Proposed New Measure for HEDIS®[1] MY 2025: Blood Pressure Control for Patients With Hypertension (BPC-E)

NCQA seeks comments on a proposed new Electronic Clinical Data System (ECDS) reported measure for inclusion in HEDIS MY 2025: *Blood Pressure Control for Patients With Hypertension* (BPC-E)*:* The percentage of members 18–85 years of age who had a diagnosis of hypertension and whose most recent blood pressure was at the following levels during the measurement period:

- <140/90 mm Hg.
- <130/80 mm Hg.

Controlling high blood pressure, or hypertension, is an important step in preventing heart attack, stroke and kidney disease, and in reducing the risk of developing other serious conditions. Health care providers and plans can help individuals manage high blood pressure by prescribing medications and encouraging low-sodium diets, increased physical activity and smoking cessation.

NCQA is reevaluating measures and products to better reflect existing evidence and guidelines, the evolution of claims data coding and pharmacy data practices and the use of electronic clinical data. This proposed measure is an improvement on the existing *Controlling High Blood Pressure* (CBP) HEDIS measure, which uses the hybrid reporting method (including medical record review) and focuses on blood pressure <140/90 mm Hg. The proposed measure has three key modifications:

- The measure uses the ECDS reporting method.
- The denominator includes a pharmacy data method.
- The numerator includes two rates: Blood Pressure <140/90 mm Hg, Blood Pressure <130/80 mm Hg.

NCQA's long-term goal is to include only the proposed measure in HEDIS. The existing CBP measure will remain in HEDIS while NCQA develops a transition plan.

ECDS Reporting Method

The CBP measure includes hybrid reporting which allows plans to report using either administrative-only data (Administrative Method) or administrative data supplemented with medical record review for a sample of members (Hybrid Method). Removing medical record review, where feasible, can alleviate reporting burden and facilitate the transition to digital measures. The proposed measure transitions from the Hybrid Method by using ECDS reporting. This reporting method includes data sources such as administrative claims, electronic health records, case management and health information exchanges.

Expanded Denominator

The CBP denominator specifies one way to identify individuals with hypertension: claim/encounter data requiring at least two claims-based diagnoses of hypertension within an 18-month period. NCQA analysis showed that the current denominator misses a population of people with one claims-based hypertension diagnosis. This finding and further analyses informed a new, expanded denominator that includes a second way to identify individuals with hypertension: pharmacy data requiring at least one claims-based diagnosis of hypertension and at least one dispensed anti-hypertensive medication within an 18-month period.

Our Measurement Advisory Panels supported the addition of people with one hypertension diagnosis and one dispensed anti-hypertensive medication.

[1] HEDIS® is a registered trademark of the National Committee for Quality Assurance (NCQA).

Expanded Numerator

The CBP measure has one measure rate: Blood Pressure <140/90 mm Hg. Based on consideration of clinical practice guidelines from the American College of Cardiology and the American Heart Association, and on feedback from the NCQA Measurement Advisory Panel, NCQA is considering a second rate in the proposed measure: Blood Pressure <130/80 mm Hg. Evidence shows that both blood pressure targets are beneficial, and that a lower blood pressure target results in fewer cardiovascular events. Evidence and guidelines are described in the attached evidence workup.

Measurement Advisory Panel members emphasized the clinical grounds for adding the second rate to the numerator, noting that measure exclusions remove people for whom the rate is inappropriate. Measure exclusions are defined in the attached draft measure specification.

Our analyses showed that performance in the test population was better for the Blood Pressure <140/90 mm Hg rate, regardless of denominator method. Variation in performance within and across denominator methods suggests significant room for improvement in blood pressure control.

NCQA seeks general feedback on the proposed new measure.

Supporting documents include the measure specification and evidence workup.

NCQA acknowledges the contributions of the Cardiovascular, Geriatric and Technical Measurement Advisory Panels.

Blood Pressure Control for Patients With Hypertension (BPC-E)

SUMMARY OF CHANGES TO HEDIS MY 2025

- This is a first-year measure.

Description	The percentage of members18–85 years of age who had a diagnosis of hypertension (HTN) and whose most recent blood pressure (BP) was at the following levels during the measurement period: • Blood Pressure <140/90 mm Hg. • Blood Pressure <130/80 mm Hg.
Measurement period	January 1–December 31.
Clinical recommendation statement	The American Academy of Family Physicians (AAFP) strongly recommends clinicians treat adults who have hypertension to a standard blood pressure target (<140/90 mm Hg) to reduce the risk of all-cause and cardiovascular mortality. The Joint National Committee recommends that pharmacologic treatment be initiated in the general population <60 years, to lower systolic BP ≥140 mm Hg (and treat to a goal of systolic BP <140 mm Hg) and to lower diastolic BP ≥90 mm Hg (and treat to a goal of diastolic BP <90 mm Hg). The American College of Cardiology (ACC) and American Heart Association (AHA) recommend a target BP of less than 130/80 mm Hg for adults with confirmed hypertension and known cardiovascular disease (CVD) or 10-year atherosclerotic CVD event risk of 10% or higher. In addition, they have determined that a reasonable target BP for adults with confirmed hypertension, without additional markers of increased CVD risk, is less than 130/80 mm Hg.
Citations	Coles, S., L. Fisher, K. Lin, C. Lyon, A. Vosooney, and M. Bird. "Blood Pressure Targets in Adults With Hypertension: A Clinical Practice Guideline From the AAFP." November 14, 2022. James, P.A., S. Oparil, B.L. Carter, W.C. Cushman, C. Dennison-Himmelfarb, J. Handler, D.T. Lackland, et al. "2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8)." *JAMA* 311, no. 5 (February 5, 2014): 507–20. https://doi.org/10.1001/jama.2013.284427. Whelton, P.K., R.M. Carey, W.S. Aronow, D.E. Casey, K.J. Collins, C. Dennison Himmelfarb, S.M. DePalma, et al. "2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines." *Hypertension 71,* no. 6 (June 2018): e13–115. https://doi.org/10.1161/HYP.0000000000000065.

Characteristics	
Scoring	Proportion.
Type	Outcome.
Stratification	• <140/90 mm Hg. – Product line: ▪ Commercial. ▪ Medicaid. ▪ Medicare. – Race (for each product line): ▪ Race—American Indian or Alaska Native. ▪ Race—Asian. ▪ Race—Black or African American. ▪ Race—Native Hawaiian or Other Pacific Islander. ▪ Race—White. ▪ Race—Some Other Race. ▪ Race—Two or More Races. ▪ Race—Asked But No Answer. ▪ Race—Unknown. – Ethnicity (for each product line): ▪ Ethnicity—Hispanic or Latino. ▪ Ethnicity—Not Hispanic or Latino. ▪ Ethnicity—Asked But No Answer. ▪ Ethnicity—Unknown. • <130/80 mm Hg – Product line: ▪ Commercial. ▪ Medicaid. ▪ Medicare. – Race (for each product line): ▪ Race—American Indian or Alaska Native. ▪ Race—Asian. ▪ Race—Black or African American. ▪ Race—Native Hawaiian or Other Pacific Islander. ▪ Race—White. ▪ Race—Some Other Race. ▪ Race—Two or More Races. ▪ Race—Asked But No Answer. ▪ Race—Unknown. – Ethnicity (for each product line): ▪ Ethnicity—Hispanic or Latino. ▪ Ethnicity—Not Hispanic or Latino.

	▪ Ethnicity—Asked But No Answer. ▪ Ethnicity—Unknown.
Risk adjustment **Improvement notation** **Guidance**	None. Increased score indicates improvement. **Allocation:** The member was enrolled with a medical benefit during the measurement period. No more than one gap in enrollment of up to 45 days during the measurement period. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (e.g., a member whose coverage lapses for 2 months [60 days] is not continuously enrolled). The member must be enrolled on the last day of the measurement period. **Reporting:** For all plans, the race and ethnicity stratifications are mutually exclusive, and the sum of all categories in each stratification is the total population. The race and ethnicity stratifications are reported by data source—direct, indirect or unknown. Race and ethnicity values of "Asked But No Answer" are only reported for Source="Direct." Race and ethnicity values of "Unknown" are only reported for Source="Unknown" and Source="Unknown" is only reported for race and ethnicity values of "Unknown." Commercial, Medicaid, Medicare (report each product line separately).
Definitions	
Participation **Participation period**	The identifiers and descriptors for each organization's coverage used to define members' eligibility for measure reporting. Allocation for reporting is based on eligibility during the participation period. The measurement period.
Initial population	Members who are 18-85 years old as of the last day of the measurement period who meet either of the following criteria: **Claim/encounter data method.** At least two diagnoses of hypertension on different dates of service on or between January 1 of the year prior to the measurement period and June 30 of the measurement period. • **Step 1:** Identify members who had at least two outpatient visits, telephone visits, e-visits or virtual check-ins (Outpatient and Telehealth Without UBREV Value Set) on different dates of service with a diagnosis of hypertension (Essential Hypertension Value Set).

	• **Step 2:** Remove members who had a nonacute inpatient admission during the measurement period. To identify nonacute inpatient admissions: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim. 3. Identify the admission date for the stay. **Pharmacy data method.** At least one diagnosis of hypertension and at least one anti-hypertension medication dispensing event on or between January 1 of the year prior to the measurement period and June 30 of the measurement period. • **Step 1:** Identify at least one outpatient visit, telephone visit, e-visit or virtual check-in (Outpatient and Telehealth Without UBREV Value Set) with a diagnosis of hypertension (Essential Hypertension Value Set) ***and*** at least one dispensed antihypertensive medication (Antihypertensive Medications List). • **Step 2:** Exclude members with a nonacute inpatient admission during the measurement period. To identify nonacute inpatient admissions: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim. 3. Identify the admission date for the stay.
Exclusions	Exclude members who meet any of the following criteria: • Members who use hospice services (Hospice Encounter Value Set; Hospice Intervention Value Set) or elect to use a hospice benefit any time during the measurement period. Organizations that use the Monthly Membership Detail Data File to identify these members must use only the run date of the file to determine if the member elected to use a hospice benefit during the measurement period. • Members who die any time during the measurement period. • Members receiving palliative care (Palliative Care Assessment Value Set; Palliative Care Encounter Value Set; Palliative Care Intervention Value Set) any time during the measurement period. • Members who had an encounter for palliative care (ICD-10-CM code Z51.5) anytime during the measurement period. Do not include laboratory claims (claims with POS code 81). • Members with a diagnosis that indicates end-stage renal disease (ESRD) (ESRD Diagnosis Value Set; History of Kidney Transplant Value Set), any time during the member's history on or prior to the last day of the measurement period. Do not include laboratory claims (claims with POS code 81). • Members with a procedure that indicates ESRD: dialysis (Dialysis Procedure Value Set), nephrectomy (Total Nephrectomy Value Set;

Partial Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set) any time during the member's history on or prior to the last day of the measurement period.

- Members with a diagnosis of pregnancy (Pregnancy Value Set) any time during the measurement period. Do not include laboratory claims (claims with POS code 81).
- Medicare members 66 years of age and older as of the last day of the measurement period who meet either of the following:
  - Enrolled in an Institutional SNP (I-SNP) any time during the measurement period.
  - Living long-term in an institution any time during the measurement period as identified by the LTI flag in the Monthly Membership Detail Data File. Use the run date of the file to determine if a member had an LTI flag during the measurement period.
- Members 66–80 years of age as of the last day of the measurement period (all product lines) with frailty ***and*** advanced illness. Members must meet **BOTH** frailty and advanced illness criteria to be excluded:
  1. **Frailty.** At least two indications of frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) with different dates of service during the measurement period. Do not include laboratory claims (claims with POS code 81).
  2. **Advanced Illness.** Either of the following during the measurement period or the year prior to the measurement period:
     - Advanced illness (Advanced Illness Value Set) on at least two different dates of service. Do not include laboratory claims (claims with POS code 81).
     - Dispensed dementia medication (Dementia Medications List).
- Members 81 years of age and older as of the last day of the measurement period (all product lines) with at least two indications of frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) with different dates of service during the measurement period. Do not include laboratory claims (claims with POS code 81).

Dementia Medications

Description	Prescription
Cholinesterase inhibitors	• Donepezil • Galantamine • Rivastigmine
Miscellaneous central nervous system agents	• Memantine
Dementia combinations	• Donepezil-memantine

Denominator	The initial population, minus exclusions.
Numerator	***Numerator 1:*** **Members with a systolic and diastolic reading <140/90 mm Hg.**

	The lowest systolic and diastolic BP values <140/90 (Systolic Blood Pressure Value Set; Diastolic Blood Pressure Value Set) from the most recent day a BP was recorded during the measurement period, on or after the date of the second hypertension event. Do not include BPs taken in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set) or ED visit (ED Value Set; POS code 23). If there are multiple BPs on the same date of service, use the lowest systolic and lowest diastolic BP on that date as the representative BP. The member is numerator compliant if the representative BP is <140/90 mm Hg. The member is not compliant if the BP is ≥140/90 mm Hg, if there is no BP reading during the measurement period or if the reading is incomplete (e.g., the systolic or diastolic level is missing). If the most recent blood pressure was identified based on a CPT Category II code (Systolic and Diastolic Result Value Set) use the following to determine compliance: • Systolic Compliant: Systolic Less Than 140 Value Set. • Systolic Not Compliant: CPT-CAT-II code 3077F. • Diastolic Compliant: Diastolic Less Than 90 Value Set. • Diastolic Not Compliant: CPT-CAT-II code 3080F. ***Numerator 2:*** **Members with a systolic and diastolic reading <130/80 mm Hg.** The lowest systolic and diastolic BP values <130/80 (Systolic Blood Pressure Value Set; Diastolic Blood Pressure Value Set) from the most recent day a BP was recorded during the measurement period, on or after the date of the second hypertension event. Do not include BPs taken in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set) or ED visit (ED Value Set; POS code 23). If there are multiple BPs on the same date of service, use the lowest systolic and lowest diastolic BP on that date as the representative BP. The member is numerator compliant if the representative BP is <130/80 mm Hg. The member is not compliant if the BP is ≥130/80 mm Hg, if there is no BP reading during the measurement period or if the reading is incomplete (e.g., the systolic or diastolic level is missing). If the most recent blood pressure was identified based on a CPT Category II code (Systolic and Diastolic Result Value Set) use the following to determine compliance: • Systolic Compliant: CPT-CAT-II code 3074F; CPT-CAT-II code 3077F. • Systolic Not Compliant: Systolic Greater Than or Equal To 130 Value Set. • Diastolic Compliant: CPT-CAT-II code 3078F. • Diastolic Not Compliant: Diastolic Greater Than or Equal To 80 Value Set.

Data Elements for Reporting

Organizations that submit data to NCQA must provide the following data elements in a specified file.

Table BPC-E-A-1/2/3: Data Elements for Blood Pressure Control for People With Hypertension

Metric	Data Element	Reporting Instructions
BPUnder140Over90	InitialPopulation	Repeat per Metric
BPUnder130Over80	ExclusionsByEHR	Repeat per Metric
	ExclusionsByCaseManagement	Repeat per Metric
	ExclusionsByHIERegistry	Repeat per Metric
	ExclusionsByAdmin	Repeat per Metric
	Exclusions	(Sum over SSoRs)
	Denominator	Repeat per Metric
	NumeratorByEHR	For each Metric
	NumeratorByCaseManagement	For each Metric
	NumeratorByHIERegistry	For each Metric
	NumeratorByAdmin	For each Metric
	Numerator	(Sum over SSoRs)
	Rate	(Percent)

Table BPC-E-B-1/2/3: Data Elements for Blood Pressure Control for People With Hypertension: Stratifications by Race

Metric	Race	Source	Data Element	Reporting Instructions
BPUnder140Over90	AmericanIndianOrAlaskaNative	Direct	InitialPopulation	For each Stratification
BPUnder130Over80	Asian	Indirect	Exclusions	For each Stratification
	BlackOrAfricanAmerican	Unknown**	Denominator	For each Stratification
	NativeHawaiianOrOtherPacificIslander	Total	Numerator	For each Stratification
	White		Rate	(Percent)
	SomeOtherRace			
	TwoOrMoreRaces			
	AskedButNoAnswer*			
	Unknown**			

Table BPC-E-C-1/2/3: Data Elements for Blood Pressure Control for People With Hypertension: Stratifications by Ethnicity

Metric	Ethnicity	Source	Data Element	Reporting Instructions
BPUnder140Over90	HispanicOrLatino	Direct	InitialPopulation	For each Stratification
BPUnder130Over80	NotHispanicOrLatino	Indirect	Exclusions	For each Stratification
	AskedButNoAnswer*	Unknown**	Denominator	For each Stratification
	Unknown**	Total	Numerator	For each Stratification
			Rate	(Percent)

*AskedButNoAnswer is only reported for Source= "Direct"

**Race/Ethnicity = "Unknown" is only reported for Source = "Unknown"; Source = "Unknown" is only reported for Race/Ethnicity = "Unknown."

Blood Pressure Control for Patients With Hypertension
Measure Workup

Topic Overview

Importance and Prevalence

High blood pressure (HBP), also known as hypertension, occurs when the pressure in blood vessels is higher than normal (Centers for Disease Control and Prevention [CDC], 2017). The causes of hypertension can be based on genetic predisposition, environmental risk factors, overweight and obesity, sodium intake, potassium intake, physical activity and alcohol use. HBP is historically defined as BP ≥140/90 mm Hg, and many sources reference this definition. The American College of Cardiology (ACC) and the American Heart Association (AHA) released an updated guideline in 2017 that redefined HBP as BP ≥130/80 mm Hg (Whelton et al, 2017). The annual AHA *Heart Disease and Stroke Statistics* report references this definition as of the 2019 update (Benjamin et al, 2019).

In an analysis of adults with hypertension, defined as BP ≥140/90, the National Health And Nutrition Examination Survey (NHANES) found the estimated age-adjusted proportion with controlled BP increased from 31.8% in 1999-2000 to 53.8% in 2013-2014, then decreased to 43.7% in 2017-2018 (Tsao et al., 2023). Based on the new definition of HBP (≥130/80 mm Hg), NHANES estimated nearly half of United States (U.S.) adults (48.1%) had uncontrolled hypertension from 2017–2020 (CDC, 2023). Between 2017–2020, the prevalence of hypertension (systolic blood pressure ≥130 mm Hg or diastolic blood pressure ≥80 mm Hg, taking antihypertensive medication [self-report], or if the person was told on two occasions that they had hypertension) among U.S. adults 65 to 74 years of age was 72.0% in men and 75.1% in women, and 80.1% in men and 80.7% in women aged 75 years and older (Tsao et al., 2023).

The prevalence of hypertension rises with increasing age and varies by race. Data from the Framingham Heart Study found that among adults with a baseline systolic blood pressure/diastolic blood pressure (SBP/DBP) of 130–130/85–89 mm Hg, 49.5% of adults 65–94 developed hypertension, compared to 37.3% of adults 35–64 (Vasan, 2001). Among races, Black individuals have the highest prevalence of hypertension across the world (Benjamin et al., 2017). Between 2011 and 2014, the age-adjusted prevalence of hypertension among non-Hispanic Black males and females was 45% and 46.3%; 34.5% and 32.3% among non-Hispanic White males and females; 28.8% and 25.7% among non-Hispanic Asian males and females; and 28.9 and 30.7% among Hispanic males and females (Benjamin et al., 2017).

HBP increases risks of heart disease and stroke, leading causes of death in the U.S. (CDC, 2022). A person with HBP is four times more likely to die from a stroke and three times more likely to die from heart disease (CDC, 2021). The National Center for Health Statistics reported that in 2020 there were over 670,000 deaths with HBP as a primary or contributing cause (CDC, 2022). Between 2010 and 2020, the number of deaths due to HBP rose by 54.8% (Tsao et al., 2023). Age-adjusted death rates attributable to HBP in 2020 were almost twice as high in non-Hispanic Black males (325.3 deaths per 100,000) than in non-Hispanic White males (175.7 deaths per 100,000) (Tsao et al., 2023).

For risk of cardiovascular disease, a 1999–2019 analysis found that mortality for men was 76% greater for those with systolic blood pressure (≥160 mm Hg) than for men with systolic blood pressure between 100 and <110 mm Hg, and 31% and 147% greater for those with diastolic blood pressure between 80 and <90 mm Hg and ≥100 mm Hg, respectively, than for men with diastolic blood pressure between 70 and <80 mm Hg.

Mortality for women was 61%, 75% and 113% greater for those with systolic blood pressure from 130 to <140 mm Hg, 140 to <160 mm Hg and ≥160 mm Hg, respectively, than for women with systolic blood

pressure between 100 and <110 mm Hg, and 45% greater for those with diastolic blood pressure from 80 to <90 mm Hg and 145% greater for women with diastolic blood pressure ≥100 mm Hg than for women with diastolic blood pressure between 70 and <80 mm Hg (Elfassy et al., 2023).

Financial importance and cost-effectiveness	Hypertension was the primary cause of approximately 3.7 million hospital outpatient visits in 2011 and about 900,000 emergency department visits in 2012 (Benjamin et al, 2017). It cost the U.S. approximately $131B each year, averaged over 12 years, from 2002–2014 (Kirkland et al., 2018). Total direct costs of HBP are projected to increase to $200B by 2030 (Benjamin et al, 2017). A study on cost-effectiveness of treating hypertension found that controlling HBP in patients with cardiovascular disease based on intensive (110-130 mm Hg) or standard (130-150 mm Hg) SBP control could be effective and cost-saving (Liao et al., 2023).

Supporting Evidence for Treating Blood Pressure to Lower Targets

Despite varying definitions and treatment recommendations of HBP by different organizations, all guidelines agree that controlling HBP will significantly reduce the risks of cardiovascular disease mortality and lead to better health outcomes, such as reduction of heart attacks, stroke and kidney disease (James et al., 2014). Current guidelines issued by organizations, including the ACC and the AHA, define hypertension as blood pressure consistently at or above 130/80 mm Hg. Likewise, these guidelines suggest providers treat most patients to a blood pressure target of <130/80 (Whelton et al. 2018). More recently, in 2022, the American Academy of Family Physicians (AAFP) released updated guidelines that suggested providers consider treating patients to a blood pressure of <135/85. This update comes in response to low-moderate quality evidence that suggests treating patients to a lower threshold result in fewer cardiac events. This guideline also recommends treating patients to a threshold of <140/90 but recognizes that treating patients to a lower threshold is shown to decrease risk of myocardial infarction (Coles et al., 2022).

Many studies have shown that controlling HBP reduces cardiovascular events and mortality. The Systolic Blood Pressure Intervention Trial (SPRINT) investigated the impact of obtaining an SBP goal of <120 mm Hg compared to <140 mm Hg among patients 50 and older with established cardiovascular disease, and found that the patients with the former goal had reduced cardiovascular events and mortality. The study also found that patients with a BP of ≥130 mm Hg had increased cardiovascular risk (SPRINT, 2015). Evidence and guidelines suggest that treating patients to a lower threshold results in fewer cardiac events. The measure currently focuses on a relatively healthy population and excludes older, frail adults and those with advanced illnesses. With this information in mind, NCQA received support from the Geriatric Measurement Advisory Panel, Technical Measurement Advisory Panel and Cardiovascular Measurement Advisory Panel to incorporate the lower evidence-based target of <130/80 mm Hg into a new BP control concept.

Therapeutic options	There are nonpharmacological and pharmacological options to prevent and control HBP. Nonpharmacological options include lifestyle changes that individuals with elevated blood pressure or HBP can make such as weight loss, dietary changes (reducing sodium intake and increasing potassium intake), increasing physical activity, reducing the consumption of alcohol, quitting smoking and getting better sleep (CDC, 2016; Eckel et al., 2013; Whelton et al., 2017; Barone Gibbs et al., 2021; Mayo Clinic, 2022; National Heart, Lung, and Blood Institute, 2022). When nonpharmacological options alone do not control an individual's HBP, clinicians may prescribe medications, alongside continued nonpharmacological approaches (James et al., 2014; Whelton et al., 2017). Pharmacological treatment is based on the individual's BP, age, cardiovascular risk factors and other existing comorbidities such as chronic kidney disease (James et al., 2014; Whelton et al.,

2017). Recommendations for first-line drug therapy include calcium channel blockers (CCB), angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) and thiazide diuretics. These can be prescribed as a monotherapy or in combination (James et al., 2014; Whelton et al., 2017). After evaluation, if a patient is still not reaching BP goals, the physician can add additional medication classes (e.g., beta blocker, aldosterone antagonist) (James et al., 2014).

As with most medications, there are risks of side effects. CCBs can cause palpitations, swollen ankles, constipation, headaches and/or dizziness. ACE inhibitors may cause skin rash, loss of taste and, in rare cases, kidney damage. ARBs may cause occasional dizziness. Diuretics can cause a decrease in potassium, leading to weakness, leg cramps or fatigue (American Heart Association, 2017).

Health care disparities

There are disparities in awareness, treatment and control of hypertension. NHANES data from 2015–2018 showed that among people 20–39 with hypertension, 37% were aware of their condition, 17% were under current treatment and 7% had their hypertension under control (Virtani et al., 2021). Older adults are more likely to be aware of and receive treatment for their hypertension. Of adults ≥60 years of age with hypertension, 75% were aware of their condition, 69% were under current treatment and 29% had their hypertension under control (Virani et al., 2021). When compared to non-Hispanic White and non-Hispanic Black adults, Hispanic and non-Hispanic Asian adults are less likely to be aware of their hypertension, and less likely to require treatment for managing it (Virani et al., 2021). In terms of socioeconomic status (SES), a meta-analysis of 51 studies demonstrated that lower SES is linked to increased risk of hypertension. Lower-educated individuals are twice as likely to have hypertension than higher-educated individuals (Leng et al., 2015; Nakagomi et al., 2022).

Gaps in care

Over three years of HEDIS data, commercial, Medicare and Medicaid product lines have shown a slight decrease in performance of controlling HBP, which indicates widespread gaps in care and continued room for improvement. The average performance from 2019–2021 was 54% for commercial plans, 67% for Medicare plans and 58% for Medicaid plans.

References

American Heart Association. Types of Blood Pressure Medications. 2017. http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/MakeChangesThatMatter/Types-of-Blood-Pressure-Medications_UCM_303247_Article.jsp#.Wl60Ha6nHIU

Barone Gibbs, Bethany, Marie-France Hivert, Gerald J. Jerome, William E. Kraus, Sara K. Rosenkranz, Erica N. Schorr, Nicole L. Spartano, and Felipe Lobelo. “Physical Activity as a Critical Component of First-Line Treatment for Elevated Blood Pressure or Cholesterol: Who, What, and How?: A Scientific Statement From the American Heart Association.” Hypertension 78, no. 2 (August 2021): e26–37. https://doi.org/10.1161/HYP.0000000000000196.

Benjamin, E.J. et al. 2017. “Heart Disease and Stroke Statistics—2017 Update: A Report From the American Heart Association.” *Circulation* 135:00–00. DOI: 10.1161/CIR.0000000000000485

Benjamin, E.J. et al. 2019. “Heart Disease and Stroke Statistics—2019 Update: A Report From the American Heart Association.” *Circulation* 139:e56–e528. DOI: 10.1161/CIR.0000000000000659

Centers for Disease Control and Prevention. 2023. “Hypertension Prevalence in the U.S. | Million Hearts®.” Centers for Disease Control and Prevention. May 12, 2023. https://millionhearts.hhs.gov/data-reports/hypertension-prevalence.html.

Centers for Disease Control and Prevention. 2021. “Team-Based Care for High Blood Pressure,” https://www.cdc.gov/policy/4olaris/healthtopics/highbloodpressure/tbctool.html.

Centers for Disease Control and Prevention. 2016. *Division for Heart Disease and Stroke Prevention: High Blood Pressure Fact Sheet.* https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_bloodpressure.htm.

Centers for Disease Control and Prevention, National Center for Health Statistics. 2022. *About Multiple Cause of Death, 1999–2020.* CDC WONDER Online Database website. Atlanta, GA: Centers for Disease Control and Prevention. http://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm#Mortality_Multiple

Centers for Disease Control and Prevention, National Center for Health Statistics. 2014. “Mortality Multiple Cause Micro-Data Files, 2014: Public-Use Data File and Documentation: NHLBI Tabulations.” http://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm#Mortality_Multiple.

Coles, S., L. Fisher, K. Lin, C. Lyon, A. Vosooney, and M. Bird. 2022. “Blood Pressure Targets in Adults With Hypertension: A Clinical Practice Guideline From the AAFP,” November.

Crim M.T., S.S. Yoon, E. Ortiz, H.K. Wall, S. Schober, C. Gillespie, P. Sorlie, N. Keenan, D. Labarthe, Y. Hong. 2012. “National Surveillance Definitions for Hypertension Prevalence and Control Among Adults.” *Circ Cardiovasc Qual Outcomes* 5:343–51. Doi: 10.1161/ CIRCOUTCOMES.111.963439

Eckel, R.H., J.M. Jakicic, J.D. Ard, et al. 2013. “AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines.” *Circulation.* Doi:10.1161/01.cir.0000437740.48606.d1

Elfassy, Tali, Charles A. German, Paul Muntner, Eunhee Choi, Gabriel Contreras, Daichi Shimbo, and Eugene Yang. “Blood Pressure and Cardiovascular Disease Mortality Among US Adults: A Sex-Stratified Analysis, 1999–2019.” Hypertension 80, no. 7 (July 2023): 1452–62. https://doi.org/10.1161/HYPERTENSIONAHA.123.21228.

James, P.A., S. Oparil, B.L. Carter, W.C. Cushman, C. Dennison-Himmelfarb, et al. 2014. “Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report from the Panel Members Appointed to the Eight Joint National Committee (JNC8).” *JAMA* 311(5):507–20. Doi:10.1001/jama.2013.284427

Kirkland, E.B., M. Heincelman, K.G. Bishu, S.O. Schumann, A. Schreiner, R.N. Axon, P.D. Mauldin, & W.P. Moran. 2018. “Trends in Healthcare Expenditures Among US Adults With Hypertension: National Estimates, 2003–2014.” *Journal of the American Heart Association 7*(11), e008731. https://doi.org/10.1161/JAHA.118.008731

Leng, B., Y. Jin, G. Li, L. Chen, N. Jin. 2015. “Socioeconomic Status and Hypertension: A Meta-Analysis.” *J Hypertens* 33:221–9. Doi: 10.1097/HJH.0000000000000428

Liao, Chia-Te, Han Siong Toh, Li Sun, Chun-Ting Yang, Angie Hu, Dongmei Wei, Jesus Melgarejo, and Zhen-Yu Zhang. “Cost-Effectiveness of Intensive vs Standard Blood Pressure Control Among Older Patients With Hypertension.” JAMA Network Open 6, no. 2 (February 27, 2023): e230708. https://doi.org/10.1001/jamanetworkopen.2023.0708.

Mayo Clinic. “10 Drug-Free Ways to Control High Blood Pressure.” Accessed February 8, 2024. https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/in-depth/high-blood-pressure/art-20046974.

Muntner, P., R.M. Carey, S. Gidding, D.W. Jones, S.J. Taler, J.T. Wright, P.K. Whelton. 2018. “Potential US Population Impact of the 2017 ACC/AHA High Blood Pressure Guideline.” *Circulation* 137:109–18. Doi: 10.1161/CIRCULATIONAHA.117.032582

Nakagomi, Atsushi, Yuichi Yasufuku, Takayuki Ueno, and Katsunori Kondo. “Social Determinants of Hypertension in High-Income Countries: A Narrative Literature Review and Future Directions.” Hypertension Research 45, no. 10 (October 2022): 1575–81. https://doi.org/10.1038/s41440-022-00972-7.

National Heart, Lung, and Blood Institute. “Sleep Deprivation and Deficiency - What Are Sleep Deprivation and Deficiency? | NHLBI, NIH,” March 24, 2022. https://www.nhlbi.nih.gov/health/sleep-deprivation.

SPRINT Research Group; Wright, J.T., Jr., J.D. Williamson, P.K. Whelton, … W.T. Ambrosius. 2015. "A Randomized Trial of Intensive Versus Standard Blood-Pressure Control." *N Engl J Med* 373:2103–16.
https://doi.org/10.1161/CIR.0000000000001052

Tsao, C.W., A.W. Aday, Z.I. Almarzooq, … B.M. Kissela, et al. 2023. "Heart Disease and Stroke Statistics—2023 Update: A Report From the American Heart Association | Circulation." Accessed February 8, 2024. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001123.

Vasan, R.S., M.G. Larson, E.P. Leip, W.B. Kannel, D. Levy. 2001. "Assessment of Frequency of Progression to Hypertension in Non-Hypertensive Participants in the Framingham Heart Study: A Cohort Study." *Lancet* 358:1682–86. doi: 10.1016/S0140-6736(01)06710-1

Virani, S.S., A. Alonso, H.J. Aparicio, et al., on behalf of the American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. 2021. "Heart Disease and Stroke Statistics—2021 Update: A Report From the American Heart Association." *Circulation* 143:e254–e743. doi: 10.1161/CIR.0000000000000950

Whelton, P.K., R.M. Carey, W.S. Aronow, et al. 2017. "Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American heart Association Task Force on Clinical Practice Guidelines." https://doi.org/10.1161/HYP.0000000000000065

Specific Guideline Recommendations

Clinical Practice Guideline: Treatment Target Recommendations

Organization, Year	Population	Systolic Blood Pressure Target Recommendation (mmHg)	Diastolic BP Target Recommendation (mmHg)	Grade of Recommendation
American Academy of Family Physicians, 2022	Adults with hypertension	<140	<90	Strong recommendation, high quality evidence
	Adults with hypertension	<135	<85	Weak recommendation, moderate quality of evidence
American College of Cardiology/American Heart Association, 2017	For adults with confirmed hypertension and known CVD or 10-year ASCVD event risk of 10% or higher a BP	<130	<80	COR I, Level of evidence SBP: B-R SR Level of evidence DBP: C-EO
	For adults with confirmed hypertension, without additional markers of increased CVD risk	<130 Note: The narrative of the guideline also includes the following regarding this population: “The clinical trial evidence is strongest for a target BP of 140/90 mm Hg in this population. However, observational studies suggest that these individuals often have a high lifetime risk and would benefit from BP control earlier in life.”	<80	COR IIb SBP Level of evidence B-NR DBP Level of evidence C-EO
	Adults with hypertension and Chronic Kidney Disease	<130	<80	COR I SBP Level of evidence BR-SR DBP Level of evidence C-EO

Organization, Year	Population	Systolic Blood Pressure Target Recommendation (mmHg)	Diastolic BP Target Recommendation (mmHg)	Grade of Recommendation
	Hypertensive adults after kidney transplant	<130	<80	COR IIa SBP Level of evidence B-NR DBP Level of evidence C-EO
	Noninstitutionalized ambulatory community dwelling adults ≥65 years of age	<130	<80	COR I Level of evidence A
	Adults ≥65 years of age with hypertension and a high burden of comorbidity and limited life expectancy	Use clinical judgement, patient preferences, and a team-based approach to assess risk/benefit is reasonable for decisions regarding intensity of BP lowering and choice of antihypertensive drugs		COR IIa Level of evidence C-EO
American College of Physicians and the American Academy of Family Physicians, 2017	Hypertensive adults ≥60 years	<150	N/A	Strong, high-quality evidence
	Hypertensive adults ≥60 years with a history of stroke or transient ischemic attack	<140	N/A	Weak, moderate-quality evidence
	Hypertensive adults ≥60 years with high cardiovascular risk	<140	N/A	Weak, low-quality evidence
Eight Report of the Joint National Committee, 2014	General hypertensive population of adults <60 years of age	<140	<90	Grade E for SBP < 140 mmHg Grade A for DBP for ages 30 -59 Grade E for DBP for ages 18-29
	General hypertensive population of adults ≥60 years or older	<150	<90	A

Grading System Key

American College of Cardiology/American Heart Association: Applying Class of Recommendation and Level of Evidence to Clinical Strategies, Interventions, Treatment, or Diagnostic Testing in *Patient Care*

Class (Strength) of Recommendation

Class	Suggestion for Practice
I (Strong) Benefit >>> Risk	Suggested phrases for writing recommendations: • Is recommended • Is indicated/useful/effective/beneficial • Should be performance/administered/other • Comparative-Effectiveness Phrases: – Treatment/strategy A is recommended/indicated in preference to treatment B – Treatment A should be chosen over treatment B
Class IIa (Moderate) Benefit >> Risk	Suggested phrases for writing recommendations: • Is reasonable • Can be useful/effective/beneficial • Comparative-Effective Phrases: – Treatment/strategy A is probably recommended/indicated in preference to treatment B – It is reasonable to choose treatment A over treatment B
Class IIb (weak) Benefit ≥ Risk	Suggested phrases for writing recommendations: • May/might be reasonable • May/might be considered • Usefulness/effectiveness is unknown/unclear/uncertain or not well established
Class III: No Benefit (moderate) Benefit = Risk	Suggested phrases for writing recommendations: • Is not recommended • Is not indicated/useful/effective/beneficial • Should not be performed/administered/other
Class III: Harm (strong) Risk > Benefit	Suggested phrases for writing recommendations: • Potentially harmful • Causes harm

Class	Suggestion for Practice
	• Associated with excess morbidity/mortality • Should not be performed/administered other

Level (Quality) of Evidence

Level	Definition
A	• High-quality evidence from more than 1 randomized control trial (RCT) • Meta-analyses of high-quality RCTs • One or more RCTs corroborated by high-quality registry studies
B-R (randomized)	• Moderate-quality evidence from 1 or more RCTs • Meta-analyses of moderate-quality RCTs
B-NR (nonrandomized)	• Moderate-quality evidence from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies • Meta-analyses of such studies
C-LD (limited data)	• Randomized or nonrandomized observational or registry studies with limitations of design or execution • Meta-analyses of such studies • Physiological or mechanistic studies in human subjects
C-EO (Expert Opinion)	Consensus of expert opinion based on clinical experience

America College of Physicians' Guideline Grading System

Quality of Evidence	Strength of Recommendation	
	Benefits clearly outweigh risks and burden or risks and burden clearly outweigh benefits	Benefits finely balanced with risks and burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

Type of Evidence	Quality Rating
• Well-designed, well-executed RCTs that adequately represent populations to which the results are applied and directly assess effects on health outcomes • Well-conducted meta-analyses of such studies • Highly certain about the estimate of effect; further research is unlikely to change our confidence in the estimate of effect	High
• RCTs with minor limitations affecting confidence in, or applicability of, the results • Well-designed, well-executed non–randomized controlled studies and well-designed, well-executed observational studies • Well-conducted meta-analyses of such studies • Moderately certain about the estimate of effect; further research may have an impact on our confidence in the estimate of effect and may change the estimate	Moderate
• RCTs with major limitations • Non–randomized controlled studies and observational studies with major limitations affecting confidence in, or applicability of, the results • Uncontrolled clinical observations without an appropriate comparison group (e.g., case series, case reports) • Physiological studies in humans • Meta-analyses of such studies • Low certainty about the estimate of effect; further research is likely to have an impact on our confidence in the estimate of effect and is likely to change the estimate.	Low

Eight Report of the Joint National Committee—Evidence Quality Rating

Grade	Strength of Recommendation
A	Strong Recommendation There is high certainty based on evidence that the net benefit is substantial.
B	Moderate Recommendation There is moderate certainty based on evidence that the net benefit is moderate to substantial or there is high certainty that the net benefit is moderate.
C	Weak Recommendation There is at least moderate certainty based on evidence that there is a small net benefit.
D	Recommendation Against There is at least moderate certainty based on evidence that it has no net benefit or that risks/harms outweigh benefits.

Grade	Strength of Recommendation
E	Expert Opinion (“There is insufficient evidence or evidence is unclear or conflicting, but this is what the committee recommends.”) Net benefit is unclear. Balance of benefits and harms cannot be determined because of no evidence, insufficient evidence, unclear evidence, or conflicting evidence, but the committee thought it was important to provide clinical guidance and make a recommendation. Further research is recommended in this area.
N	No Recommendation for or against (“There is insufficient evidence or evidence is unclear or conflicting.”) Net benefit is unclear. Balance of benefits and harms cannot be determined because of no evidence, insufficient evidence, unclear evidence, or conflicting evidence, and the committee thought no recommendation should be made. Further research is recommended in this area.