creates false assurance that any number below the threshold is good (e.g., 110 mm Hg and 129 mm Hg become equivalent) and that any number above is bad (e.g. 131 mm Hg and 155 mm Hg become equivalent). Unintended consequences of this approach may be that providers only focus on patients close to the threshold, that providers consider 130/80 mmHg the goal and stop trying to go lower, or that providers prescribe medication before it is indicated, such as in patients at low cardiovascular risk. With conditions such as hypertension that are not binary, personalized measures may be an option (e.g. percentage of patients reaching their defined personal goal).

Operational Challenges and Other Limitations
Critics worry that the millions of additional patients diagnosed with hypertension under the new classification will create a strain on the health care system with more visits required for monitoring and treatment. The work group shares these concerns. Currently, blood pressure is measured at almost all clinical encounters. Moving forward, it may be beneficial to be more deliberate in choosing which visits to measure blood pressure. In addition, we hope that more accurate blood pressure measurement, as advocated for in the guideline, may mitigate the increase in patients expected to have diagnosis of hypertension under the new definitions.

Besides support for the additional volume of patients diagnosed and treated for hypertension, additional system resources will be needed to support:

- more accurate office blood pressure measurement
- teaching staff and patients about out of office blood pressure monitoring
- reviewing and transferring home/ambulatory blood pressure readings into the medical record
- lifestyle changes

Limitations to coverage for home and ambulatory blood pressure monitoring may present another obstacle to implementation of these recommendations.

Key Points for Discussion with Patients

1. The goal of below 130/80 mm Hg is reasonable for most people as long as side effects, if present, are tolerable.
2. Blood pressure goals need to be individualized – you should work with your provider to determine and then reach your optimal blood pressure.
3. Accurate blood pressure measurement is important. In order to get the most complete picture of blood pressure, it may be measured in the office and at home. Your provider may even prescribe a 24-hour recording of your blood pressure.
4. A diet that emphasizes vegetables and fruits and limits animal fats and added salt, a physical activity program, weight control, and cessation programs for nicotine or tobacco users are all important for blood pressure control and overall health and well-being.

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Dr. Patrick O'Connor was an investigator for the SPRINT Trial. Dr. Sandra Taler was an author of the 2017 ACC/AHA guideline. They were allowed to participate in discussions to provide expertise, but because of potential conflict of interest, are not authors of this commentary. The full work group was made aware of these potential conflict interests throughout the process.