

<b>eMeasure Title</b>	<b>Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow-Up Plan</b>		
<b>eMeasure Identifier (Measure Authoring Tool)</b>	69	<b>eMeasure Version number</b>	5.0.000
<b>NQF Number</b>	0421	<b>GUID</b>	9a031bb8-3d9b-11e1-8634-00237d5bf174
<b>Measurement Period</b>	January 1, 20XX through December 31, 20XX		
<b>Measure Steward</b>	Centers for Medicare & Medicaid Services (CMS)		
<b>Measure Developer</b>	Quality Insights of Pennsylvania		
<b>Endorsed By</b>	National Quality Forum		
<b>Description</b>	<p>Percentage of patients aged 18 years and older with a BMI documented during the current encounter or during the previous six months AND with a BMI outside of normal parameters, a follow-up plan is documented during the encounter or during the previous six months of the current encounter</p> <p>Normal Parameters:      Age 18 years and older BMI =&gt; 18.5 and &lt; 25 kg/m2</p>		
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<b>Measure Scoring</b>	Proportion		
<b>Measure Type</b>	Process		
<b>Stratification</b>	None		
<b>Risk Adjustment</b>	None		
<b>Rate Aggregation</b>	None		
<b>Rationale</b>	<p>BMI Above Normal Parameters</p> <p>Obesity continues to be a costly public health concern in the United States. This is because obesity is associated with several comorbid health problems including increased risk for coronary artery disease, type 2 diabetes, various types of cancer, gallstones and disability. These comorbid conditions are associated with higher medical care utilization and costs among obese patients (Moyer, 2012, p. 373). Padula, Allen &amp; Nair (2014) examined data from a commercial claims and encounter database to estimate the cost for obesity and associated comorbidities between 2006-2007 and found that on the average, obesity contributed to \$1907 more in cost per patient per visit for inpatient and outpatient claims, while the increase in cost for comorbidities ranged from \$527 for obesity with congestive heart failure (CHF) to \$15, 733 for the combination of obesity, diabetes mellitus, hypertension and depression. Similarly, data from 2006 show that per capita annual medical spending costs attributable to obesity are higher by \$1,429 (42 percent) when compared to per capita costs attributable to normal weight patients. The national aggregate cost for obesity related costs (across all payers) was estimated to be equivalent to \$147 billion using 2008 dollars (Finkelstein, Trogon, Cohen &amp; Dietz, 2009). Obesity is also associated with an increased risk of death, particularly in adults younger than age 65 years and has been shown to reduce life expectancy by 6 to 20 years depending on age and race (LeBlanc et al., 2011; Masters et al., 2013)</p> <p>Against this background of high obesity related costs, CDC 2009 data showed that all states were still lagging behind the Healthy People 2010 obesity target of 15 percent and that the self-reported overall prevalence of obesity among adults had increased 1.1 percentage points in 2007 to 26.7 percent (2010). Most recent data shows that the prevalence of BMI-defined obesity in adults continues to exceed 30% (34.9 overall) and highest among middle-aged adults (34.9). The findings also revealed the prevalence of obesity being higher among black adult women (56.6%) compared with 37.1% of black adult men (Ogden, Carroll, Kit and Flegel, 2013). Despite the high obesity prevalence, and related costs, less than 50% of obese adults in 2010 received advice to exercise or perform physical activity (Barnes &amp; Schoenborn, 2012) indicating a gap in care for a high impact disease condition.</p>		

	<p>Screening for BMI and follow-up therefore is critical to closing this gap and contributes to quality goals of population health and cost reduction. However, due to concerns for other underlying conditions (such as bone health) or nutrition related deficiencies providers are cautioned to use clinical judgment and take these into account when considering weight management programs for overweight patients, especially the elderly (NHLBI Obesity Education Initiative, 1998, p. 91).</p> <p>BMI below Normal Parameters</p> <p>On the other end of the body weight spectrum is underweight (BMI &lt;18.5 kg/m<sup>2</sup>), which is equally detrimental to population health. When compared to normal weight individuals (BMI 18.5-25 kg/m<sup>2</sup>), underweight individuals have significantly higher death rates with a Hazard Ratio of 2.27 and 95% confidence intervals (CI) = 1.78, 2.90 (Borrell &amp; Lalitha (2014).</p> <p>Poor nutrition or underlying health conditions can result in underweight (Fryer &amp; Ogden, 2012). The National Health and Nutrition Examination Survey (NHANES) results from the 2007-2010 indicate that women are more likely to be underweight than men (2012). Therefore patients should be equally screened for underweight and followed up with nutritional counselling to reduce mortality and morbidity associated with underweight.</p>
<b>Clinical Recommendation Statement</b>	<p>The US Preventive Health Services Task Force (USPSTF) recommends that clinicians screen all adults (aged 18 years and older) for obesity. Clinicians should offer or refer patients with a BMI of 30 or higher to intensive, multicomponent behavioral interventions. This is a B recommendation (Moyer, 2012).</p> <p>As cited in Wilkinson et al. (2013), the Institute for Clinical Systems Improvement (ICSI) Preventive Services for Adults, Obesity Screening (Level II) Recommendation provides the following guidance:</p> <ul style="list-style-type: none"> <li>-Record height, weight and calculate body mass index at least annually <ul style="list-style-type: none"> <li>* Clinicians should consider waist circumference measurement to estimate disease risk for patients who have BMI scores indicative of overweight or obesity class I. For adult patients with a BMI of 25 to 34.9 kg/m<sup>2</sup>, sex-specific waist circumference cutoffs should be used in conjunction with BMI to identify increased disease risk.</li> </ul> </li> <li>-A BMI greater or equal to 30 is defined as obese</li> <li>-A BMI of 25-29 is defined as overweight</li> <li>-Intensive intervention for obese individuals, based on BMI, is recommended by the U.S. Preventive Services to help control weight</li> </ul> <p>Similarly, the 2013 joint report/guideline from the American Heart Association, American College of Cardiology and the Obesity Society also recommend measuring height and weight and calculating BMI at annual visits or more frequently, using the current cutpoints for overweight (BMI &gt;25.0-29.9 kg/m<sup>2</sup>) and obesity (BMI ≥30 kg/m<sup>2</sup>) to identify adults who may be at elevated risk of mortality from all causes. They also recommended counseling overweight and obese individuals on their increased risk for CVD, type 2 diabetes, and all-cause mortality, and need for lifestyle changes.</p> <p>Nutritional safety for the elderly should be considered when recommending weight reduction. "A clinical decision to forego obesity treatment in older adults should be guided by an evaluation of the potential benefits of weight reduction for day-to-day functioning and reduction of the risk of future cardiovascular events, as well as the patient's motivation for weight reduction. Care must be taken to ensure that any weight reduction program minimizes the likelihood of adverse effects on bone health or other aspects of nutritional status" Evidence Category D. (NHLBI Obesity Education Initiative, 1998, p. 91). In addition, weight reduction prescriptions in older persons should be accompanied by proper nutritional counseling and regular body weight monitoring. (NHLBI Obesity Education Initiative, 1998, p. 91).</p> <p>The possibility that a standard approach to weight loss will work differently in diverse patient populations must be considered when setting expectations about treatment outcomes. Evidence Category B. (NHLBI Obesity Education Initiative, 1998).</p>
<b>Improvement Notation</b>	Higher score indicates better quality
<b>Reference</b>	Diehr P, O'Meara ES, Fitzpatrick A, Newman AB, Kuller L, Burke G. (2008) Weight, mortality, years of healthy life, and active life expectancy in older adults. <i>Journal of American Geriatrics Society</i> , 56, 76-83.
<b>Reference</b>	Donini, L. M., Savina, C., Gennaro, E., De Felice, M. R., Rosano, A., Pandolfo, M. M., ... Chumlea, W. C. (2012). A Systematic Review Of The Literature Concerning The Relationship Between Obesity And Mortality In The Elderly. <i>The Journal of Nutrition, Health &amp; Aging</i> , 16(1), 89-98.
<b>Reference</b>	Fryar, C. D., & Ogden, C. L. (2012). Prevalence of underweight among adults aged 20 and over: United States, 1960-1962 through 2007-2010. National Center for Health Statistics, Division of Health and Nutrition Examination Surveys. Retrieved from <a href="http://www.cdc.gov/nchs/data/hestat/underweight_adult_07_10/underweight_adult_07_10.pdf">http://www.cdc.gov/nchs/data/hestat/underweight_adult_07_10/underweight_adult_07_10.pdf</a>
<b>Reference</b>	Finkelstein, E.A., Trogdon, J.G., Cohen, J.W., & Dietz, W. (2009). Annual Medical Spending Attributable To Obesity: Payer-And Service-Specific Estimates. <i>Health Affairs</i> , 28(5), w822-w831. doi: 10.1377/hlthaff.28.5.w822
<b>Reference</b>	Holme, I., & Tonstad, S. (2015) Survival in elderly men in relation to midlife and current BMI. <i>Age and Ageing</i> , 44, 3, 434-9.
<b>Reference</b>	Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2013). Prevalence of obesity among adults: United States, 2011-2012, Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS) Data Brief, No. 131: Oct 2013. Retrieved from <a href="http://www.cdc.gov/nchs/data/databriefs/db131.pdf">http://www.cdc.gov/nchs/data/databriefs/db131.pdf</a>
<b>Reference</b>	Moyer, V. A. (2012). Screening for and management of obesity in adults: U.S. Preventive Services Task Force

	Recommendation Statement. <i>Annals of Internal Medicine</i> , 157(5), 373-378. doi: 10.7326/0003-4819-157-5-201209040-00475
<b>Reference</b>	NHLBI Obesity Education Initiative. (1998). Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults.
<b>Reference</b>	Wilkinson, J., Bass, C., Diem, S., Gravley, A., Harvey, L., Hayes, R., Johnson, K., Maciosek, M., McKeon, K., Milteer, L., Morgan, J., Rothe, P., Snellman, L., Solberg, L., Storlie, C., & Vincent, P. (2013). Institute for Clinical Systems Improvement. Preventive Services for Adults. Retrieved from <a href="https://www.icsi.org/_asset/gtjr9h/PrevServAdults-Interactive0912.pdf">https://www.icsi.org/_asset/gtjr9h/PrevServAdults-Interactive0912.pdf</a> .
<b>Reference</b>	LeBlanc, E., O'Connor, E., Whitlock, E.P., Patnode, C., & Kapka T. (2011). Screening for and Management of Obesity and Overweight in Adults. (AHRQ Publication No. 11-05159- EF-1). Evidence Synthesis Number 89. Retrieved from <a href="http://www.uspreventiveservicestaskforce.org/uspstf11/obeseadult/obesees.pdf">http://www.uspreventiveservicestaskforce.org/uspstf11/obeseadult/obesees.pdf</a>
<b>Reference</b>	Barnes PM, & Schoenborn CA (2012). Trends in adults receiving a recommendation for exercise or other physical activity from a physician or other health professional. Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS) Data Brief, No. 86: Feb 2012.
<b>Reference</b>	Padula, W. V., Allen, R. R. & Nair, K. V. (2014). Determining the cost of obesity and its common comorbidities from a commercial claims database. <i>Clinical Obesity</i> 4, 53-58. doi: 10.1111/cob.12041
<b>Reference</b>	Borrell, L.N. & Samuel, L. (2014). Body mass index categories and mortality risk in US adults: The effect of overweight and obesity on advancing death. <i>American Journal of Public Health</i> , 104, 512-519.
<b>Reference</b>	Jensen, M.D., Ryan, D.H., Apovian, C.M., Ard, J.D., Comuzzie, A. G., Donato, K.A., ... Yanovski, S.Z. (2013). Practice guidelines and the obesity society report of the american college of cardiology/american heart association task force on 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: A report of the american college of cardiology/american heart association task force on practice guidelines and the obesity society. <i>Circulation</i> . doi: 10.1161/01.cir.0000437739.71477.
<b>Definition</b>	<p>BMI- Body mass index (BMI) is a number calculated using the Quetelet index: weight divided by height squared (W/H<sup>2</sup>) and is commonly used to classify weight categories. BMI can be calculated using:</p> <p>Metric Units: BMI = Weight (kg) / (Height (m) x Height (m)) OR English Units: BMI = Weight (lbs.) / (Height (in) x Height (in)) x 703</p> <p>Follow-Up Plan - Proposed outline of treatment to be conducted as a result of a BMI out of normal parameters. A follow-up plan may include, but is not limited to: documentation of education, referral (for example a registered dietician, nutritionist, occupational therapist, physical therapist, primary care provider, exercise physiologist, mental health professional, or surgeon), pharmacological interventions, dietary supplements, exercise counseling or nutrition counseling.</p>
<b>Guidance</b>	<ul style="list-style-type: none"> <li>* There is no diagnosis associated with this measure.</li> <li>* This measure is to be reported a minimum of once per reporting period for patients seen during the reporting period.</li> <li>* This measure may be reported by eligible professionals who perform the quality actions described in the measure based on the services provided at the time of the qualifying visit and the measure-specific denominator coding.</li> </ul> <p>BMI Measurement Guidance:</p> <ul style="list-style-type: none"> <li>* Height and Weight - An eligible professional or their staff is required to measure both height and weight. Both height and weight must be measured within six months of the current encounter and may be obtained from separate encounters. Self-reported values cannot be used.</li> <li>* The BMI may be documented in the medical record of the provider or in outside medical records obtained by the provider.</li> <li>* If the most recent documented BMI is outside of normal parameters, then a follow-up plan is documented during the encounter or during the previous six months of the current encounter.</li> <li>* If more than one BMI is reported during the measurement period, the most recent BMI will be used to determine if the performance has been met.</li> <li>* Review the exclusions criteria to determine those patients that BMI measurement may not be appropriate or necessary.</li> </ul> <p>Follow-Up Plan Guidance:</p> <ol style="list-style-type: none"> <li>1. * The documented follow-up plan must be based on the most recent documented BMI, outside of normal parameters, example: "Patient referred to nutrition counseling for BMI above or below normal parameters."</li> </ol> <p>(See Definitions for examples of follow-up plan treatments).</p> <p>Variation has been noted in studies exploring optimal BMI ranges for the elderly (see Donini et al., (2012); Holme and Tonstad (2015); and Diehr et al. (2008). Notably however, all these studies have arrived at ranges that differ from the standard range for ages 18 and older, which is <math>\geq 18.5</math> and <math>&lt; 25</math> kg/m<sup>2</sup>. For instance, both Donini et al. (2012) and Holme and Tonstad (2015) reported findings that suggest that higher BMI (higher than the upper end of 25kg/m<sup>2</sup>) in the elderly may be beneficial. Similarly, worse outcomes have been associated with being underweight (at a threshold higher than 18.5 kg/m<sup>2</sup>) at age 65 (Diehr et al. 2008). Because of optimal BMI range variation recommendations from these studies, no specific optimal BMI range for the elderly is used. However, It may be appropriate to exempt certain patients from a follow-up plan by applying the exception criteria. Review the following to apply the Medical Reason exception criteria: The Medical Reason exception could include, but is not limited to, the following patients as deemed appropriate by the health care provider:</p>

	<ul style="list-style-type: none"> <li>* Elderly Patients (65 or older) for whom weight reduction/weight gain would complicate other underlying health conditions such as the following examples: <ul style="list-style-type: none"> <li>*Illness or physical disability</li> <li>*Mental illness, dementia, confusion</li> </ul> </li> <li>*Nutritional deficiency such as Vitamin/mineral deficiency*</li>   <li>* Patients in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status</li> </ul>
<b>Transmission Format</b>	TBD
<b>Initial Population</b>	All patients 18 and older on the date of the encounter with at least one eligible encounter during the measurement period
<b>Denominator</b>	Equals Initial Population
<b>Denominator Exclusions</b>	Patients who are pregnant Patients receiving palliative care Patients who refuse measurement of height and/or weight or refuse follow-up
<b>Numerator</b>	Patients with a documented BMI during the encounter or during the previous six months, AND when the BMI is outside of normal parameters, a follow-up plan is documented during the encounter or during the previous six months of the current encounter
<b>Numerator Exclusions</b>	Not Applicable
<b>Denominator Exceptions</b>	Patients with a documented Medical Reason: <ul style="list-style-type: none"> <li>* Elderly Patients (65 or older) for whom weight reduction/weight gain would complicate other underlying health conditions such as the following examples: <ul style="list-style-type: none"> <li>*Illness or physical disability</li> <li>*Mental illness, dementia, confusion</li> <li>*Nutritional deficiency, such as Vitamin/mineral deficiency</li> </ul> </li> <li>* Patients in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status</li> </ul>
<b>Supplemental Data Elements</b>	For every patient evaluated by this measure also identify payer, race, ethnicity and sex

## Table of Contents

- [Population Criteria](#)
- [Data Criteria \(ODM Variables\)](#)
- [Data Criteria \(ODM Data Elements\)](#)
- [Supplemental Data Elements](#)
- [Risk Adjustment Variables](#)

## Population Criteria

- **Initial Population =**
  - AND: Age >= 18 year(s) at: "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
  - AND: "Occurrence A of Encounter, Performed: BMI Encounter Code Set" during "Measurement Period"
- **Denominator =**
  - AND: Initial Population
- **Denominator Exclusions =**
  - OR: Union of:
    - "Intervention, Order: Palliative Care" starts before end of "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
    - "Physical Exam, Performed not done: Patient Reason refused" for "BMI LOINC Value" during "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
    - "Diagnosis: Pregnancy Dx" overlaps "Measurement Period"
- **Numerator =**
  - AND:
    - OR: "Physical Exam, Performed: BMI LOINC Value" satisfies all:
      - Most Recent: (result) <= 6 month(s) starts before end of "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
      - (result >= 18.5 kg/m<sup>2</sup>)
      - (result < 25 kg/m<sup>2</sup>)
    - OR:
      - AND: Union of:
        - "Intervention, Order: Above Normal Follow-up (reason: Overweight)"
        - "Intervention, Order: Referrals where weight assessment may occur (reason: Overweight)"
        - "Medication, Order: Above Normal Medications (reason: Overweight)"

- ≤ 6 month(s) starts before end of "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
  - AND: "Physical Exam, Performed: BMI LOINC Value" satisfies all:
    - Most Recent: (result) ≤ 6 month(s) starts before end of "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
    - (result ≥ 25 kg/m<sup>2</sup>)
  - OR:
    - AND: Union of:
      - "Intervention, Order: Below Normal Follow up (reason: Underweight)"
      - "Intervention, Order: Referrals where weight assessment may occur (reason: Underweight)"
      - "Medication, Order: Below Normal Medications (reason: Underweight)"
      - ≤ 6 month(s) starts before end of "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
    - AND: "Physical Exam, Performed: BMI LOINC Value" satisfies all:
      - Most Recent: (result) ≤ 6 month(s) starts before end of "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
      - (result < 18.5 kg/m<sup>2</sup>)
- **Numerator Exclusions =**
  - None
- **Denominator Exceptions =**
  - OR: Union of:
    - "Intervention, Order not done: Medical or Other reason not done" for "Above Normal Follow-up"
    - "Intervention, Order not done: Medical or Other reason not done" for "Referrals where weight assessment may occur"
    - "Medication, Order not done: Medical or Other reason not done" for "Above Normal Medications"
    - "Intervention, Order not done: Medical or Other reason not done" for "Below Normal Follow up"
    - "Medication, Order not done: Medical or Other reason not done" for "Below Normal Medications"
    - ≤ 6 month(s) starts before end of "Occurrence A of Encounter, Performed: BMI Encounter Code Set"
- **Stratification =**
  - None

### Data Criteria (QDM Variables)

- None

### Data Criteria (QDM Data Elements)

- "Diagnosis: Pregnancy Dx" using "Pregnancy Dx Grouping Value Set (2.16.840.1.113883.3.600.1.1623)"
- "Encounter, Performed: BMI Encounter Code Set" using "BMI Encounter Code Set Grouping Value Set (2.16.840.1.113883.3.600.1.1751)"
- "Intervention, Order: Above Normal Follow-up" using "Above Normal Follow-up Grouping Value Set (2.16.840.1.113883.3.600.1.1525)"
- "Intervention, Order: Below Normal Follow up" using "Below Normal Follow up Grouping Value Set (2.16.840.1.113883.3.600.1.1528)"
- "Intervention, Order: Palliative Care" using "Palliative Care Grouping Value Set (2.16.840.1.113883.3.600.1.1579)"
- "Intervention, Order: Referrals where weight assessment may occur" using "Referrals where weight assessment may occur Grouping Value Set (2.16.840.1.113883.3.600.1.1527)"
- "Intervention, Order not done: Medical or Other reason not done" using "Medical or Other reason not done SNOMEDCT Value Set (2.16.840.1.113883.3.600.1.1502)"
- "Medication, Order: Above Normal Medications" using "Above Normal Medications RXNORM Value Set (2.16.840.1.113883.3.600.1.1498)"
- "Medication, Order: Below Normal Medications" using "Below Normal Medications RXNORM Value Set (2.16.840.1.113883.3.600.1.1499)"
- "Medication, Order not done: Medical or Other reason not done" using "Medical or Other reason not done SNOMEDCT Value Set (2.16.840.1.113883.3.600.1.1502)"
- "Physical Exam, Performed: BMI LOINC Value" using "BMI LOINC Value LOINC Value Set (2.16.840.1.113883.3.600.1.681)"
- "Physical Exam, Performed not done: Patient Reason refused" using "Patient Reason refused SNOMEDCT Value Set (2.16.840.1.113883.3.600.791)"
- Attribute: "Reason: Overweight" using "Overweight SNOMEDCT Value Set (2.16.840.1.113883.3.600.2387)"
- Attribute: "Reason: Underweight" using "Underweight SNOMEDCT Value Set (2.16.840.1.113883.3.600.2388)"

### Supplemental Data Elements

- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity CDCREC Value Set (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Payer: Payer" using "Payer SOP Value Set (2.16.840.1.114222.4.11.3591)"

- "Patient Characteristic Race: Race" using "Race CDCREC Value Set (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex AdministrativeGender Value Set (2.16.840.1.113762.1.4.1)"

### **Risk Adjustment Variables**

- None

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<b>Measure Set</b>	None
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