

Client	HEALTH BENCHMARKS, INC. STANDARD ALGORITHM		
Measure Title	APPROPRIATE MONITORING FOR DIURETICS		
Disease State	Multiple Conditions	Indicator Classification¹	Medication Monitoring
Strength of Recommendation²	B		
Organizations Providing Recommendation	Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, Seventh Report		
Clinical Intent	To ensure that all members who received diuretics receive appropriate laboratory monitoring at least annually.		
Background	<p>Disease Burden</p> <ul style="list-style-type: none"> • Hypertension is the most frequently reported primary diagnosis for office visits of non-pregnant adults to physicians in the United States, accounting for approximately 17.2 million visits per year.[1] • According to the Seventh Report of the Joint National Committee (JNC) on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII) guidelines, approximately 60% of adults in the United States have either hypertension (SBP > 140 mm Hg or DBP > 90 mm Hg) or pre-hypertension (SBP of 120 to 139 mm Hg or DBP of 80 to 89 mm Hg).[2] • Thiazide-type diuretics have been recommended as the preferred initial agent for pharmacological treatment of high blood pressure.[2] • Diuretics are also indicated for edema.[3] <p>Reason for Indicated Intervention or Treatment</p> <ul style="list-style-type: none"> • Although well tolerated, especially in modest doses, diuretics may cause electrolyte abnormalities such as hyper or hypokalemia.[4-7] These electrolyte abnormalities can lead to fatal arrhythmias and death • Diuretics work by increasing or decreasing the excretion of potassium, chloride, calcium, bicarbonate, or magnesium. Consequently, electrolyte and acid-base disorders can accompany diuretic use.[6, 8] 		
Clinical Recommendations	<ul style="list-style-type: none"> • JNC VII guidelines states that “serum potassium and creatinine should be monitored at least one to two times per year after initiating antihypertensive therapy.”[9] 		
Source	Healthcare Effectiveness Data and Information Set (HEDIS®) 2009 Technical Specification for Physician Measurement		

Denominator

Denominator Definition Continuously enrolled members ages 18 years or older by the end of the measurement year who received at least a 180 day supply of diuretics during the measurement year.

Note: Members may switch therapy within any medication listed in diuretic_den_medlist_2009_v1.xls during the measurement year and have the days supply for those medications count towards the total 180 days supply.

Denominator Index Date N/A

Denominator Encounters/Claims Criteria Drug list: Antihypertensive combinations, loop diuretics, potassium sparing diuretics, thiazide diuretics

Denominator Exclusion

Denominator Exclusion Definition Members who had an acute/nonacute inpatient stay during the measurement year.

Denominator Exclusion Claims Criteria ICD-9 diagnosis code(s): Any *primary* diagnosis code. Acceptable range: 001.xx-999.8x, E800.x-E999.x, V01.x-V89.x

UB Type of Bill code(s): 11x, 12x, 41x, 84x

CPT-4 code(s): 99217-99220, 99221-99223, 99231-99233, 99234-99236
99238-99239, 99251-99255, 99261-99263, 99291-99300, 99356-99357, 99431-99440

UB revenue code(s): 0100-0114, 0115, 0117, 0118, 019x, 0121-0123, 0125, 0127, 0128, 0131-0133, 0135, 0137, 0138, 0141-0143, 0145, 0147, 0148, 0151-0153, 0155, 0157, 0158, 0200-0219, 0220-0229, 0650, 0655, 0656, 0658, 0659, 0720-0729, 0800-0809, 0987, 1001, 1002

UB type of bill code(s): 18x, 21x, 22x, 81x, 82x

Place of service code(s): 31, 32, 34, 54, 55, 56, 61

HCPCS code(s): H0017-H0019, T2048

Numerator

Numerator Definition Members who received at least 1 serum potassium test and either a serum creatinine test or a blood urea nitrogen therapeutic monitoring test during the measurement year.

Numerator Claims Criteria CPT-4 code(s): 80047, 80048, 80050, 80051, 80053, 80069, 82565, 82575, 84132, 84520, 84525

LOINC code(s): 2160-0, 2163-4, 2164-2, 2824-1, 2823-3, 3094-0, 6298-4, 6299-2, 11041-1, 11042-9, 11064-3, 11065-0, 12195-4, 12812-4, 12813-2, 12964-3, 12965-0, 12966-8, 13441-1, 13442-9, 13443-7, 13446-0, 13447-8, 13449-4, 13450-2, 14682-9, 14937-7, 16188-5, 16189-3, 21232-4, 22760-3, 24320-4, 24321-2, 24322-0, 24323-8, 24326-1, 24323-8, 24362-6, 26752-6, 29349-8, 31045-8, 32713-0, 33558-8, 34548-8, 34554-6, 34555-3, 35203-9, 35591-7, 35592-5, 35593-3, 35594-1, 38483-4, 39789-3, 39790-1, 39955-0, 39956-8, 39957-6, 39958-4, 39959-2, 39960-0, 39961-8, 39962-6, 39963-4, 39964-2, 39965-9, 39966-7, 39967-5, 39968-3, 39969-1, 39970-9, 39971-7, 39972-5, 39973-3, 39974-1, 39975-8, 39976-6, 40112-5, 40113-3, 40114-1, 40115-8, 40116-6, 40117-4, 40118-2, 40119-0, 40120-8, 40121-6, 40122-4, 40123-2, 40124-0, 40125-7, 40126-5, 40127-3, 40128-1, 40248-7, 40249-5, 40250-3, 40251-1, 40252-9, 40253-7, 40254-5, 40255-2, 40256-0, 40257-8, 40258-6, 40264-4, 40265-1, 40266-9, 40267-7, 40268-5, 40269-3, 40270-1, 40271-9, 40272-7, 40273-5, 41656-0, 44734-2, 44784-7, 45064-3, 45065-0, 45066-8, 49071-4, 50261-7, 50380-5, 50381-3, 51619-5, 51620-3, 51618-7 (if available)

Physician Attribution

Physician Attribution Description

If client data contains prescribing provider:

Score the physician(s) (in the selected specialties) who prescribed the member a denominator medication.

If client data does not contain prescribing provider:

Score all physicians (in the appropriate specialties) who saw the member during the measurement year

References

1. Woodwell, et al., *National Ambulatory Medical Care Survey: 2002 summary*. Adv Data, 2004(346): p. 1-44.
2. Chobanian, A.V., et al., *Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. Hypertension, 2003. **42**(6): p. 1206-52.
3. Greenberg and A., *Diuretic complications*. Am J Med Sci, 2000. **319**(1): p. 10-24.
4. Siegel, D., et al., *Diuretics, serum and intracellular electrolyte levels, and ventricular arrhythmias in hypertensive men*. Jama, 1992. **267**(8): p. 1083-9.
5. Clayton, et al., *Thiazide diuretic prescription and electrolyte abnormalities in primary care*. Br J Clin Pharmacol, 2006. **61**(1): p. 87-95.
6. Rosenberg, et al., *Combination therapy with metolazone and loop diuretics in outpatients with refractory heart failure: an observational study and review of the literature*. Cardiovasc Drugs Ther, 2005. **19**(4): p. 301-6.
7. Greenberg, A., *Diuretic complications*. Am J Med Sci, 2000. **319**(1): p. 10-

- 24.
8. Chobanian, et al., *Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. Hypertension, 2003. **42**(6): p. 1206-52.

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1. Woodwell, et al., *National Ambulatory Medical Care Survey: 2002 summary*. Adv Data, 2004(346): p. 1-44.
2. Chobanian, A.V., et al., *Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. Hypertension, 2003. **42**(6): p. 1206-52.
3. Kluwer, W., *Facts & Comparisons*. 2009, Wolters Kluwer Health.
4. Greenberg and A., *Diuretic complications*. Am J Med Sci, 2000. **319**(1): p. 10-24.
5. Siegel, D., et al., *Diuretics, serum and intracellular electrolyte levels, and ventricular arrhythmias in hypertensive men*. Jama, 1992. **267**(8): p. 1083-9.
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9. Chobanian, et al., *Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. Hypertension, 2003. **42**(6): p. 1206-52.

¹ **Indicator Classification** (Adapted from HEDIS® technical specifications)

Diagnosis	Measures applicable to patients receiving diagnostic workups for a symptom or condition that delineate appropriate laboratory or radiological testing to be performed (e.g. evaluation of thyroid nodule; pregnancy test in patients with vaginal bleeding or abdominal pain)
Effectiveness of Care	
Prevention	Measures applicable to asymptomatic individuals that are designed to prevent the onset of the targeted condition (e.g. immunizations).
Screening	Measures applicable to asymptomatic patients who have risk factors or pre-clinical disease, but in whom the condition has not become clinically apparent (e.g. pap smears; screening for elevated blood pressure).
Disease Management	Measures applicable to individuals diagnosed with a condition that are part of the treatment or management of the condition (e.g. cholesterol reduction in patients with diabetes; radiation therapy following breast conserving surgery; appropriate follow-up after acute event).
Medication Monitoring	Measures applicable to patients taking medications with narrow therapeutic windows and / or potential preventable significant side effects or adverse reactions (e.g. thyroid stimulating hormone (TSH) testing after levothyroxine dose change; hepatic enzyme monitoring for patients using antimycotic pharmacotherapy)
Medication Adherence	Measures applicable to patients taking medications for chronic conditions that are designed to assess patient adherence to medication (e.g. adherence to lipid lowering medication).

Utilization Measures applicable to patients receiving treatment for a symptom or condition that advocate appropriate utilization of laboratory and pharmaceutical resources (e.g. conservative use of imaging for low back pain; inappropriate use of antibiotics for viral upper respiratory infection).

² **Strength of Recommendation**

Strength of Recommendation Based on a Body of Evidence

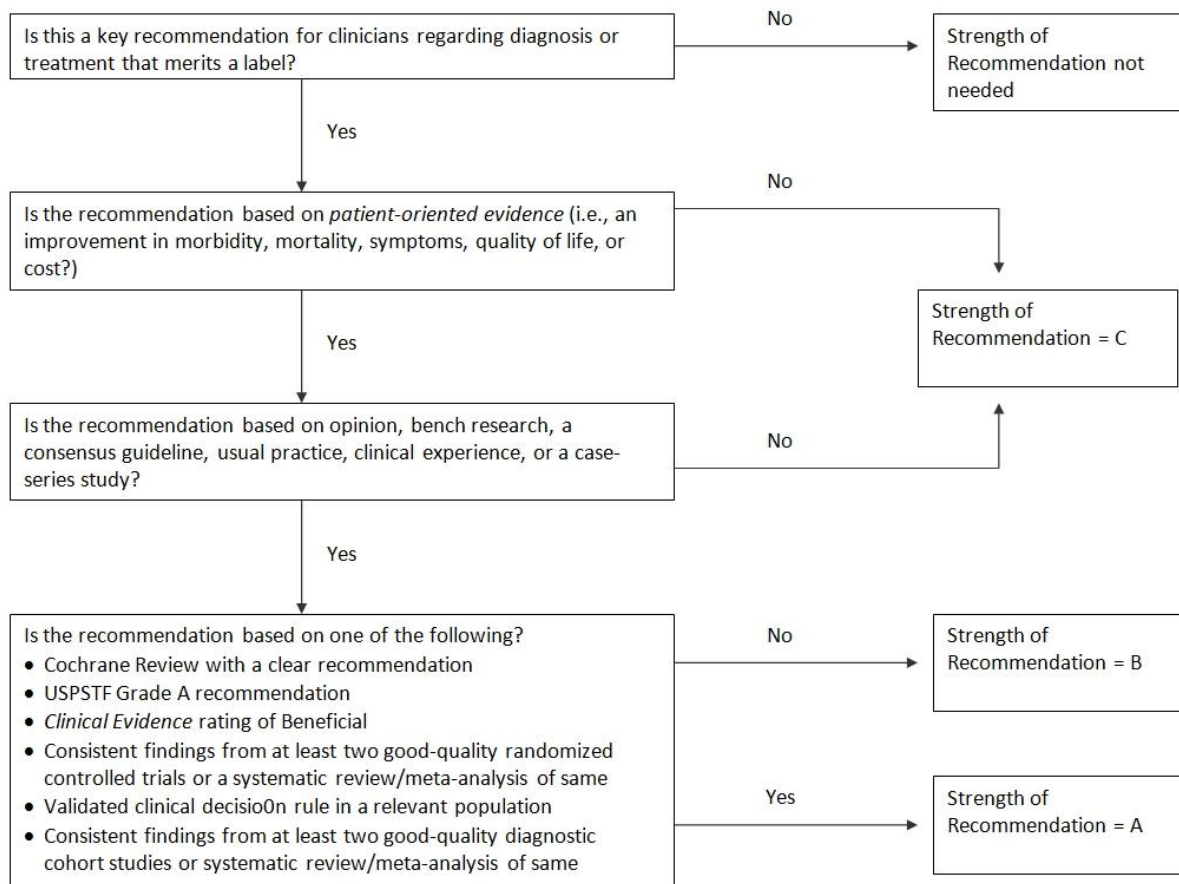


FIGURE 2. Algorithm for determining the strength of a recommendation based on a body of evidence (applies to clinical recommendations regarding diagnosis, treatment, prevention, or screening). While this algorithm provides a general guideline, authors and editors may adjust the strength of recommendation based on the benefits, harms, and costs of the intervention being recommended. (USPSTF = U.S. Preventive Services Task Force)