**Using the latest evidence to manage hypertension: Implications for nurse practitioner practice**

By: [Leslie L. Davis](https://libres.uncg.edu/ir/uncg/clist.aspx?id=14300)

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**Abstract:**

Hypertension (HTN) is a chronic condition that is frequently the precursor to cardiovascular and metabolic conditions. This article reviews the current literature on the management of HTN in adults, including diagnosis, determination of treatment goals, implementation of treatment regimens, and differentiation between difficult-to-treat and truly resistant HTN. Information is summarized about how nurse practitioners can empower patients to use home blood pressure monitoring. The article incorporates discussion about new research in HTN management and provides insight into the forthcoming Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure report.

**Keywords:** evidence-based practice | hypertension | management | nurse practitioner

**Article:**

Approximately 1 in 3 adults (older than 18) in the United States has hypertension (HTN).1 Prevalence is higher in men up until age 45, then similar for both sexes between ages 45-64; after age 64, more women have the condition.1 In addition, the prevalence of HTN in black Americans is higher than in whites (41% versus 28%, respectively), which is among the highest in the world.1 Furthermore, over half (53.5%) of the 67 million Americans with HTN have uncontrolled blood pressure (BP).1

Unfortunately, of those with uncontrolled BP, 39% are unaware that they have high BP, 16% are aware but not treated with medication, and 45% are taking medication yet do not reach their targeted BP goal.1 Despite what some providers may think, of those with uncontrolled HTN, most have a usual source of health care (89%), have received medical care during the prior year (88%), and have health insurance (85%).1

HTN comes with a cost to society and individuals. In 2010 the estimated direct and indirect cost of HTN in the US was $51 billion and is projected to increase to $343 billion by 2030.1Moreover, HTN accounts for the highest attributable fraction of cardiovascular (CV) disease deaths (40.6%), compared to smoking (13.7%), poor diet (13.2%), physical inactivity (11.9%), and abnormal blood glucose (8.8%).1 In fact, it is estimated that total life expectancy for those who are normotensive is approximately 5 years longer than for those with HTN of the same sex at age 50.1

**Treatment Guidelines for Hypertension**

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7) was published a little over 10 years ago.2As nurse practitioners (NPs) eagerly await publication of the next iteration of the guideline, clinical decisions are primarily based on JNC-7 and research published in the past decade.

Typically, once a writing group commences, revisions made to treatment guidelines take about 18 months to publish. However, the JNC 2013 (formerly called JNC-8) writing group was charged with a different process when they started in 2008. Changes included making recommendations based strictly on the *best* evidence from randomized controlled studies of BP treatment (versus meta-analyses, observational studies, or expert opinion), focusing on answering fewer critical questions (versus providing recommendations on the whole gamut of HTN), and using teleconferences/videoconferences in lieu of face-to-face meetings (a result of budgetary limitations)—all of which slowed down the process.3Furthermore, additional time was needed to ensure congruence with other pending guidelines (ie, risk assessment, lifestyle, obesity, and cholesterol).

Importantly, the delay has *not* been for lack of new evidence or because of controversy over recommendations, as some have speculated. For more information, the National Heart, Lung, and Blood Institute has a table to track the progress of all 5 guidelines (http://www.nhlbi.nih.gov/guidelines/indevelop.htm). This article, thus, provides treatment recommendations based the current guideline (JNC-7), supplementing data from the literature/recent guidelines published from other countries. Insight into what JNC 2013 holds will also be provided, as applicable.

**Definition of HTN**

According to JNC-7, HTN is defined as having a systolic blood pressure (SBP) of ≥ 140 mm Hg or a diastolic blood pressure (DBP) of ≥ 90 mm Hg taken by a health care professional on at least 2 different occasions.2 Prehypertension is defined as having an SBP between 120-139 mm Hg or a DBP of 80-89 mm Hg.2 Normal BP is BP < 120/80 mm Hg.2 If the SBP and DBP fall into different categories, then the patient is assigned the higher category.2 Two other national guidelines published in the past 2 years use the same cut-point for defining HTN (≥ 140/90 mm Hg) (Table 1).4,5 However, there are a few differences.

**Table 1.** Cut-off Values for the Definition of Hypertension Based on National Guidelines

| **JNC-7 (2003)**2 | **NICE (2011)**4 | **ESH/ESC (2013)**5 |
| --- | --- | --- |
| **Hypertension****Stage 1**SBP 140-159 mm Hg or DBP 90-99 mm Hg | **Hypertension****Stage 1**CBPM ≥ 140/90 mm Hgand ABPM/HBPM ≥ 135/85 mm Hg | **Hypertension**a**Grade 1**Clinic BP of SBP 140-159 mm Hg or DBP 90-99 mm HgHome BP: SBP ≥ 135 or ≥ 85 |
| **Stage 2**SBP ≥ 160 mm Hg or DBP ≥ 100 mm Hg | **Stage 2**CBPM ≥ 160/100 mm Hgand ABPM/HBPM ≥ 150/95 mm Hg | **Grade 2**SBP 160-179 mm Hg or DBP 100-109 mm Hg |
|  | **Severe HTN**CBPM SBP ≥ 180 mm Hg or DBP ≥ 110 mm Hg | **Grade 3**SBP ≥ 180 mm Hg or DBP ≥ 110 mm Hg |

ABPM = ambulatory blood pressure measurement; BP = blood pressure; CBPM = clinic blood pressure measurement; DBP = diastolic blood pressure; ESH/ESC = European Society of Hypertension/European Society of Cardiology; HBPM = home blood pressure measurement; JNC = Joint National Committee; NICE = National Institute for Health and Clinical Excellence; SBP = systolic blood pressure.

a. Unchanged from 2003 and 2007.

The National Institute for Health and Clinical Excellence (NICE) 2011 guideline recommends confirming the clinic BP measurement (CBPM) with ambulatory BP measurements (ABPM).4 If the patient declines or does not tolerate ABPM, then home BP measurement (HBPM) is used to confirm the elevated reading in the office. The European Society of Hypertension/European Society of Cardiology (ESH/ESC) 2013 guideline also uses the 140/90 cut-point for defining HTN.5 Rationale for this cut-point is from randomized clinical trials that indicate this point is where initiation of pharmacological treatment of HTN gains the most benefit.5 Thus, it is not anticipated that JNC-2013 will change the current threshold for defining HTN in adults. Whether JNC-2013 will add the recommendation to confirm reading by readings outside the clinic is yet to be determined. If so, the use of HBMP is more likely than ABPM, as ABPM is not generally reimbursed by US insurance companies.

**Detecting High BP**

Most NPs use CBPM for diagnosis and ongoing monitoring of BP. (Refer to Table 2 for information on obtaining accurate BP readings.) However, the exclusive use of CBPM has shortcomings; the measurements may not be representative of the “true” BP readings, diurnal rhythm of BPs cannot be assessed, and the clinician has fewer readings on which to base treatment decisions.6,7 Thus, the American Heart Association (AHA) recommends using HBPM. BP readings obtained by HBPM are closer to ABPM, which is a better predictor of CV risk than clinic measurements.6,7 HBPM is also referred to as self-measured blood pressure (SMBP) monitoring in some publications, since BPs can theoretically be obtained from multiple settings (eg, health care centers, church, community centers, pharmacies, fire stations). Either way, SBP readings outside the office are approximately 5 mm Hg lower.6,7

**Table 2.** Tips for Obtaining Accurate Blood Pressure (BP) Readings

| **General Tips for Taking BP** | **Taking BP in Special Populations** |
| --- | --- |
| • Have the patient in a sitting position, at rest, back supported, with the arm at heart level (otherwise DBP ↑ ∼6 mm Hg).• Remove all constricting clothing on the upper extremity (do not push up clothing).• Tell patient to avoid caffeine or tobacco use at least 30 minutes before BP measurement.• Have patients plant both feet on a flat surface. Crossing legs ↑ SBP ∼2-8 mm Hg.• Use the correct size cuff. Ideal cuff bladder: 80% length and 40% width of arm circumference. Too-large cuff = falsely low BP. Too-small cuff = falsely elevated BP.• Ensure patient *and* provider do *not* talk during the measurement (elevates BP).• First visit: take 2 readings (average them) 5 minutes apart. Confirm elevated reading in contralateral arm. If 1 arm consistently higher, use that arm for subsequent measurements (∼20% of individuals have BP differences > 10 mm Hg).• Do *not* use finger cuffs. | Elderly Individuals• Realize that an auscultatory gap is common (period when sounds of the true SBP fade away and reappear at a lower pressure point). Usually associated with vascular disease and underestimates SBP.• First estimate SBP by inflating BP cuff until palpated radial pulse disappears. Then repeat BP in the regular fashion 1-2 minutes later to auscultate the reading. Make sure cuff is pumped up ∼10 mm Hg higher than previously palpated pulse reading to capture the true SBP (the first Korotkoff sound). First sound may completely disappear and reappear; first sound is SBP that should be used.Individuals with Obesity• Realize that they may have a short upper arm length relative to upper arm width. Wrist cuff may be used; place wrist at heart level to avoid potential for error.Individuals with Arrhythmias• Note that if rhythm very irregular, BP varies beat-to-beat.• Realize that automated devices are inaccurate if only taken once if patient is in atrial fibrillation. Measure BP several times and average the readings.• If severe, regular bradycardia noted, deflate cuff slower to prevent underestimation of SBP and overestimation of DBP. |

DBP = diastolic blood pressure; SBP = systolic blood pressure.

*Data from Pickering et al*.6,7

There are many indications for HBPM, such as ruling out white-coat HTN or masked HTN (Table 3).7 White-coat HTN is defined as having BP readings in the clinic higher than those at home or in an alternative location.7 These patients are at lower risk for BP complications yet are not risk-free.7 According to JNC-7, patients who have elevated clinic BP readings yet normotensive BPs outside the clinic should adopt a heart-healthy lifestyle to slow the development of HTN. Masked HTN is when BP readings in the clinic are lower than those outside the office.6,7 NPs should be vigilant about ruling out masked HTN in patients who are categorized as pre-hypertensive in the office to see if the out-of-clinic BPs are higher.

**Table 3.** Indications for Home Blood Pressure (BP) Monitoring

|  |
| --- |
| • Newly diagnosed persons with hypertension (HTN) (to compare against clinic readings)• Persons with suspected HTN yet normal or prehypertensive in the clinic (to rule out masked HTN)• To evaluate response to treatment• To increase adherence to treatment regimen• Elders with variability in BP readings or white coat HTN• Anyone with variability of BP readings on the same or different visits• Those with diabetes• Pregnant women, children, and those with chronic kidney disease |

*Data from Mancia et al*5*and Pickering et al*.6,7

**Table 4.** How to Implement a Home Blood Pressure Monitoring Protocol

| **Patient Instructions** | **Evaluating Results of HBPM** |
| --- | --- |
| Purchase an approved and validated BP cuff/monitor• Ideally an upper arm cuff, otherwise a wrist cuff• Refer to the DABL educational Web site for a list of validated BP devices: http://www.dableducational.org/sphygmomanometers.htmlValidate accuracy of cuff with clinic readings• Check home monitor for accuracy by comparing to in-office readings. Requires 5 readings total, 2 minutes apart on the same arm. Take 2 readings with patient’s cuff on the arm that typically will be used at home, then measure the 3rd and 4th reading (on the same arm) with office BP cuff. Next, have patient take a 5th BP measurement using the home device on the same arm. In general, BP measurements decline over time (up to ∼10 mm Hg for SBP from 1st through 5th reading). Overall, provider gets a general sense of how close home monitor is to office readings.Begin taking/recording home BP and instruct patient to:• Avoid caffeine, tobacco, or exercise ≥ 30 minutes before measuring BP.• Sit quietly for 5 minutes in a chair with back support. Use nondominant arm (or arm that typically has the higher reading). Place the upper arm at the heart level, in a supported position.• Take 3 readings twice daily (eg, morning, evening/before bedtime) at the same time each day (before medication taken in the morning and again in the evening).• Take readings at least 1 minute apart and record with the time that BP was taken.• Take BP readings initially over a 1-week period.• Avoid taking BP when under unusual stress. | Evaluating first week measurements:• Discard all first day readings and 1st of each triplicate thereafter (tend to be higher than the typical measurements).• Average the 2nd and 3rd reading from each day/evening for the remaining measurements (need a minimum of 12 readings).• Target BP for HBPM is < 135/85 mm Hg; target BP for DM, CHD, or CKD: < 130/80.If over half of remaining BP readings are below the targeted BP, no change is required in the treatment regimen. If over half of BP readings are above target, treatment should be intensified.Evaluating ongoing measurements• Use same protocol as above for dose titration of medications.• For stable, normotensive patients, choose a minimum of 1 week every 3 months.• If patient has uncontrolled HTN or is nonadherent, measurements should be more frequent than 1 week/quarter. |

BP = blood pressure; CHD = coronary heart disease; CKD = chronic kidney disease; DM = diabetes mellitus; HTN = hypertension.

*Data from Pickering et al*.6,7

To implement an HBPM protocol, NPs should advise patients to bring their home cuff/monitor to validate the accuracy of the device. To check the accuracy, the patient takes BP readings using the cuff in the same arm that the NP measures BP with the clinic device. The procedure requires 5 readings total, 2 minutes apart, in the same arm.6,7 Refer to Table 4 for how to implement an HBPM protocol.

**Treatment Goals**

According to JNC-7, the target BP for an adult with HTN is < 140/90 mm Hg, with lower goals (< 130/80 mm Hg) for those with diabetes or chronic kidney disease (CKD).3 While awaiting the JNC-2013 guideline, however, NPs can look to other data for consideration.

In 2013 the American Diabetes Association (ADA) revised the SBP target for those with diabetes to < 140 mm Hg.8 The DBP target, < 80 mm Hg, did not change. The ADA recommendations emphasized that it is still import to control BP, yet noted that there was no benefit gained from lowering SBP to < 130 mm Hg as opposed to < 140 mm Hg. They noted, however, that it is appropriate for some individuals (ie, younger patients) to have a lower target of < 130 mm Hg.8

In addition, a 2011 systematic review examining the best target BP for patients with CKD found no conclusive evidence for recommending a BP target of < 125/85 or < 130/80 (as opposed to < 140/90 mm Hg).9 However, it was noted that patients with proteinuria between 300-1000 mg/dL may benefit from lower BP targets.9 Thus, while awaiting JNC-2013, NPs should individualize BP targets for patients with CKD and proteinuria, balancing side effects of medications (hypotension or worsening kidney disease) with individualized BP goals.

There are also updated recommendations for DBP targets. For example, the 2013 ESH/ESC guideline recommends a DBP target of < 90 mm Hg for all individuals, except for those with diabetes, who should have a goal of < 85 mm Hg.5 It was noted that a goal of 80-85 mm Hg may be considered for those who can tolerate it.5

Another area to stay tuned for in JNC-2013 is a recommendation for optimal BP in the elderly that, to date, has not been definitively defined.10 Research has shown benefits to lowering BP to < 150/80 mm Hg in those ≥ 80 years (ie, lower risk of fatal/nonfatal stroke, heart failure, and CV death or death from any cause).10 Moreover, the 2011 ACCF/AHA consensus document on hypertension in the elderly indicates it is reasonable for those between the ages of 70-80 to have a target SBP of < 140 mm Hg.10 For those > 80, it is reasonable to have a target of < 150 mm Hg, aiming for about 140-145 mm Hg if tolerable.10 Similar recommendations, goal of SBP between 140-150 mm Hg, were made for elders in the ESH/ESC 2013 guideline.5 Regardless, NPs should individualize BP goals for elders, avoiding having targets too high or too low.

It is anticipated that JNC-2013 will provide recommendations for BP targets for various populations and these will be based on evidence from improved long-term outcomes (overall CV, stroke, myocardial infarction, heart failure, and kidney outcomes), not just BP lowering. Other prespecified populations of interest that JNC-2013 *may* address include those with coronary heart disease, heart failure, and peripheral arterial disease.

For now, NPs should use a target SBP of < 140 mm Hg for *most* adults with HTN (including those with diabetes or CKD), higher for those ≥ age 80 (< 150 mm Hg) or those with larger amounts of protein in the urine. Furthermore, the target for DBP should be < 90 mm Hg, except for those with diabetes and more advanced CKD.

**Threshold to Begin Treatment**

JNC-7 recommends that patients not meeting their BP target should begin therapeutic life changes (TLCs) for up to 12 weeks. Then, if still not meeting goals, pharmacologic therapy is added. However, while awaiting JNC-2013, other guideline statements provide insight into whether this recommendation will change. For example, the 2012 Kidney Disease: Improving Global Outcomes (KDIGO) statement recommended pharmacologic treatment for those with diabetes and CKD if their BP is > 140/90 and urine albumin is < 30 mg/24 hours.11 Stricter recommendations were advised for those with urine albumin between 30-300 mg/24 hours; starting medication if BP > 130/80 mm Hg.11

The 2013 ADA guideline recommends persons with diabetes begin drug therapy if their SBP is > 140 mm Hg.8 The 2011 NICE guideline calls for the use of medications for BP > 140/90 mm Hg.4 Likewise the ESH/ESC guideline calls for TLCs and medications for BP > 140/90 mm Hg.5 However, the length of time that TLCs should be implemented *before*starting medications varies, depending on level of CV risk, evidence of end organ damage, and presence of diabetes, CKD, and/or symptomatic CV disease.5

**Which Medication to Use**

In general, research has shown that it is more important to lower BP to goal versus how it is achieved. Furthermore, most patients will require about 3 agents from different classes to control their BP over time. However, NPs are faced with the decision of which medication(s) to start when. JNC-7 recommends that, unless there are compelling indications otherwise (related to comorbid conditions), first-line therapy for essential HTN begins with a thiazide diuretic.2 The ESH/ESC 2013 guidelines provide recommendations for which medication classes should be used when considering selected comorbid conditions, which is similar to many recommendations from JNC-7 (Table 5).5

**Table 5.** Medications Preferred in Specific Comorbid Conditionsa

| **Comorbid Condition** | **JNC-7 (2003)**2 | **ESH/ESC (2013)**5 |
| --- | --- | --- |
| Diabetes | ACE-I or ARBBBCCBDiuretic (thiazide) | *For diabetes*ACE-I or ARB*For metabolic syndrome*ACE-I or ARBCCB |
| Chronic kidney disease | ACE-I or ARB | ACE-I or ARB |
| Heart failure | ACE-I or ARBAldosterone antagonistBBDiuretic (loop preferred) | *For heart failure*ACE-I or ARBMineralocorticoid receptor antagonistBBDiuretic (loop preferred)*For LVH*ACE-I or ARBCCB |
| High coronary disease risk | ACE-IBBCCBDiuretic | BB or CCB for anginaACE-I or CCB for asymptomatic atherosclerosis |
| Post-myocardial infarction | ACE-IAldosterone antagonistBB | ACE-I or ARBBB |
| Recurrent stroke prevention | ACE-IDiuretic (thiazide) | Any effective antihypertensive agent |

ACE-I = angtiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; BB = beta-blocker; ESH/ESC = European Society of Hypertension/European Society of Cardiology; JNC = Joint National Committee; LVH = left ventricular hypertrophy.

a. Medications are listed in alphabetic order, not in order of priority.

Also consistent with JNC-7, the 2013 ADA guideline recommends an angiotensin-converting enzyme inhibitor (ACE-I) or angiotensin receptor blocker (ARB) as first-line treatment for HTN in those with diabetes.8 Likewise the KDIGO guideline recommends an ACE-I or ARB as first-line therapy for those with CKD.11

Notably, the NICE and the ESH/ESC guidelines added complexity to their algorithm for first-line therapy for essential HTN.4,5 For example, the NICE guideline recommended different first-line medications based on stage of HTN, whether target organ damage is present or the 10-year CV risk is > 20%, and varies based on the person’s age and race.3 Patients younger than 55 should receive calcium channel blockers (CCBs) if they are of African or Caribbean descent; otherwise, an ACE-I or ARB. If the patient is older than 55, a CCB is recommended for most, but thiazide diuretics may be considered. There is a preference for chlorthalidone (25-50 mg daily) or indapamine (1.5 mg modified release once-daily or 2.5 mg daily) over other thiazide or thiazide-like diuretics.

As with other guidelines, beta-blockers are less favored (fourth-line treatment), unless the patient is intolerant of ACE-I or ARB, is younger, or has another indication for beta-blockers. Furthermore, the combination of ACE-I/ARB therapy is *not* recommended in the NICE guideline, which is also supported by the ESH/ESC 2013 guideline to avoid dual renin-angiotensin system (RAS) blockade over concerns of hyperkalemia, hypotension, and kidney failure.4,5

**Therapeutic Lifestyle Changes**

JNC-2013 will likely re-emphasize that TLCs are essential to enhance the effectiveness of BP-lowering medications. In addition to TLCs, a 2013 statement from the AHA on alternative therapies for lowering BP offers NPs information for consideration.12 In the statement, evidence related to the effectiveness of behavioral therapies (eg, transcendental meditation, yoga, and other relaxation or meditation techniques), noninvasive procedures or device options (eg, acupuncture or device-guided breathing), and exercise-based regimens (eg, aerobic, resistance, or isometric handgrip exercise) were reviewed to determine if any should be recommended to patients as adjunctive therapy.

The benefits of aerobic exercise was supported by the best evidence as compared to the other alternative therapies in lowering BP, followed by dynamic resistance exercise-based regimens or device-guided breathing.12 Transcendental meditation, biofeedback, and isometric handgrip exercise may be considered useful, but the evidence is less established. Yoga, other meditation/relaxation techniques, and acupuncture were determined to be of no benefit, thus are not recommended for lowering BP. The statement concluded that these options may be useful as adjunctives, not alternatives, for patients with pre-HTN, HTN, or resistant HTN. While the long-term effectiveness is unknown, there does not appear to be a downside other than a possible delay for starting medications in those who need them.

**Difficult-to-Treat Versus Truly Resistant HTN**

It is not anticipated that JNC-2013 will revise recommendations for defining and treating resistant HTN. Notably, the ESH/ESC guideline identified renal denervation as a “promising” therapy in the treatment of resistant HTN.5 However, data are pending from ongoing trials to determine if the BP lowering translates to improved outcomes from the procedure. In the interim, NPs may refer to a 2008 AHA statement on diagnosing and treating resistant HTN.13 Refer to Table 6 for a summary of the step-wise treatment approach used in the AHA statement.

**Table 6.** Step-wise Approach to Treat Resistant Hypertension

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| --- |
| Confirm patient has resistant HTN• On ≥ 3 anti-HTN meds at optimal doses, 1 of which is a diureticRule out contributing lifestyle factors• High salt, low fiber diet• Excessive alcohol• Morbid obesity• Physical inactivityDiscontinue (or minimize) interfering substances• Nonsteroidal anti-inflammatory agents or COX-2 inhibitors, including aspirin• Sympathomimetics (decongestants, diet pills, cocaine)• Stimulants (methylphenidate, dexmethylphenidate, dextroamphetamine, amphetamine, methamphetamine, modafinil)• Oral contraceptives or hormone replacement agents• Some antidepressants• Dietary supplements (ginseng, ephedra, ma huang, bitter orange)• Natural licoriceScreen for secondary causes of HTN• Obstructive sleep apnea• Primary hyperaldosteronism (↑ serum aldosterone/renin level)• Chronic kidney disease (creat clearance < 30 mL/min)• Renal artery stenosis• Rare causes: pheochromocytoma, Cushing syndrome, aortic coarctationIntensify treatment regimen• Therapeutic life-style changes for all• Maximize diuretic: ↑ low dose thiazide to higher dose (from 12.5 to 25 mg hydrochlorothiazide)• 2nd step: convert to a more potent diuretic (chlorthalidone)• 3rd step: convert to loop diuretic if creatinine > 1.5 to 1.8 mg/dL or GFR < 30 mL/min. Prescribe short-acting loop diuretics as bid• Add a mineralocorticoid receptor antagonist (spironolactone)• Combine agents of different actions (vasodilator, heart-rate lowering agent, & diuretic)Refer to HTN specialist• For known or suspected secondary causes of HTN• If BP not to goal with 6 months of treatment |

*Data from Calhoun et al*13*and Viera and Hinderliter*.14

**Conclusion**

As NPs await the JNC 2013 guideline, they may look to the other national guidelines and supplemental research to use for clinical decision making. JNC-2013 will likely use a SBP target of < 140 mm and DBP < 90 mm Hg for *most* adults with HTN, including those with diabetes, except for those ≥ age 80 (< 150 mm Hg) or those with more advanced CKD. There will likely be a preference for using 5 anti-HTN drug classes—diuretics, ACE-Is, ARBs, CCBs, and beta-blockers—as these have the best level of evidence to support use. In addition, NPs should use HBPM as a routine component for BP measurement in patients with known or suspected HTN, to assist with accurate diagnosis and optimize adherence.

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