eCQM Title	**Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow-Up Plan**		
eCQM Identifier (Measure Authoring Tool)	69	**eCQM Version Number**	13.0.000
CBE Number	Not Applicable	**GUID**	9a031bb8-3d9b-11e1-8634-00237d5bf174
Measurement Period	January 1, 20XX through December 31, 20XX		
Measure Steward	Centers for Medicare & Medicaid Services (CMS)		
Measure Developer	Mathematica		
Endorsed By	None		
Description	Percentage of patients aged 18 years and older with a BMI documented during the current encounter or during the measurement period AND who had a follow-up plan documented if BMI was outside of normal parameters		
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Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale	BMI Above Normal Parameters “Obesity is a chronic, multifactorial disease with complex psychological, environmental (social and cultural), genetic, physiologic, metabolic and behavioral causes and consequences. The prevalence of overweight and obese people is increasing worldwide at an alarming rate in both developing and developed countries. Environmental and behavioral changes brought about by economic development, modernization and urbanization have been linked to the rise in global obesity. The health consequences are becoming apparent” (Fitch et al., 2013). More than a third of U.S. adults have a body mass index (BMI) >= 30 kg/m2 and are at increased risk for diabetes, cardiovascular disease (CVD), and obstructive sleep apnea (Flegal et al., 2012; Ogden et al., 2015; Dong et al., 2020). Hales et al. (2017), reported that the prevalence of obesity among adults and youth in the United States was 39.8 percent and 18.5 percent respectively, from 2015-2016. Furthermore, the prevalence of obesity in adults increased to 42.4 percent in 2018, with the highest percentage among adults in the 40-59 age bracket compared with other age groups (Hales et al., 2020). Hales et al. (2020) also disaggregated the data according to race/ethnicity and noted that obesity prevalence was higher among non-Hispanic Black adults and Hispanic adults when compared with other races and ethnicities. Obesity prevalence was lowest among non-Hispanic Asian men and women. Among men, obesity prevalence was higher among Hispanic men compared with non-Hispanic Black men and non-Hispanic White men. Among women, the prevalence among non-Hispanic Black women was 56.9 percent, which was higher than all		

	other race/ethnicities. In general, the prevalence of obesity in the U.S. remains higher than the Healthy People 2020 goals of 30.5 percent among adults (Hales et al., 2020). BMI continues to be a common and reasonably reliable measurement to identify overweight and obese adults who may be at an increased risk for future morbidity. Although good quality evidence supports obtaining a BMI, it is important to recognize it is not a perfect measurement. For example, BMI and its associated disease and mortality risk appear to vary among ethnic subgroups. Black/African Americans appear to have the lowest mortality risk at a BMI of 26.2-28.5 kg/m2 in Black women and 27.1-30.2 kg/m2 in Black men. In contrast, Asian populations may experience lowest mortality rates starting at a BMI of 23 to 24 kg/m2. The correlation between BMI and diabetes risk also varies by ethnicity (LeBlanc et al., 2011). BMI is not a direct measure of adiposity and as a consequence, it can over or underestimate adiposity. However, overall, BMI is a derived value that correlates well with total body fat and markers of secondary complications, e.g., hypertension and dyslipidemia (Barlow & the Expert Committee, 2007). It is important to enhance beneficiary access to appropriate treatments for obesity, which could result in decreased healthcare costs and lower obesity rates. Behavioral weight management treatment has been identified as an effective first-line treatment for obesity with an average initial weight loss of 8-10 percent. This percentage of weight loss is associated with a significant risk reduction for diabetes and CVD (Wadden, Butryn & Wilson, 2007). Evidence also shows that when provided 14 or more high-intensity behavioral intervention sessions of face-to-face individual or group treatment across 6 months, participants lose up to 8 percent of their weight during that time and experience improvements in heart disease risk factors and quality of life (Wadden, Tronieri, & Butryn, 2020). There is also evidence that high-intensity behavioral counseling is effective, whether delivered in-person, by phone, or electronically (Tronieri et al., 2019). Moreover, intensive behavioral therapy for obesity provided by registered dietitian nutritionists for 6-12 months shows significant mean weight loss of up to 10 percent of body weight, maintained over one year's time (Raynor & Champagne, 2016). Despite the evidence that supports weight management counseling, the rate of use in primary care for patients with obesity decreased by 10 percent from 39.9 percent in 1995-1996 to 29.9 percent in 2007-2008 (Kraschnewski et al., 2013). Weight management counseling during primary care visits further declined from 33 percent to 21 percent between 2008-2009 and 2012-2013. This suggests that obesity management in primary care remains suboptimal (Fitzpatrick & Stevens, 2017). Therefore, screening for BMI and follow-up is critical and will help in reaching the 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 their best clinical judgment when considering weight management programs for overweight patients, especially the elderly (National Heart, Lung, and Blood Institute [NHLBI] Obesity Education Initiative, 1998). BMI Below Normal Parameters On the other end of the body weight spectrum is underweight (BMI < 18.5 kg/m2), which is also detrimental to population health. When compared to normal weight individuals (BMI 18.5-25 kg/m2), underweight individuals have significantly higher death rates with a Hazard Ratio of 2.27 and 95 percent confidence intervals = 1.78, 2.90 (Borrell & Samuel, 2014). Individuals with a BMI < 18.5 kg/m2 have been shown to be at a higher risk for adverse events, postoperative infection, and/or mortality following a surgical procedure (Katakam, et al., 2021; Ottesen et al., 2020; Ottesen et al., 2022; Rudasill et al., 2021). BMI below normal parameters is a risk factor for developing severe illness from respiratory infections such as influenza and COVID-19 (Moser et al., 2019; Ye et al., 2021). BMI below normal parameters can negatively impact both male and female fertility (Boutari et al., 2020; Guo et al., 2019). Poor nutrition or underlying health conditions can result in underweight (Fryar & Ogden, 2012). The National Health and Nutrition Examination Survey (NHANES) results from 2007-2010 indicate that women are more likely to be underweight than men (Fryar & Ogden, 2012). However, all patients should be equally screened for underweight and followed up with nutritional counseling or another clinically appropriate intervention to reduce mortality and morbidity associated with underweight.
Clinical Recommendation Statement	All adults should be screened annually using a BMI measurement. BMI measurements >= 25 kg/m2 should be used to initiate further evaluation of overweight or obesity after taking into account age, gender, ethnicity, fluid status, and muscularity; therefore, clinical evaluation and judgment must be used when BMI is employed as the anthropometric indicator of excess adiposity, particularly in athletes and those with sarcopenia (Garvey et al., 2016) (Grade A). Overweight and Underweight Categories: Underweight < 18.5; Normal weight 18.5-24.9; Overweight 25-29.9; Obese class I 30-34.9; Obese class II 35-39.9; Obese class III >= 40 (Garvey et al., 2016).

	BMI cutoff point value of >= 23 kg/m2 should be used in the screening and confirmation of excess adiposity in Asian adults (Garvey et al., 2016) (Grade B). Lifestyle/behavioral therapy for overweight and obesity should include behavioral interventions that enhance adherence to prescriptions for a reduced-calorie meal plan and increased physical activity (behavioral interventions can include: self-monitoring of weight, food intake, and physical activity; clear and reasonable goal-setting; education pertaining to obesity, nutrition, and physical activity; face-to-face and group meetings; stimulus control; systematic approaches for problem solving; stress reduction; cognitive restructuring [i.e., cognitive behavioral therapy], motivational interviewing; behavioral contracting; psychological counseling; and mobilization of social support structures) (Garvey et al., 2016) (Grade A). Behavioral lifestyle intervention should be tailored to a patient's ethnic, cultural, socioeconomic, and educational background (Garvey et al., 2016) (Grade B). The U.S. Preventive Services Task Force (USPSTF) recommends that clinicians offer or refer adults with a BMI of 30 kg/m2 or higher to intensive, multicomponent behavioral interventions (USPSTF, 2018) (Grade B). Interventions: - Effective intensive behavioral interventions were designed to help participants achieve or maintain weight loss of at least five percent through a combination of dietary changes and increased physical activity - Most interventions lasted for one to two years, and the majority had at least 12 sessions in the first year - Most behavioral interventions focused on problem solving to identify barriers, self-monitoring of weight, peer support, and relapse prevention - Interventions also provided tools to support weight loss or weight loss maintenance (e.g., pedometers, food scales, or exercise videos) (USPSTF, 2018) 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" (NHLBI Obesity Education Initiative, 1998) (Evidence Category D). 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). 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 (NHLBI Obesity Education Initiative, 1998) (Evidence Category B).
Improvement Notation	Higher score indicates better quality
Reference	Reference Type: CITATION Reference Text: 'Barlow, S. E., & the Expert Committee. (2007). Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. Pediatrics, 120(Suppl. 4), S164-S192. doi:10.1542/peds.2007-2329C'
Reference	Reference Type: CITATION Reference Text: 'Borrell, L. N., & Samuel, L. (2014). Body mass index categories and mortality risk in U.S. adults: The effect of overweight and obesity on advancing death. American Journal of Public Health, 104(3), 512-519. doi:10.2105/AJPH.2013.301597'
Reference	Reference Type: CITATION Reference Text: 'Boutari, C., Pappas, P. D., Mintziori, G., Nigdelis, M. P., Athanasiadis, L., Goulis, D. G., & Mantzoros, C. S. (2020). The effect of underweight on female and male reproduction. Metabolism, 107, 154229. https://doi.org/10.1016/j.metabol.2020.154229'
Reference	Reference Type: CITATION Reference Text: 'Diehr, P., O'Meara, E. S., Fitzpatrick A., Newman, A. B., Kuller, L., & Burke, G. (2008). Weight, mortality, years of healthy life, and active life expectancy in older adults. Journal of the American Geriatrics Society,

	56(1), 76-83. https://doi.org/10.1111/j.1532-5415.2007.01500.x'
Reference	Reference Type: CITATION Reference Text: 'Dong, Z., Xu, X., Wang, C., Cartledge, S., Maddison, R., & Mohammed Shariful Islam, S. (2020). Association of overweight and obesity with obstructive sleep apnoea: A systematic review and meta-analysis. Obesity Medicine,17. doi:https://doi.org/10.1016/j.obmed.2020.100185'
Reference	Reference Type: CITATION Reference Text: 'Donini, L. M., Savina, C., Gennaro, E., De Felice, M. R., Rosano, A., Pandolfo, M. M., Del Balzo, V., Cannella, C., Ritz, P., & Chumlea, W. C. (2012). A systematic review of the literature concerning the relationship between obesity and mortality in the elderly. The Journal of Nutrition, Health & Aging, 16(1), 89-98. doi:10.1007/s12603-011-0073-x'
Reference	Reference Type: CITATION Reference Text: 'Fitch, A., Everling, L., Fox, C., Goldberg, J., Heim, C., Johnson, K., Kaufman, T., Kennedy, E., Kestenbaun, C., Lano, M., Leslie, D., Newell, T., O'Connor, P., Slusarek, B., Spaniol, A., Stovitz, S., & Webb, B. (2013). Prevention and management of obesity for adults. Bloomington, MN: Institute for Clinical Systems Improvement.'
Reference	Reference Type: CITATION Reference Text: 'Fitzpatrick, S. L., & Stevens, V. J. (2017). Adult obesity management in primary care, 2008-2013. Preventive medicine, 99, 128–133. https://doi.org/10.1016/j.ypmed.2017.02.020'
Reference	Reference Type: CITATION Reference Text: 'Flegal, K. M., Carroll, M. D., Kit, B. K., & Ogden, C. L. (2012). Prevalence of obesity and trends in the distribution of body mass index among U. S. adults, 1999-2010. JAMA, 307(5), 491-497. doi.10.1001/jama.2012.39'
Reference	Reference Type: CITATION Reference Text: 'Fryar, C. D., & Ogden, C. L. (2012). Prevalence of underweight among adults aged 20 and over: United States, 1960-1962 through 2007-2010. Hyattsville, MD: NCHS, Division of Health and Nutrition Examination Surveys. http://www.cdc.gov/nchs/data/hestat/underweight_adult_07_10/underweight_adult_07_10.pdf'
Reference	Reference Type: CITATION Reference Text: 'Garvey, W. T., Mechanick, J. I., Brett, E. M., Garber, A. J., Hurley, D. L., Jastrebodd. A. M., Nadolsky, K., Pessah-Pollack, R., Plodkowski, R., & Reviewers of the AACE/ACE Obesity Clinical Practice Guidelines. (2016). American Association of Clinical Endocrinologists and American College of Endocrinology Comprehensive clinical practice guidelines for medical care of patients with obesity. Endocrine Practice, 22(Suppl. 3), 1-203. https://doi.org/10.4158/EP161365.GL'
Reference	Reference Type: CITATION Reference Text: 'Guo, D., Xu, M., Zhou, Q., Wu, C., Ju, R., & Dai, J. (2019). Is low body mass index a risk factor for semen quality? A PRISMA-compliant meta-analysis. Medicine, 98(32), e16677. https://doi.org/10.1097/MD.0000000000016677'
Reference	Reference Type: CITATION Reference Text: 'Hales, C. M., Carroll, M. D., Fryar, C. D., et al. (2017). Prevalence of obesity among adults and youth: United States, 2015-2016. NCHS Data Brief No. 288. https://www.cdc.gov/nchs/products/databriefs/db288.htm'
Reference	Reference Type: CITATION Reference Text: 'Hales, C. M., Carroll, M. D., Fryar, C. D., & Ogden, C.L. (2020). Prevalence of Obesity and Severe Obesity Among Adults: United States, 2017-2018. NCHS Data Brief No. 360. https://www.cdc.gov/nchs/products/databriefs/db360.htm'
Reference	Reference Type: CITATION

	Reference Text: 'Holme, I., & Tonstad, S. (2015). Survival in elderly men in relation to midlife and current BMI. Age and Ageing, 44(3), 434-439'
Reference	Reference Type: CITATION Reference Text: 'Katakam, A., Melnic, C. M., Bragdon, C. R., Sauder, N., Collins, A. K., & Bedair, H. S. (2021). Low body mass index is a predictor for mortality and increased length of stay following total joint arthroplasty. The Journal of Arthroplasty, 36(1), 72-77. https://doi.org/10.1016/j.arth.2020.07.055'
Reference	Reference Type: CITATION Reference Text: 'Kraschnewski, J. L., Sciamanna, C. N., Stuckey, H. L., Chuang, C. H., Lehman, E. B., Hwang, K. O., Sherwood, L. L., & Nembhard, H. B. (2013). A silent response to the obesity epidemic: Decline in US physician weight counseling. Medical care, 51(2), 186–192. https://doi.org/10.1097/MLR.0b013e3182726c33'
Reference	Reference Type: CITATION Reference Text: 'LeBlanc, E., O'Connor, E., Whitlock, E. P., Patnode, C., & Kapka, T. (2011). Screening for and management of obesity and overweight in adults (Evidence Report No. 89; AHRQ Publication No. 11-05159-EF-1). Rockville, MD: Agency for Healthcare Research and Quality'
Reference	Reference Type: CITATION Reference Text: 'Moser, J. S., Galindo-Fraga, A., Ortiz-Hernández, A. A., Gu, W., Hunsberger, S., Galán-Herrera, J. F., Guerrero, M. L., Ruiz-Palacios, G. M., Beigel, J. H., & La Red ILI 002 Study Group. (2019). Underweight, overweight, and obesity as independent risk factors for hospitalization in adults and children from influenza and other respiratory viruses. Influenza and Other Respiratory Viruses, 13(1), 3-9. https://doi.org/10.1111/irv.12618'
Reference	Reference Type: CITATION Reference Text: 'NHLBI Obesity Education Initiative. (1998). Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults (Report No. 98-4083). Bethesda, MD: NHLBI'
Reference	Reference Type: CITATION Reference Text: 'Ogden, C.L., Carroll, M.D., Fryar, C.D., & Flegal, K.M. (2015). Prevalence of obesity among adults and youth: United States, 2011–2014. NCHS data brief, no 219. Hyattsville, MD: National Center for Health Statistics. https://www.cdc.gov/nchs/data/databriefs/db219.pdf'
Reference	Reference Type: CITATION Reference Text: 'Ottesen, T. D., Malpani, R., Galivanche, A. R., Zogg, C. K., Varthi, A. G., & Grauer, J. N. (2020). Underweight patients are at just as much risk as super morbidly obese patients when undergoing anterior cervical spine surgery. The Spine Journal: Official Journal of the North American Spine Society, 20(7), 1085-1095. https://doi.org/10.1016/j.spinee.2020.03.007'
Reference	Reference Type: CITATION Reference Text: 'Ottesen, T. D., Galivanche, A. R., Greene, J. D., Malpani, R., Varthi, A. G., & Grauer, J. N. (2022). Underweight patients are the highest risk body mass index group for perioperative adverse events following stand-alone anterior lumbar interbody fusion. The Spine Journal: Official Journal of the North American Spine Society, 22(7), 1139-1148. https://doi.org/10.1016/j.spinee.2022.02.012'
Reference	Reference Type: CITATION Reference Text: 'Raynor, H. A., & Champagne, C. M. (2016). Position of the Academy of Nutrition and Dietetics: Interventions for the treatment of overweight and obesity in adults. Journal of the Academy of Nutrition and Dietetics, 116(1), 129-147. doi:10.1016/jand.2015.10.031'

Reference	Reference Type: CITATION Reference Text: 'Rudasill, S. E., Dillon, D., Karunungan, K., Mardock, A. L., Hadaya, J., Sanaiha, Y., Tran, Z., & Benharash, P. (2021). The obesity paradox: Underweight patients are at the greatest risk of mortality after cholecystectomy. Surgery, 170(3), 675-681. https://doi.org/10.1016/j.surg.2021.03.034'
Reference	Reference Type: CITATION Reference Text: 'Tronieri, J. S., Wadden, T. A., Chao, A. M., & Tsai, A. G. (2019). Primary Care Interventions for Obesity: Review of the Evidence. Current obesity reports, 8(2), 128–136. https://doi.org/10.1007/s13679-019-00341-5'
Reference	Reference Type: CITATION Reference Text: 'U.S. Preventive Services Task Force (USPSTF). (2018). Behavioral weight loss interventions to prevent obesity-related morbidity and mortality in adults: U.S. Preventive Services Task Force recommendation statement. JAMA, 320(11), 1163–1171. doi:10.1001/jama.2018.13022'
Reference	Reference Type: CITATION Reference Text: 'Wadden, T. A, Butryn, M. L., & Wilson, C. (2007). Lifestyle modification for the management of obesity. Gastroenterology, 132 (6), 2226-2238. doi: 10.1053/j.gastro.2007.03.051'
Reference	Reference Type: CITATION Reference Text: 'Wadden, T. A., Tronieri, J. S., & Butryn, M. L. (2020). Lifestyle modification approaches for the treatment of obesity in adults. American Psychologist, 75(2), 235–251'
Reference	Reference Type: CITATION Reference Text: 'Ye, P., Pang, R., Li, L., Li, H. R., Liu, S. L., & Zhao, L. (2021). Both underweight and obesity are associated with an increased risk of coronavirus disease 2019 (COVID-19) severity. Frontiers in Nutrition, 8, 649422. https://doi.org/10.3389/fnut.2021.649422'
Definition	Normal BMI Parameters: Age 18 years and older BMI >= 18.5 and < 25 kg/m2. BMI - Body mass index (BMI) is a number calculated using the Quetelet index: weight divided by height squared (W/H2) and is commonly used to classify weight categories. BMI can be calculated using: Metric Units: BMI = Weight (kg) / (Height (m) x Height (m)) OR English Units: BMI = Weight (lbs) / (Height (in) x Height (in)) x 703 Follow-Up Plan - Proposed outline of treatment to be conducted as a result of a BMI outside of normal parameters. A follow-up plan may include, but is not limited to: documentation of education, referral (for example a registered dietitian nutritionist, occupational therapist, physical therapist, primary care provider, exercise physiologist, mental health professional, or surgeon) for lifestyle/behavioral therapy, pharmacological interventions, dietary supplements, exercise counseling and/or nutrition counseling.
Guidance	BMI Measurement Guidance: - Height and Weight - An eligible clinician or their staff is required to measure both height and weight. Both height and weight must be measured during the measurement period. Self-reported values cannot be used. - The BMI may be documented in the medical record of the provider or in outside medical records obtained by the provider. - If the documented BMI is outside of normal parameters, then a follow-up plan is documented during the encounter or during the measurement period. - If more than one BMI is reported during the measurement period, and any of the documented BMI assessments is outside of normal parameters, documentation of an appropriate follow-up plan will be used to determine if performance has been met. - Review the exclusions and exceptions criteria to determine those patients that BMI measurement may not be appropriate or necessary. Follow-Up Plan Guidance:

	The documented follow-up plan must be based on the documented BMI, outside of normal parameters, example: "Patient referred to nutrition counseling for BMI above or below normal parameters." See the Definition section for examples of follow-up plan treatments. Variation has been noted in studies exploring optimal BMI ranges for the elderly (see Donini et al., 2012; Holme & Tonstad, 2015; 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 >= 18.5 and < 25 kg/m2. For instance, both Donini et al. and Holme and Tonstad reported findings that suggest that higher BMI (higher than the upper end of 25 kg/m2) in the elderly may be beneficial. Similarly, worse outcomes have been associated with being underweight (at a threshold higher than 18.5 kg/m2) 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. See Denominator Exception section for examples. This eCQM is a patient-based measure. This measure is to be reported a minimum of once per measurement period for patients seen during the measurement period. This measure may be reported by eligible clinicians who perform the quality actions described in the measure based on the services provided at the time of the qualifying encounter or during the measurement period and the measure-specific denominator coding. Telehealth encounters are not eligible for this measure because the measure requires a clinical action that cannot be conducted via telehealth. If a patient meets exception criteria for the denominator (i.e., the patient refuses height or weight measurement or has a documented medical reason for not documenting BMI or a follow-up plan), an eligible clinician must document those criteria on the same day as the qualifying encounter. This version of the eCQM uses QDM version 5.6. Please refer to the eCQI resource center (https://ecqi.healthit.gov/qdm) for more information on the QDM.
Transmission Format	TBD
Initial Population	All patients aged 18 and older on the date of the encounter with at least one qualifying encounter during the measurement period
Denominator	Equals Initial Population
Denominator Exclusions	Patients who are pregnant at any time during the measurement period. Patients receiving palliative or hospice care at any time during the measurement period.
Numerator	Patients with a documented BMI during the encounter or during the measurement period, AND when the BMI is outside of normal parameters, a follow-up plan is documented during the encounter or during the measurement period
Numerator Exclusions	Not Applicable
Denominator Exceptions	Patients with a documented medical reason for not documenting BMI or for not documenting a follow-up plan for a BMI outside normal parameters (e.g., elderly patients 65 years of age or older for whom weight reduction/weight gain would complicate other underlying health conditions such as illness or physical disability, mental illness, dementia, confusion, or nutritional deficiency such as vitamin/mineral deficiency; 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). Patients who refuse measurement of height and/or weight.
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and sex

Table of Contents

Population Criteria

Initial Population

```
exists "Qualifying Encounter during Day of Measurement Period" QualifyingEncounter
  where "AgeInYearsAt"(date from start of QualifyingEncounter.relevantPeriod) >= 18
```

Denominator

```
"Initial Population"
```

Denominator Exclusions

```
Hospice."Has Hospice Services"
  or PalliativeCare."Has Palliative Care in the Measurement Period"
  or "Is Pregnant during Day of Measurement Period"
```

Numerator

```
exists "High BMI and Follow up Provided"
  or exists "Low BMI and Follow up Provided"
  or "Has Normal BMI"
```

Numerator Exclusions

None

Denominator Exceptions

```
exists "Medical Reason for Not Documenting a Follow up Plan for Low or High BMI"
  or exists "Medical Reason or Patient Reason for Not Performing BMI Exam"
```

Stratification

None

Definitions

BMI during Measurement Period

```
( ["Physical Exam, Performed": "Body mass index (BMI) [Ratio]"] BMI
    where Global."NormalizeInterval" ( BMI.relevantDatetime, BMI.relevantPeriod ) during day of "Measurement Period"
      and BMI.result > 0 'kg/m2'
)
```

Denominator

"Initial Population"

Denominator Exceptions

exists "Medical Reason for Not Documenting a Follow up Plan for Low or High BMI"
  or exists "Medical Reason or Patient Reason for Not Performing BMI Exam"

Denominator Exclusions

Hospice."Has Hospice Services"
  or PalliativeCare."Has Palliative Care in the Measurement Period"
  or "Is Pregnant during Day of Measurement Period"

Documented High BMI during Measurement Period

"BMI during Measurement Period" BMI
  where Global."NormalizeInterval" (BMI.relevantDatetime, BMI.relevantPeriod) during day of "Measurement Period"
    and BMI.result >= 25 'kg/m2'

Documented Low BMI during Measurement Period

"BMI during Measurement Period" BMI
  where Global."NormalizeInterval" (BMI.relevantDatetime, BMI.relevantPeriod) during day of "Measurement Period"
    and BMI.result < 18.5 'kg/m2'

Has Normal BMI

exists ("BMI during Measurement Period" BMI
    where BMI.result >= 18.5 'kg/m2'
      and BMI.result < 25 'kg/m2'
)
  and not (exists "Documented High BMI during Measurement Period"
      or exists "Documented Low BMI during Measurement Period"
)

High BMI and Follow up Provided

("Documented High BMI during Measurement Period" HighBMI
    with ("High BMI Interventions Ordered"
      union "High BMI Interventions Performed") HighBMIInterventions
      such that (Coalesce(start of Global."NormalizeInterval"(HighBMIInterventions.relevantDatetime, HighBMIInterventions.relevantPeriod),
HighBMIInterventions.authorDatetime) during day of "Measurement Period")
)

High BMI Interventions Ordered

((["Intervention, Order": "Follow Up for Above Normal BMI"]
    union ["Intervention, Order": "Referrals Where Weight Assessment May Occur"]
    union ["Medication, Order": "Medications for Above Normal BMI"]) HighInterventionsOrdered
    where HighInterventionsOrdered.reason in "Overweight or Obese"
      or (exists ["Diagnosis": "Overweight or Obese"] OverweightObese
          where OverweightObese.prevalencePeriod starts before or on day of HighInterventionsOrdered.authorDatetime
            and not (OverweightObese.prevalencePeriod ends before day of HighInterventionsOrdered.authorDatetime)
)
)

High BMI Interventions Performed

```
( ["Intervention, Performed": "Follow Up for Above Normal BMI"] HighInterventionsPerformed
    where HighInterventionsPerformed.reason in "Overweight or Obese"
      or ( exists ["Diagnosis": "Overweight or Obese"] OverweightObese
          where OverweightObese.prevalencePeriod starts before or on day of Global."NormalizeInterval" ( HighInterventionsPerformed.relevantDatetime,
HighInterventionsPerformed.relevantPeriod )
            and not ( OverweightObese.prevalencePeriod ends before day of Global."NormalizeInterval" ( HighInterventionsPerformed.relevantDatetime,
HighInterventionsPerformed.relevantPeriod ) )
      )
)
```

Hospice.Has Hospice Services

```
exists ( ["Encounter, Performed": "Encounter Inpatient"] InpatientEncounter
    where ( InpatientEncounter.dischargeDisposition ~ "Discharge to home for hospice care (procedure)"
       or InpatientEncounter.dischargeDisposition ~ "Discharge to healthcare facility for hospice care (procedure)"
    )
      and InpatientEncounter.relevantPeriod ends during day of "Measurement Period"
)
  or exists ( ["Encounter, Performed": "Hospice Encounter"] HospiceEncounter
      where HospiceEncounter.relevantPeriod overlaps day of "Measurement Period"
  )
  or exists ( ["Assessment, Performed": "Hospice care [Minimum Data Set]"] HospiceAssessment
      where HospiceAssessment.result ~ "Yes (qualifier value)"
        and Global."NormalizeInterval" ( HospiceAssessment.relevantDatetime, HospiceAssessment.relevantPeriod ) overlaps day of "Measurement Period"
  )
  or exists ( ["Intervention, Order": "Hospice Care Ambulatory"] HospiceOrder
      where HospiceOrder.authorDatetime during day of "Measurement Period"
  )
  or exists ( ["Intervention, Performed": "Hospice Care Ambulatory"] HospicePerformed
      where Global."NormalizeInterval" ( HospicePerformed.relevantDatetime, HospicePerformed.relevantPeriod ) overlaps day of "Measurement Period"
  )
or exists ( ["Diagnosis": "Hospice Diagnosis"] HospiceCareDiagnosis
      where HospiceCareDiagnosis.prevalencePeriod overlaps day of "Measurement Period"
  )
```

Initial Population

```
exists "Qualifying Encounter during Day of Measurement Period" QualifyingEncounter
  where "AgeInYearsAt"(date from start of QualifyingEncounter.relevantPeriod) >= 18
```

Is Pregnant during Day of Measurement Period

```
exists ( ["Diagnosis": "Pregnancy"] PregnancyDiagnosis
    with "Qualifying Encounter during Day of Measurement Period" QualifyingEncounter
      such that PregnancyDiagnosis.prevalencePeriod overlaps day of "Measurement Period"
)
```

Low BMI and Follow up Provided

```
( "Documented Low BMI during Measurement Period" LowBMI
    with ( "Low BMI Interventions Ordered"
      union "Low BMI Interventions Performed" ) LowBMIInterventions
      such that ( Coalesce(start of Global."NormalizeInterval"(LowBMIInterventions.relevantDatetime, LowBMIInterventions.relevantPeriod),
LowBMIInterventions.authorDatetime) during day of "Measurement Period" )
)
```

Low BMI Interventions Ordered

```
( ( ["Intervention, Order": "Follow Up for Below Normal BMI"]
    union ["Intervention, Order": "Referrals Where Weight Assessment May Occur"]
```

```
    union ["Medication, Order": "Medications for Below Normal BMI"] ) LowInterventionsOrdered
    where LowInterventionsOrdered.reason in "Underweight"
      or ( exists ["Diagnosis": "Underweight"] Underweight
          where Underweight.prevalencePeriod starts before or on day of LowInterventionsOrdered.authorDatetime
            and not ( Underweight.prevalencePeriod ends before day of LowInterventionsOrdered.authorDatetime )
      )
)
```

Low BMI Interventions Performed

```
( ["Intervention, Performed": "Follow Up for Below Normal BMI"] LowInterventionsPerformed
    where LowInterventionsPerformed.reason in "Underweight"
      or ( exists ["Diagnosis": "Underweight"] Underweight
          where Underweight.prevalencePeriod starts before or on day of Global."NormalizeInterval" ( LowInterventionsPerformed.relevantDatetime,
LowInterventionsPerformed.relevantPeriod )
            and not ( Underweight.prevalencePeriod ends before day of Global."NormalizeInterval" ( LowInterventionsPerformed.relevantDatetime,
LowInterventionsPerformed.relevantPeriod ) )
      )
)
```

Medical Reason for Not Documenting a Follow up Plan for Low or High BMI

```
( ["Intervention, Not Ordered": "Referrals Where Weight Assessment May Occur"]
  union ["Intervention, Not Ordered": "Follow Up for Above Normal BMI"]
  union ["Intervention, Not Performed": "Follow Up for Above Normal BMI"]
  union ["Intervention, Not Ordered": "Follow Up for Below Normal BMI"]
  union ["Intervention, Not Performed": "Follow Up for Below Normal BMI"]
  union ["Medication, Not Ordered": "Medications for Above Normal BMI"]
  union ["Medication, Not Ordered": "Medications for Below Normal BMI"] ) NoBMIFollowUp
  with "Qualifying Encounter during Day of Measurement Period" QualifyingEncounter
    such that NoBMIFollowUp.authorDatetime same day as start of QualifyingEncounter.relevantPeriod
  where NoBMIFollowUp.negationRationale in "Medical Reason"
```

Medical Reason or Patient Reason for Not Performing BMI Exam

```
["Physical Exam, Not Performed": "Body mass index (BMI) [Ratio]"] NoBMI
  with "Qualifying Encounter during Day of Measurement Period" QualifyingEncounter
    such that NoBMI.authorDatetime same day as start of QualifyingEncounter.relevantPeriod
  where ( NoBMI.negationRationale in "Medical Reason"
      or NoBMI.negationRationale in "Patient Declined"
  )
```

Numerator

```
exists "High BMI and Follow up Provided"
  or exists "Low BMI and Follow up Provided"
  or "Has Normal BMI"
```

PalliativeCare.Has Palliative Care in the Measurement Period

```
exists ( ["Assessment, Performed": "Functional Assessment of Chronic Illness Therapy - Palliative Care Questionnaire (FACIT-Pal)"] PalliativeAssessment
    where Global."NormalizeInterval" ( PalliativeAssessment.relevantDatetime, PalliativeAssessment.relevantPeriod ) overlaps day of "Measurement Period"
)
  or exists ( ["Diagnosis": "Palliative Care Diagnosis"] PalliativeDiagnosis
      where PalliativeDiagnosis.prevalencePeriod overlaps day of "Measurement Period"
  )
  or exists ( ["Encounter, Performed": "Palliative Care Encounter"] PalliativeEncounter
      where PalliativeEncounter.relevantPeriod overlaps day of "Measurement Period"
  )
  or exists ( ["Intervention, Performed": "Palliative Care Intervention"] PalliativeIntervention
```

```
    where Global."NormalizeInterval" ( PalliativeIntervention.relevantDatetime, PalliativeIntervention.relevantPeriod ) overlaps day of "Measurement Period"
)
```

Qualifying Encounter during Day of Measurement Period

```
["Encounter, Performed": "Encounter to Evaluate BMI"] BMIEncounter
  where BMIEncounter.relevantPeriod during day of "Measurement Period"
    and BMIEncounter.class !~ "virtual"
```

SDE Ethnicity

```
["Patient Characteristic Ethnicity": "Ethnicity"]
```

SDE Payer

```
["Patient Characteristic Payer": "Payer Type"]
```

SDE Race

```
["Patient Characteristic Race": "Race"]
```

SDE Sex

```
["Patient Characteristic Sex": "ONC Administrative Sex"]
```

Functions

Global.NormalizeInterval(pointInTime DateTime, period Interval<DateTime>)

```
if pointInTime is not null then Interval[pointInTime, pointInTime]
  else if period is not null then period
  else null as Interval<DateTime>
```

Terminology

- code "Body mass index (BMI) [Ratio]" ("LOINC Code (39156-5)")
- code "Discharge to healthcare facility for hospice care (procedure)" ("SNOMEDCT Code (428371000124100)")
- code "Discharge to home for hospice care (procedure)" ("SNOMEDCT Code (428361000124107)")
- code "Functional Assessment of Chronic Illness Therapy - Palliative Care Questionnaire (FACIT-Pal)" ("LOINC Code (71007-9)")
- code "Hospice care [Minimum Data Set]" ("LOINC Code (45755-6)")
- code "virtual" ("ActCode Code (VR)")
- code "Yes (qualifier value)" ("SNOMEDCT Code (373066001)")
- valueset "Encounter Inpatient" (2.16.840.1.113883.3.666.5.307)
- valueset "Encounter to Evaluate BMI" (2.16.840.1.113883.3.600.1.1751)
- valueset "Ethnicity" (2.16.840.1.114222.4.11.837)
- valueset "Follow Up for Above Normal BMI" (2.16.840.1.113883.3.600.1.1525)
- valueset "Follow Up for Below Normal BMI" (2.16.840.1.113883.3.600.1.1528)
- valueset "Hospice Care Ambulatory" (2.16.840.1.113883.3.526.3.1584)
- valueset "Hospice Diagnosis" (2.16.840.1.113883.3.464.1003.1165)
- valueset "Hospice Encounter" (2.16.840.1.113883.3.464.1003.1003)
- valueset "Medical Reason" (2.16.840.1.113883.3.526.3.1007)
- valueset "Medications for Above Normal BMI" (2.16.840.1.113883.3.526.3.1561)
- valueset "Medications for Below Normal BMI" (2.16.840.1.113883.3.526.3.1562)
- valueset "ONC Administrative Sex" (2.16.840.1.113762.1.4.1)
- valueset "Overweight or Obese" (2.16.840.1.113762.1.4.1047.502)
- valueset "Palliative Care Diagnosis" (2.16.840.1.113883.3.464.1003.1167)
- valueset "Palliative Care Encounter" (2.16.840.1.113883.3.464.1003.101.12.1090)

- valueset "Palliative Care Intervention" (2.16.840.1.113883.3.464.1003.198.12.1135)
- valueset "Patient Declined" (2.16.840.1.113883.3.526.3.1582)
- valueset "Payer Type" (2.16.840.1.114222.4.11.3591)
- valueset "Pregnancy" (2.16.840.1.113883.3.526.3.378)
- valueset "Race" (2.16.840.1.114222.4.11.836)
- valueset "Referrals Where Weight Assessment May Occur" (2.16.840.1.113883.3.600.1.1527)
- valueset "Underweight" (2.16.840.1.113883.3.526.3.1563)

Data Criteria (QDM Data Elements)

- "Assessment, Performed: Functional Assessment of Chronic Illness Therapy - Palliative Care Questionnaire (FACIT-Pal)" using "Functional Assessment of Chronic Illness Therapy - Palliative Care Questionnaire (FACIT-Pal) (LOINC Code 71007-9)"
- "Assessment, Performed: Hospice care [Minimum Data Set]" using "Hospice care [Minimum Data Set] (LOINC Code 45755-6)"
- "Diagnosis: Hospice Diagnosis" using "Hospice Diagnosis (2.16.840.1.113883.3.464.1003.1165)"
- "Diagnosis: Overweight or Obese" using "Overweight or Obese (2.16.840.1.113762.1.4.1047.502)"
- "Diagnosis: Palliative Care Diagnosis" using "Palliative Care Diagnosis (2.16.840.1.113883.3.464.1003.1167)"
- "Diagnosis: Pregnancy" using "Pregnancy (2.16.840.1.113883.3.526.3.378)"
- "Diagnosis: Underweight" using "Underweight (2.16.840.1.113883.3.526.3.1563)"
- "Encounter, Performed: Encounter Inpatient" using "Encounter Inpatient (2.16.840.1.113883.3.666.5.307)"
- "Encounter, Performed: Encounter to Evaluate BMI" using "Encounter to Evaluate BMI (2.16.840.1.113883.3.600.1.1751)"
- "Encounter, Performed: Hospice Encounter" using "Hospice Encounter (2.16.840.1.113883.3.464.1003.1003)"
- "Encounter, Performed: Palliative Care Encounter" using "Palliative Care Encounter (2.16.840.1.113883.3.464.1003.101.12.1090)"
- "Intervention, Not Ordered: Follow Up for Above Normal BMI" using "Follow Up for Above Normal BMI (2.16.840.1.113883.3.600.1.1525)"
- "Intervention, Not Ordered: Follow Up for Below Normal BMI" using "Follow Up for Below Normal BMI (2.16.840.1.113883.3.600.1.1528)"
- "Intervention, Not Ordered: Referrals Where Weight Assessment May Occur" using "Referrals Where Weight Assessment May Occur (2.16.840.1.113883.3.600.1.1527)"
- "Intervention, Not Performed: Follow Up for Above Normal BMI" using "Follow Up for Above Normal BMI (2.16.840.1.113883.3.600.1.1525)"
- "Intervention, Not Performed: Follow Up for Below Normal BMI" using "Follow Up for Below Normal BMI (2.16.840.1.113883.3.600.1.1528)"
- "Intervention, Order: Follow Up for Above Normal BMI" using "Follow Up for Above Normal BMI (2.16.840.1.113883.3.600.1.1525)"
- "Intervention, Order: Follow Up for Below Normal BMI" using "Follow Up for Below Normal BMI (2.16.840.1.113883.3.600.1.1528)"
- "Intervention, Order: Hospice Care Ambulatory" using "Hospice Care Ambulatory (2.16.840.1.113883.3.526.3.1584)"
- "Intervention, Order: Referrals Where Weight Assessment May Occur" using "Referrals Where Weight Assessment May Occur (2.16.840.1.113883.3.600.1.1527)"
- "Intervention, Performed: Follow Up for Above Normal BMI" using "Follow Up for Above Normal BMI (2.16.840.1.113883.3.600.1.1525)"
- "Intervention, Performed: Follow Up for Below Normal BMI" using "Follow Up for Below Normal BMI (2.16.840.1.113883.3.600.1.1528)"
- "Intervention, Performed: Hospice Care Ambulatory" using "Hospice Care Ambulatory (2.16.840.1.113883.3.526.3.1584)"
- "Intervention, Performed: Palliative Care Intervention" using "Palliative Care Intervention (2.16.840.1.113883.3.464.1003.198.12.1135)"
- "Medication, Not Ordered: Medications for Above Normal BMI" using "Medications for Above Normal BMI (2.16.840.1.113883.3.526.3.1561)"
- "Medication, Not Ordered: Medications for Below Normal BMI" using "Medications for Below Normal BMI (2.16.840.1.113883.3.526.3.1562)"
- "Medication, Order: Medications for Above Normal BMI" using "Medications for Above Normal BMI (2.16.840.1.113883.3.526.3.1561)"
- "Medication, Order: Medications for Below Normal BMI" using "Medications for Below Normal BMI (2.16.840.1.113883.3.526.3.1562)"
- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Payer: Payer Type" using "Payer Type (2.16.840.1.114222.4.11.3591)"
- "Patient Characteristic Race: Race" using "Race (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex (2.16.840.1.113762.1.4.1)"
- "Physical Exam, Not Performed: Body mass index (BMI) [Ratio]" using "Body mass index (BMI) [Ratio] (LOINC Code 39156-5)"
- "Physical Exam, Performed: Body mass index (BMI) [Ratio]" using "Body mass index (BMI) [Ratio] (LOINC Code 39156-5)"

Supplemental Data Elements

◢ SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

◢ SDE Payer

["Patient Characteristic Payer": "Payer Type"]

◢ SDE Race

["Patient Characteristic Race": "Race"]

SDE Sex

["Patient Characteristic Sex": "ONC Administrative Sex"]

Risk Adjustment Variables

None

Measure Set	None