Proposed Changes to Existing Measure for HEDIS®[1] MY 2020
Controlling High Blood Pressure (CBP)

NCQA seeks comments on proposed updates to the HEDIS *Controlling High Blood Pressure (CBP)* measure:

- Revise the time frame to look for a diagnosis of hypertension in the first six months of the measurement year and the year prior to the measurement year.

The current measure assesses adults 18–85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90 mm Hg) during the measurement year. NCQA received feedback from health plans that the current structure of the denominator allows some patients to qualify close to the end of the measurement year, potentially leaving providers and health plans insufficient time to get their blood pressure under control.

In response to this feedback, NCQA proposes restructuring the denominator to allow a minimum six-month window for interventions that will help control members' blood pressure during the measurement year. The numerator will continue to assess the most recent blood pressure reading on or after the date of the second qualifying denominator event.

NCQA advisory panels support the time frame revision and agree that incorporating the minimum six-month window will be more actionable for patients' care teams.

Supporting documents for this measure include the draft measure specification, evidence workup and performance data.

NCQA acknowledges the contributions of the Cardiovascular Measurement Advisory Panel and the Technical Measurement Advisory Panel.

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

©2020 National Committee for Quality Assurance

Controlling High Blood Pressure (CBP)

SUMMARY OF CHANGES TO HEDIS MEASUREMENT YEAR 2020

- Revised the time frame for the denominator to look for two outpatient visits with a diagnosis of hypertension in the first six months of the measurement year and the year prior to the measurement year.
- Removed the *Note* from the Exclusions to allow use of supplemental data.

Description

The percentage of members 18–85 years of age who had a diagnosis of hypertension (HTN) and whose BP was adequately controlled (<140/90 mm Hg) during the measurement year.

Definitions

Adequate control	Both a representative systolic BP of <140 mm Hg and a representative diastolic BP of <90 mm Hg.
Representative BP	The most recent BP reading during the measurement year on or after the second diagnosis of hypertension. If multiple BP measurements occur on the same date or are noted in the chart on the same date, use the lowest systolic and lowest diastolic BP reading. If no BP is recorded during the measurement year, assume that the member is "not controlled."

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid, Medicare (report each product line separately).
Ages	18–85 years as of December 31 of the measurement year.
Continuous enrollment	The measurement year.
Allowable gap	No more than one gap in continuous enrollment of up to 45 days during the measurement year. 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 (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	December 31 of the measurement year.
Benefit	Medical.
Event/diagnosis	Members who had at least two visits on different dates of service with a diagnosis of hypertension during ~~the measurement year~~ the first six months of the measurement year or the year prior to the measurement year (count services that occur over both years). Visit type need not be the same for the two visits. Any of the following code combinations meet criteria: • Outpatient visit (Outpatient Without UBREV Value Set) with any diagnosis of hypertension (Essential Hypertension Value Set).

©2020 National Committee for Quality Assurance

- A telephone visit (Telephone Visits Value Set) with any diagnosis of hypertension (Essential Hypertension Value Set).
- An online assessment (Online Assessments Value Set) with any diagnosis of hypertension (Essential Hypertension Value Set).

Only one of the two visits may be a telephone visit, an online assessment or an outpatient telehealth visit. Identify outpatient telehealth visits by the presence of a telehealth modifier (Telehealth Modifier Value Set) or the presence of a telehealth POS code (Telehealth POS Value Set) associated with the outpatient visit.

Exclusions

Exclude members who meet any of the following criteria:

~~***Note:*** *Supplemental and medical record data may not be used for these exclusions.*~~

- Medicare members 66 years of age and older as of December 31 of the measurement year who meet either of the following:
  - Enrolled in an Institutional SNP (I-SNP) any time during the measurement year.
  - Living long-term in an institution any time during the measurement year 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 year.
- Members 66–80 years of age as of December 31 of the measurement year (all product lines) with frailty ***and*** advanced illness. Members must meet *both* of the following frailty and advanced illness criteria to be excluded:
  1. At least one claim/encounter for frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.
  2. Any of the following during the measurement year or the year prior to the measurement year (count services that occur over both years):
     - At least two outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), ED visits (ED Value Set), nonacute inpatient encounters (Nonacute Inpatient Value Set) or nonacute inpatient discharges (instructions below) on different dates of service, with an advanced illness diagnosis (Advanced Illness Value Set). Visit type need not be the same for the two visits. To identify a nonacute inpatient discharge:
       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 discharge date for the stay.
     - At least one acute inpatient encounter (Acute Inpatient Value Set) with an advanced illness diagnosis (Advanced Illness Value Set).
     - At least one acute inpatient discharge with an advanced illness diagnosis (Advanced Illness Value Set). To identify an acute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).

©2020 National Committee for Quality Assurance

3. Identify the discharge date for the stay.

– A dispensed dementia medication (Dementia Medications List).

- Members 81 years of age and older as of December 31 of the measurement year (all product lines) with frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.

Dementia Medications

Description	Prescription
Cholinesterase inhibitors	• Donepezil • Galantamine • Rivastigmine
Miscellaneous central nervous system agents	• Memantine

Administrative Specification

Denominator The eligible population.

Numerator Identify the most recent BP reading (Systolic Blood Pressure Value Set; Diastolic Blood Pressure Value Set) taken during an outpatient visit (Outpatient Without UBREV Value Set), a nonacute inpatient encounter (Nonacute Inpatient Value Set), or remote monitoring event (Remote Blood Pressure Monitoring Value Set) during the measurement year.

The BP reading must occur *on or after* the date of the second diagnosis of hypertension (identified using the event/diagnosis criteria).

The member is numerator compliant if the 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 year or if the reading is incomplete (e.g., the systolic or diastolic level is missing). 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.

Organizations that use CPT Category II codes to identify numerator compliance for this indicator must search for all codes in the following value sets and use the most recent codes during the measurement year to determine numerator compliance for both systolic and diastolic levels.

Value Set	Numerator Compliance
Systolic Less Than 140 Value Set	Systolic compliant
Systolic Greater Than or Equal To 140 Value Set	Systolic not compliant
Diastolic Less Than 80 Value Set	Diastolic compliant
Diastolic 80–89 Value Set	Diastolic compliant
Diastolic Greater Than or Equal To 90 Value Set	Diastolic not compliant

CPT® is trademarked and copyright 2019 by the American Medical Association. All rights reserved.

Exclusions *(optional)*

- Exclude from the eligible population all members with evidence of end-stage renal disease (ESRD) (ESRD Diagnosis Value Set), dialysis (Dialysis Procedure Value Set), nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set; History of Kidney Transplant Value Set) on or prior to December 31 of the measurement year.
- Exclude from the eligible population female members with a diagnosis of pregnancy (Pregnancy Value Set) during the measurement year.
- Exclude from the eligible population all members who had a nonacute inpatient admission during the measurement year. 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.

Hybrid Specification

Denominator

A systematic sample drawn from the eligible population. The organization may reduce the sample size using the prior year's audited, product-line-specific rate. Refer to the to the *Guidelines for Calculations and Sampling* for information on reducing the sample size.

Identifying the medical record

All eligible BP measurements recorded in the record must be considered. If an organization cannot find the medical record, the member remains in the measure denominator and is considered noncompliant for the numerator.

Use the following guidance to find the appropriate medical record to review.

- Identify the member's PCP.
- If the member had more than one PCP for the time-period, identify the PCP who most recently provided care to the member.
- If the member did not visit a PCP for the time-period or does not have a PCP, identify the practitioner who most recently provided care to the member.
- If a practitioner other than the member's PCP manages the hypertension, the organization may use the medical record of that practitioner.

Numerator

The number of members in the denominator whose most recent BP (both systolic and diastolic) is adequately controlled during the measurement year. For a member's BP to be controlled the systolic and diastolic BP must be <140/90 mm Hg (adequate control). To determine if a member's BP is adequately controlled, the representative BP must be identified.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record

Identify the most recent BP reading noted during the measurement year.

The BP reading must occur on or after the date when the second diagnosis of hypertension (identified using the event/diagnosis criteria) occurred.

Do not include BP readings:

- Taken during an acute inpatient stay or an ED visit.

©2020 National Committee for Quality Assurance

- Taken on the same day as a diagnostic test or diagnostic or therapeutic procedure that requires a change in diet or change in medication on or one day before the day of the test or procedure, with the exception of fasting blood tests.
- Reported by or taken by the member.

BP readings from remote monitoring devices that are digitally stored and transmitted to the provider may be included. There must be documentation in the medical record that clearly states the reading was taken by an electronic device, and results were digitally stored and transmitted to the provider, and interpreted by the provider.

Note: *Member-reported results to the provider from a remote monitoring device are not acceptable.*

Identify the lowest systolic and lowest diastolic BP reading from the most recent BP notation in the medical record. If multiple readings were recorded for a single date, use the lowest systolic and lowest diastolic BP on that date as the representative BP. The systolic and diastolic results do not need to be from the same reading.

The member is not compliant if the BP reading is ≥140/90 mm Hg or is missing, if there is no BP reading during the measurement year or if the reading is incomplete (e.g., the systolic or diastolic level is missing).

Exclusions *(optional)*

Refer to the *Administrative Specification* for exclusion criteria. Exclusionary evidence in the medical record must include a note indicating diagnosis of pregnancy or evidence of a nonacute inpatient admission during the measurement year, ***or*** evidence of ESRD, dialysis, nephrectomy or kidney transplant any time during the member's history through December 31 of the measurement year.

Note

- *When identifying the most recent BP reading, all eligible BP readings in the appropriate medical record should be considered, regardless of practitioner type and setting (excluding acute inpatient and ED visit settings).*
- *An EMR can be used to identify the most recent BP reading if it meets the criteria for appropriate medical record.*
- *When excluding BP readings from the numerator, the intent is to identify diagnostic or therapeutic procedures that require a medication regimen, a change in diet or a change in medication. For example (this list is just for reference, and is not exhaustive):*
  - *A colonoscopy requires a change in diet (NPO on the day of procedure) and a medication change (a medication is taken to prep the colon).*
  - *Dialysis, infusions and chemotherapy (including oral chemotherapy) are all therapeutic procedures that require a medication regimen.*
  - *A nebulizer treatment with albuterol is considered a therapeutic procedure that requires a medication regimen (the albuterol).*
  - *A patient forgetting to take regular medications on the day of the procedure is not considered a required change in medication, and therefore the BP reading is eligible.*
- *BP readings taken on the same day that the member receives a common low-intensity or preventive procedure are eligible for use. For example, the following procedures are considered common low-intensity or preventive (this list is just for reference, and is not exhaustive):*
  - *Vaccinations.*

- *Injections (e.g., allergy, vitamin B-12, insulin, steroid, toradol, Depo-Provera, testosterone, lidocaine).*
- *TB test.*
- *IUD insertion.*
- *Eye exam with dilating agents.*
- *Wart or mole removal.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table CBP-1/2/3: Data Elements for Controlling High Blood Pressure

	Admin	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical record data records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

©2020 National Committee for Quality Assurance

Controlling High Blood Pressure (CBP)
Measure Workup

Topic Overview

Importance and Prevalence

*** *The American College of Cardiology (ACC) and the American Heart Association (AHA) released an updated guideline in 2017 that redefined high blood pressure (high blood pressure) as ≥130/80 mm Hg (Whelton et al, 2017). The 2019 update of the Heart Disease and Stroke Statistics report (Benjamin et al, 2019), as cited in this workup, references this new definition. However, a majority of the citations in this workup are dated before the new ACC/AHA guideline and reference the previous definition of high blood pressure as ≥140/90 mm Hg.* ***

High blood pressure, also known as hypertension, occurs when the pressure in blood vessels is higher than normal (CDC, 2017). The causes of hypertension are multiple and multifaceted and can be based on genetic predisposition, environmental risk factors, being overweight and obese, sodium intake, potassium intake, physical activity, and alcohol use. High blood pressure is common; according to the American Heart Association, from 2013–2016, approximately 116.4 million U.S. adults ≥20 years of age had high blood pressure and the prevalence of hypertension among adults 65 and older was 78.2% (Benjamin et al, 2019).

High blood pressure, known as the "silent killer," increases risks of heart disease and stroke, which are two of the leading causes of death in the U.S. (Yoon, 2015). A person who has high blood pressure is four times more likely to die from a stroke and three times more likely to die from heart disease (CDC, 2012) The National Vital Statistics Systems reported that in 2014 there were approximately 73,300 deaths directly due to high blood pressure and 410,624 deaths with any mention of high blood pressure (CDC, 2014). Between 2006 and 2016 the number of deaths due to high blood pressure rose by 46.3% (Benjamin et al, 2019). Managing and treating high blood pressure would reduce cardiovascular disease mortality for males by 30.4% and by 38.0% for females (Patel et al., 2015).

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 SBP/DBP of 130 to 139/85 to 89 mm Hg, 49.5% of adults 65–94 years of age developed hypertension, compared with 37.3% of adults 35–64 (Vasan, 2001). Among various races, Blacks have the highest prevalence of hypertension across the world (Benjamin et al, 2019). Between 2013 and 2016 the prevalence of hypertension for adults ≥20, among non-Hispanic Black males and females, was 58.6% and 56.0%; among non-Hispanic White males and females, 48.2% and 41.3%; among non-Hispanic Asian males and females, 46.4% and 36.4%; and among Hispanic males and females, 47.4 and 40.8%, respectively (Benjamin et al, 2019).

Financial importance and cost-effectiveness

The estimated annual average direct and indirect cost of high blood pressure from 2014–2015 was $55.9 billion (Benjamin et al, 2019). Total direct costs of high blood pressure is projected to increase to $220.9 billion by 2035 (AHA Benjamin et al, 2019). A study on cost-effectiveness on treating hypertension found that controlling high blood pressure in patients with cardiovascular disease and systolic blood pressures of ≥160 mm Hg could be effective and cost-saving (Moran, 2015).

Hypertension was the primary cause of approximately 3.7 million hospital outpatient visits in 2011 and about 1.2 million ED visits in 2015 (Benjamin et al, 2019).

©2020 National Committee for Quality Assurance

Supporting Evidence for Controlling High Blood Pressure

Despite varying definitions and treatment recommendations by different organizations, all guidelines agree that controlling high blood pressure will significantly reduce the risks of cardiovascular disease mortality and lead to better health outcomes such as reduction of heart attacks, strokes and kidney disease (James et al, 2014).

Many studies have shown that controlling high blood pressure 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 with an SBP goal of <140 mm Hg among patients 50 and older with established cardiovascular disease, and found that patients with the first goal had reduced cardiovascular events and mortality. The study also found that patients with a blood pressure of ≥130 mm Hg had increased cardiovascular risk (SPRINT, 2015).

Results from SPRINT do not apply to patients with diabetes because that population was excluded from the study; however, a number of other studies have shown reduction of cardiovascular events and microvascular complications when patients with diabetes are treated to a blood pressure target of <140/90 mmHg (Emdin et al., 2015; Arguedas et al., 2013; Ettehad et al., 2016; Brunstrom et al 2016; Bangalore et al., 2011, Thomopoulos et al., 2017; Xie et al., 2016). Among those studies, one of the strongest sources of evidence for controlling blood pressure in patients with diabetes is Action to Control Cardiovascular Risk in Diabetes Blood Pressure (ACCORD BP). This randomized control trial compared intensive SBP control at <120 mmHg to standard SBP control at <140 mmHg and found that intensive goals reduce the risk of stroke—but potentially at the expense of increased adverse events—but do not reduce total major atherosclerotic cardiovascular events (Cushman et al., 2010). Given these results, the ACCORD BP suggests that treating patients to a target BP of <140/90 mmHg may be appropriate for patients with diabetes (Cushman et al., 2010).

Therapeutic options

There are nonpharmacological and pharmacological options to prevent and control high blood pressure. Nonpharmacological options are life style changes that patients with elevated or high blood pressure can make; these include weight loss, dietary changes (reducing sodium intake and increasing potassium intake), increasing physical activity, reducing the consumption of alcohol and quitting smoking (CDC, 2016; Eckel et al, 2013; Whelton et al, 2017).

When nonpharmacological options alone do not control a patient's high blood pressure, physicians may choose to prescribe medications, along with continued nonpharmacological approaches (James et al, 2014; Whelton et al, 2017). Pharmacological treatment is prescribed based on the patient's blood pressure level, age, cardiovascular risk factors and other existing comorbidities such as chronic kidney disease (James et al, 2014; Whelton et al, 2017).

Recommendations for the first line of 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). If a patient is still not reaching goals, the physician can add additional medication classes (e.g., beta-blocker, aldosterone antagonist) to achieve the targets (James et al., 2014).

Health care disparities

There are disparities in awareness, treatment and control of hypertension. NHANES data from 2013–2016 showed that of people ≥20 years of age with hypertension, 64.7% were aware of their condition, 53.4% were under current treatment and 24.7% had it under control (Benjamin et al, 2019). When comparing races, non-Hispanic Whites and Blacks are more aware of their hypertension than Hispanic and non-Hispanic Asian adults (Benjamin et al, 2019).

Based on Medicare Advantage data in 2017, the percentage of adequately controlled blood pressure for hypertensive adults 18–85 among Asian or Pacific Islander beneficiaries, was 69.4%; 68.6% among non-Hispanic White beneficiaries; 66.7%

among Hispanic beneficiaries; and 58.9% among non-Hispanic Black beneficiaries (CMS, 2019).

Older adults are more likely to be aware and receive treatment for their hypertension. An average of 54.4% of adults ≥40 had their hypertension in control, compared to 10.2% of adults from 20–39 years of age (Benjamin et al, 2019).

Gaps in care

Over the past three years of HEDIS data, commercial, Medicare and Medicaid product lines have shown a slight decrease in performance of controlling high blood pressure, which indicates widespread gaps in care and continued room for improvement. The average performance from 2015–2017 is 59% for commercial plans, 69% for Medicare plans and 56% for Medicaid plans.

References

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

Arguedas, J.A., V. Leiva, J.M. Wright. 2013. "Blood Pressure Targets for Hypertension in People With Diabetes Mellitus." *Cochrane Database Syst Rev* 10:CD008277.

Bangalore, S., S. Kumar, I. Lobach, F.H. Messerli. 2011. "Blood Pressure Targets in Subjects With Type 2 Diabetes Mellitus/Impaired Fasting Glucose: Observations From Traditional and Bayesian Random Effects Meta-Analyses of Randomized Trials." *Circulation* 123:2799–2810.

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.

Brunstrom, M., B. Carlberg. 2016. "Effect of Antihypertensive Treatment at Different Blood Pressure Levels in Patients With Diabetes Mellitus: Systematic Review and Meta-Analyses." *BMJ* 352: i717.

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 (CDC), National Center for Health Statistics. 2014. Mortality Multiple Cause Micro-Data Files: Public-Use Data File and Documentation: NHLBI Tabulations. http://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm#Mortality_Multiple

CDC. 2012. *Vital signs: Getting Blood Pressure Under Control.* https://www.cdc.gov/vitalsigns/hypertension/index.html

Centers for Medicare & Medicaid Services: Office of Minority Health in collaboration with the RAND Corporation. 2019. *Racial, Ethnic, and Gender Disparities in Health Care in Medicare Advantage.* 1–150.

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.

Cushman, W.C., G.W. Evans, R.P. Byington, et al. 2010. "ACCORD Study Group. Effects of Intensive Blood Pressure Control in Type 2 Diabetes Mellitus." *N Engl J Med* 362:1575–85.

Eckel, RH, Jakicic JM, Ard JD, et al. 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*. 2013. doi:10.1161/01.cir.0000437740.48606.d1.

Emdin, C.A., K. Rahimi, B. Neal, T. Callender, V. Perkovic, A. Patel. 2015. "Blood Pressure Lowering in type 2 Diabetes: A Systematic Review and Meta-Analysis." *JAMA* 313:603–15.

Ettehad, D., C.A. Emdin, A. Kiran, et al. 2016. "Blood Pressure Lowering for Prevention of Cardiovascular Disease and Death: A Systematic Review and Meta-Analysis." *Lancet* 387:957–67.

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.

Moran, A.E., M.C. Odden, A. Thanataveerat, K.Y. Tzong, P.W. Rasmussen, D. Guzman, L. Williams, K. Bibbins-Domingo, P.G. Coxson, L. Goldman. 2015. "Cost-Effectiveness of Hypertension Therapy According to 2014 Guidelines [published correction appears in *N Engl J. Med*. 2015;372:1677]. *N Engl J Med* 372:447–55. doi: 10.1056/NEJMsa1406751.

Patel, S.A., Winkel M, Ali MK, Narayan KM, Mehta NK. Cardiovascular mortality associated with 5 leading risk factors: national and state preventable fractions estimated from survey data. *Ann Intern Med*. 2015;163:245–253. doi: 10.7326/M14-1753.

SPRINT Research Group; Wright, J.T. Jr., J.D. Williamson, P.K. Whelton, J.K. Snyder, K.M. Sink, M.V. Rocco, D.M. Reboussin, M. Rahman, S. Oparil, C.E. Lewis, P.L. Kimmel, K.C. Johnson, D.C. Goff Jr., L.J. Fine, J.A. Cutler, W.C. Cushman, A.K. Cheung, W.T. Ambrosius. 2015. "A Randomized Trial of Intensive Versus Standard Blood-Pressure Control." *N Engl J Med* 373:2103–116.

Thomopoulos, C., G. Parati, A. Zanchetti. 2017. "Effects of Blood-Pressure-Lowering Treatment on Outcome Incidence in Hypertension: 10—Should Blood Pressure Management Differ in Hypertensive Patients With and Without Diabetes Mellitus? Overview and Meta-Analyses of randomized Trials." *J Hypertens* 35:922–44.

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* 358:1682–6. doi: 10.1016/S0140-6736(01)06710-1.

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

Yoon, S.S., C.D. Fryar, M.D. Carroll. 2015. *Hypertension Prevalence and Control Among Adults: United States, 2011–2014.* NCHS data brief, no 220. Hyattsville, MD: National Center for Health Statistics.

Xie, X., E. Atkins, J. Lv, et al. 2016. "Effects of Intensive Blood Pressure Lowering on Cardiovascular and Renal Outcomes: Updated Systematic Review and Meta-Analysis." *Lancet* 387:435–43.

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 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
	Hypertensive adults after kidney transplant	<130	<80	COR IIa SBP Level of evidence B-NR DBP Level of evidence C-EO
	Hypertensive adults with diabetes	<130	<80	COR I SBP Level of evidence B-R SR 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 Diabetes Association, 2018	General hypertensive population with diabetes	<140	<90	A

©2020 National Committee for Quality Assurance

Organization, Year	Population	Systolic Blood Pressure Target Recommendation (mmHg)	Diastolic BP Target Recommendation (mmHg)	Grade of Recommendation
	Hypertensive and diabetic patients with high risk for cardiovascular disease	<130	<80	C
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
	Population 18 and older with diabetes	<140	<90	E

©2020 National Committee for Quality Assurance

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 • Associated with excess morbidity/mortality • Should not be performed/administered other

Level (Quality) of Evidence

Level	Definition

©2020 National Committee for Quality Assurance

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

American Diabetes Association evidence-grading system for "Standards of Medical Care in Diabetes"

Level of Evidence	Definition
A	• Clear evidence from well-conducted, generalizable randomized controlled trials that are adequately powered, including: – Evidence from a well-conducted multicenter trial. – Evidence from a meta-analysis that incorporated quality ratings in the analysis. • Compelling nonexperimental evidence (i.e., "all or none" rule developed by the Centre for Evidence-Based Medicine at the University of Oxford). • Supportive evidence from well-conducted randomized controlled trials that are adequately powered, including: – Evidence from a well-conducted trial at one or more institutions. – Evidence from a meta-analysis that incorporated quality ratings in the analysis.
B	• Supportive evidence from well-conducted cohort studies: – Evidence from a well-conducted prospective cohort study or registry. – Evidence from a well-conducted meta-analysis of cohort studies. • Supportive evidence from a well-conducted case-control study.
C	• Supportive evidence from poorly controlled or uncontrolled studies. • Evidence from randomized clinical trials with one or more major or three or more minor methodological flaws that could invalidate the results. • Evidence from observational studies with high potential for bias (such as case series with comparison with historical controls). • Evidence from case series or case reports Conflicting evidence with the weight of evidence supporting the recommendation.
E	• Expert consensus or clinical experience.

America College of Physicians' Guideline Grading System

Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks	Benefits Finely Balanced

©2020 National Committee for Quality Assurance

	and Burden or Risks and Burden Clearly Outweigh Benefits	with Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

Eight Report of the Joint National Committee—Evidence Quality Rating

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

©2020 National Committee for Quality Assurance

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.
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.

©2020 National Committee for Quality Assurance

HEDIS Health Plan Performance Rates: Controlling High Blood Pressure

Table 1. HEDIS CBP Measure Performance—Commercial Plans

Measurement Year	Total Number of Plans (N)	Number of Plans Reporting (N (%))	Performance Rates (%)						
			Mean	Standard Deviation	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile
2018*	405	403 (99.5)	54.7	20.9	9.1	52.1	59.9	67.2	73.7
2017	406	350 (86.2)	58.5	11.7	44.3	51.1	57.8	66.4	74.7
2016	420	352 (83.8)	58.7	11.8	44.5	49.9	57.4	67.7	75.2

*For 2018 the average denominator across plans was 2,969 individuals, with a standard deviation of 17,889.

Table 2. HEDIS CBP Measure Performance—Medicaid Plans

Measurement Year	Total Number of Plans (N)	Number of Plans Reporting (N (%))	Performance Rates (%)						
			Mean	Standard Deviation	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile
2018*	256	248 (96.9)	58.9	12.5	45.5	52.7	60.9	66.9	72.3
2017	275	264 (96.0)	56.9	12.7	41.6	49.3	58.7	65.7	71.0
2016	282	259 (91.8)	56.5	12.1	39.9	47.7	56.9	64.8	71.7

*For 2018 the average denominator across plans was 681 individuals, with a standard deviation of 1,761.

Table 3. HEDIS CBP Measure Performance—Medicare Plans

Measurement Year	Total Number of Plans (N)	Number of Plans Reporting (N (%))	Performance Rates (%)						
			Mean	Standard Deviation	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile
2018*	525	483 (92.0)	69.5	10.6	57.2	64.2	70.8	75.9	80.8
2017	505	460 (91.1)	71.1	13.9	53.5	62.8	74.4	80.4	86.0
2016	506	466 (92.1)	69.6	13.5	50.8	61.3	70.8	80.7	84.2

*For 2018 the average denominator across plans was 1,082 individuals, with a standard deviation of 11,990.

©2020 National Committee for Quality Assurance