List of Measures under Consideration for December 21, 2020

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OVERVIEW

Background

It has been an unprecedented year as the Centers for Medicare & Medicaid Services (CMS) and its healthcare partners across the country have led the way to protect the health and safety of this nation's patients and providers in response to the Novel Coronavirus (COVID-19) pandemic. This year in particular, it is especially crucial that CMS engages with stakeholders to strengthen CMS's quality measurement portfolio, solicit feedback early from the public as well as CMS's overall approach to quality measurement as COVID-19 becomes more prevalent across the country. The pre-rulemaking process provides CMS with a vehicle to hear from stakeholders for early consideration of measures, as well as allowing CMS the opportunity to review measures developed by the public.

CMS is issuing this List of Measures under Consideration (MUC) to comply with statutory requirements,[1] which require the Secretary of the Department of Health and Human Services (HHS) to make publicly available a list of certain quality and efficiency measures it is considering for adoption through rulemaking under Medicare. Among the measures, the list includes measures CMS is considering that were suggested by the public. When organizations, such as physician specialty societies, request that CMS consider measures, CMS evaluates the submission for inclusion on the MUC List so the Measure Applications Partnership (MAP), the statutorily required[2] multi-stakeholder groups, can provide their input on potential measures. Inclusion of a measure on

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[1] Section 1890A(a)(2) of the Social Security Act (42 U.S.C. § 1395aaa-1(a)(2)).
[2] Section 1890A(a) of the Social Security Act (42 U.S.C. § 1395aaa-1(a)).

this list does not require CMS to adopt the measure for the identified program. Therefore, this list is likely larger than what will ultimately be adopted by CMS for optional or mandatory reporting programs in Medicare.

CMS will continue its goal of aligning measures across programs. Measure alignment includes looking first to existing program measures for use in new programs. Further, CMS programs must balance competing goals of establishing parsimonious measure sets, while including sufficient measures to facilitate multi-specialty provider and supplier participation.

Statutory Requirement

HHS is statutorily required[3] to establish a federal pre-rulemaking process for the selection of certain quality and efficiency measures[4] for use by HHS. One of the steps in the pre-rulemaking process requires that HHS make publicly available, not later than December 1 annually, a list of quality and efficiency measures HHS is considering adopting, through the federal rulemaking process, for use in certain Medicare quality programs.

The pre-rulemaking process includes the following additional steps:

1. Providing the opportunity for multi-stakeholder groups to provide input not later than February 1 annually to HHS on the selection of quality and efficiency measures;

2. Considering the multi-stakeholder groups' input in selecting quality and efficiency measures;

3. Publishing in the Federal Register the rationale for the use of any quality and efficiency measures that are not endorsed by the entity with a contract under Section 1890 of the Act,

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[3] Section 1890A of the Social Security Act (42 U.S.C. § 1395aaa-1).
[4] As listed in Section 1890(b)(7)(B) of the Social Security Act (42 U.S.C. § 1395aaa).

which is currently the National Quality Forum (NQF)[5]; and

4. Assessing the quality and efficiency impact of the use of endorsed measures and making that assessment available to the public at least every three years. (The 2012, 2015, and 2018 editions of that report and related documents are available at the website of the CMS National Impact Assessment.)

Fulfilling HHS's Requirement to Make Its Measures under Consideration Publicly Available

The attached MUC List, which is compiled by CMS, will be posted on the NQF website and the CMS Pre-Rulemaking site. This posting will satisfy an important requirement of the pre-rulemaking process by making public the quality and efficiency measures that HHS is considering for use under certain Medicare quality programs. Additionally, the CMS website will indicate the MUC list is being posted on the NQF website.

Included Measures

This MUC List identifies the quality and efficiency measures under consideration by the Secretary of HHS for use in certain Medicare quality programs. Measures that appear on this list but are not selected for use under the Medicare program for the current rulemaking cycle will remain under consideration for future rulemaking cycles. They remain under consideration only for purposes of the particular program or other use for which CMS was considering them when they were placed on the MUC List. These measures can be selected for those previously considered purposes and programs/uses in future rulemaking cycles. This MUC List as well as prior year MUC

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[5] The rationale for adopting measures not endorsed by the consensus-based entity will be published in rulemaking where such measures are proposed and finalized.

Lists and Measure Applications Partnership (MAP) Reports can be found at:

https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityMeasures/Pre-RuleMaking.html.

Applicable Programs

The following programs that now use or will use quality and efficiency measures have been identified to take part in pre-rulemaking. Not all programs have measures on the current MUC list; those shown in **boldface** have one or more measures in 2020. Table 1 below shows the numbers of measures per program.

- **Ambulatory Surgical Center Quality Reporting Program (ASCQR)**
- **End-Stage Renal Disease Quality Incentive Program (ESRD QIP)**
- Home Health Quality Reporting Program (HH QRP)
- **Hospice Quality Reporting Program (HQRP)**
- Hospital-Acquired Condition Reduction Program (HACRP)
- **Hospital Inpatient Quality Reporting Program (Hospital IQR Program)**
- **Hospital Outpatient Quality Reporting Program (Hospital OQR Program)**
- Hospital Readmissions Reduction Program (HRRP)
- Hospital Value-Based Purchasing Program (HVBP)
- **Inpatient Psychiatric Facility Quality Reporting Program (IPFQR)**
- **Inpatient Rehabilitation Facility Quality Reporting Program (IRF QRP)**
- **Long-Term Care Hospital Quality Reporting Program (LTCH QRP)**
- **Medicare and Medicaid Promoting Interoperability Program for Eligible Hospitals (EHs) or Critical Access Hospitals (CAHs)**
- **Medicare Shared Savings Program**
- **Merit-based Incentive Payment System (MIPS)**
- Part C and D Star Rating [Medicare]

♦ **Prospective Payment System-Exempt Cancer Hospital Quality Reporting Program (PCHQR)**

♦ **Skilled Nursing Facility Quality Reporting Program (SNF QRP)**

♦ Skilled Nursing Facility Value-Based Purchasing Program (SNF VBP)

Table 1. Number of Measures under Consideration by Program[6]

CMS Program	Number of Measures under Consideration
Ambulatory Surgical Center Quality Reporting	1
End-Stage Renal Disease Quality Incentive Program	3
Home Health Quality Reporting Program	0
Hospice Quality Reporting Program	1
Hospital-Acquired Condition Reduction Program	0
Hospital Inpatient Quality Reporting Program	3
Hospital Outpatient Quality Reporting Program	3
Hospital Readmissions Reduction Program	0
Hospital Value-Based Purchasing Program	0
Inpatient Psychiatric Facility Quality Reporting Program	1
Inpatient Rehabilitation Facility Quality Reporting Program	1
Long-Term Care Hospital Quality Reporting Program	1
Medicare and Medicaid Promoting Interoperability Program for Eligible Hospitals (EHs) or Critical Access Hospitals (CAHs)	1
Medicare Shared Savings Program	1
Merit-based Incentive Payment System	10
Part C & D Star Rating [Medicare]	0
Prospective Payment System-Exempt Cancer Hospital Quality Reporting Program	1
Skilled Nursing Facility Quality Reporting Program	2
Skilled Nursing Facility Value-Based Purchasing Program	0

Measures List Highlights

By publishing this list, CMS will make publicly available and seek the multi-stakeholder

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[6] A single measure may be under consideration for more than one program.

groups' input on 20 measures under consideration for use in Medicare programs. CMS notes several important points to consider and highlight:

♦ CMS has included three measures intended to evaluate COVID-19 vaccination coverage and help protect healthcare personnel and patients. The vaccination measures align with 11 CMS programs.

♦ The following components of the Department of Health and Human Services contributed to and supported CMS in publishing a majority of measures on this list:

  o Office of the Assistant Secretary for Health

  o Office of the National Coordinator for Health Information Technology

  o National Institutes of Health

  o Agency for Healthcare Research and Quality

  o Health Resources and Services Administration

  o Centers for Disease Control and Prevention

  o Substance Abuse and Mental Health Services Administration

  o Office of the Assistant Secretary for Planning and Evaluation

  o Indian Health Service

  o Food and Drug Administration

♦ CMS will continue aligning measures across programs whenever possible with the goals of moving payment toward value, improving outcomes for patients, and reducing regulatory burden for clinicians and providers through focusing everyone's efforts on the same quality areas. In an effort to provide a more meaningful List of Measures under Consideration, CMS included only measures that contain adequate specifications. Measures contained on this

list had to fill a quality and efficiency measurement need and were assessed for alignment

across CMS programs when applicable. To achieve this goal of alignment across programs,

measures in the 2020 MUC list were reviewed using the Meaningful Measures Framework.

Meaningful Measures

The Meaningful Measures key themes and framework, launched in October 2017 as a response

to the increased regulatory and reporting burden on providers, continues to guide CMS. The

Meaningful Measures Initiative is aimed at identifying the highest priority areas for quality

measurement and quality improvement in order to assess the core quality of care issues that are most

vital to advancing the agency's work to improve patient outcomes. The Meaningful Measures Initiative

represents a new approach to quality measures that will work to:

- Provide rapid performance feedback to providers;

- Accelerate the move to fully digital measures;

- Unleash the voice of the patient through use of patient reported outcome measures;

- Use measures that will advance innovative payment structures;

- Increase alignment of measures;

- Promote use of all payer data (where feasible); and

- Focus on major domain outcomes.

While CMS is still receiving feedback in order to finalize a new framework, CMS has used the existing

Meaningful Measures framework to categorize measures and ensure that they align with the most

critical quality areas, which are mapped out in Table 2 by priority and area.

Table 2. Meaningful Measures Framework Domains and Measure Areas

Quality Priority	Meaningful Measure Area
Make Care Safer by Reducing Harm Caused in the Delivery of Care	Healthcare-Associated Infections
	Preventable Healthcare Harm
Strengthen Person and Family Engagement as Partners in Their Care	Care is Personalized and Aligned with Patient's Goals
	End of Life Care according to Preferences
	Patient's Experience of Care
	Functional Outcomes
Promote Effective Communication and Coordination of Care	Medication Management
	Admissions and Readmissions to Hospitals
	Transfer of Health Information and Interoperability
Promote Effective Prevention and Treatment of Chronic Disease	Preventive Care
	Management of Chronic Conditions
	Prevention, Treatment, and Management of Mental Health
	Prevention and Treatment of Opioid and Substance Use Disorders
	Risk Adjusted Mortality
Work with Communities to Promote Best Practices of Healthy Living	Equity of Care
	Community Engagement
Make Care Affordable	Appropriate Use of Healthcare
	Patient-focused Episode of Care
	Risk Adjusted Total Cost of Care

By including Meaningful Measures in its programs, CMS addresses the following cross-cutting measure criteria:

- Eliminating disparities

- Tracking measurable outcomes and impact

- Safeguarding public health

- Achieving cost savings

- Improving access for rural communities

- Reducing burden.

Through the Meaningful Measures Initiative, CMS can improve the quality of healthcare for all

Americans by continuing to modernize the quality reporting and payment programs, including

alignment across all programs.

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LIST OF MEASURES UNDER CONSIDERATION

Legend for List of Measures under Consideration

MUC ID: Gives users an identifier to refer to a unique measure. The "MUC20-" prefix is intended to aid future researchers in distinguishing among measures considered in different years.

Measure Title: The title of the measure.

Description: Gives users more detailed information about the measure, such as medical conditions to be measured, particular outcomes or results that could or should/should not result from the care and patient populations.

Measure Type: Refers to the domain of quality that a measure assesses:

♦ Composite: A combination of two or more component measures, each of which individually reflects quality of care, into a single quality measure with a single score.

♦ Cost/Resource Use: A count of the frequency of units of defined health system services or resources; some may further apply a dollar amount (e.g., allowable charges, paid amounts, or standardized prices) to each unit of resource use.

♦ Efficiency: Refers to a relationship between a specific level of quality of health care provided and the resources used to provide that care.

♦ Intermediate Outcome: Refers to a change produced by a health care intervention that leads to a longer-term outcome (e.g., a reduction in blood pressure is an intermediate outcome that leads to a reduction in the risk of longer-term outcomes such as cardiac infarction or stroke).

♦ Outcome: The health status of a patient (or change in health status) resulting from healthcare, which can be desirable or adverse.

♦ Patient Reported Outcome: Refers to a measure of a patient's feelings or what they are able to do as they are dealing with diseases or conditions. These types of measures may include Patient Reported Outcome Measures (PROMs) and Patient Reported Outcome-Based Performance Measures (PRO-PMs).

♦ Process: A healthcare service provided to, or on behalf of, a patient. This may include, but is not limited to, measures that address adherence to recommendations for clinical practice based on evidence or consensus.

♦ <u>Structure</u>: Features of a healthcare organization or clinician relevant to the capacity to provide healthcare. This may include, but is not limited to, measures that address health IT infrastructure, provider capacity, systems, and other healthcare infrastructure supports.

Measure Steward: Refers to the party responsible for updating and maintaining a measure.

CMS Program(s): Refers to the applicable Medicare program(s) that may adopt the measure through rulemaking in the future.

Measures under Consideration

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0002	Skilled Nursing Facility Healthcare-Associated Infections Requiring Hospitalization	This measure will estimate the risk-adjusted rate of healthcare-associated infections (HAIs) that are acquired during skilled nursing facility (SNF) care and result in hospitalizations. The measure is risk adjusted to "level the playing field" and to allow comparison of measure performance based on residents with similar characteristics between SNFs. It is important to recognize that HAIs in SNFs are not considered "never-events." The goal of this risk-adjusted measure is to identify SNFs that have notably higher rates of HAIs that are acquired during SNF care and result in hospitalization, when compared to their peers.	Outcome	Centers for Medicare & Medicaid Services	SNF QRP
MUC20-0003	Hospital-Level, Risk-Standardized Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA)	The measure will estimate a hospital-level, risk-standardized improvement rate for PROs following elective primary THA/TKA for Medicare fee-for-service (FFS) patients 65 years of age or older. Substantial clinical benefit improvement will be measured by the change in score on the joint-specific patient-reported outcome measure (PROM) instruments, measuring hip or knee pain and functioning, from the preoperative assessment (data collected 90 to 0 days before surgery) to the postoperative assessment (data collected 270 to 365 days following surgery).	Patient Reported Outcome	Centers for Medicare & Medicaid Services	Hospital IQR Program
MUC20-0004	Appropriate Treatment for ST-Segment Elevation Myocardial Infarction (STEMI) Patients in the Emergency Department (ED)	The percentage of emergency department (ED) patients with a diagnosis of ST-segment elevation myocardial infarction (STEMI) who received appropriate treatment. The measure will be calculated using electronic health record (EHR) data and is intended for use at the facility level.	Process	Centers for Medicare & Medicaid Services	Hospital OQR Program

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0005	Breast Screening Recall Rates	The Breast Screening Recall Rates measure calculates the percentage of beneficiaries with mammography or digital breast tomosynthesis (DBT) screening studies that are followed by a diagnostic mammography, DBT, ultrasound, or magnetic resonance imaging (MRI) of the breast in an outpatient or office setting within 45 days.	Outcome	Centers for Medicare & Medicaid Services	Hospital OQR Program
MUC20-0015	Asthma/Chronic Obstructive Pulmonary Disease (COPD) Episode-Based Cost Measure	The Asthma/COPD cost measure evaluates a clinician group's risk-adjusted cost to Medicare for patients receiving medical care to manage asthma or COPD. The measure score is a clinician group's weighted average of risk-adjusted cost for each episode attributed to the clinician group, where each episode is weighted by the number of assigned days during the episode. This chronic measure includes services that are clinically related and under the reasonable influence of the attributed clinician group. Services are assigned during an Asthma/COPD episode, which is a portion of the overall time period of a clinician group's responsibility for managing a patient's asthma or COPD. Medicare beneficiaries enrolled in Medicare Parts A and B during the performance period are eligible for the measure.	Cost/Resource Use	Centers for Medicare & Medicaid Services	MIPS

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0016	Colon and Rectal Resection Episode-Based Cost Measure	The Colon and Rectal Resection cost measure evaluates clinicians' risk-adjusted cost to Medicare for patients who receive colon or rectal resections for either benign or malignant indications. The measure score is a clinician's average risk-adjusted cost for the episode group across all attributed episodes. This inpatient procedural measure includes services that are clinically related and under the reasonable influence of the attributed clinician during the 15 days prior to the clinical event that opens or "triggers" the episode through 90 days after. Medicare beneficiaries enrolled in Medicare Parts A and B during the performance period are eligible for the measure.	Cost/Resource Use	Centers for Medicare & Medicaid Services	MIPS
MUC20-0017	Diabetes Episode-Based Cost Measure	The Diabetes cost measure evaluates a clinician group's risk-adjusted cost to Medicare for patients receiving medical care to manage type 1 or type 2 diabetes. The measure score is a clinician group's weighted average of risk-adjusted cost for each episode attributed to the clinician group, where each episode is weighted by the number of assigned days during the episode. This chronic measure includes services that are clinically related and under the reasonable influence of the attributed clinician group. Services are assigned during a Diabetes episode, which is a portion of the overall time period of a clinician group's responsibility for managing a patient's diabetes. Medicare beneficiaries enrolled in Medicare Parts A and B during the performance period are eligible for the measure.	Cost/Resource Use	Centers for Medicare & Medicaid Services	MIPS

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0018	Melanoma Resection Episode-Based Cost Measure	The Melanoma Resection cost measure evaluates clinicians' risk-adjusted cost to Medicare for patients who undergo an excision procedure to remove a cutaneous melanoma. The measure score is a clinician's average risk-adjusted cost for the episode group across all episodes attributed to the clinician. This procedural measure includes services that are clinically related and under the reasonable influence of the attributed clinician during the 30 days prior to the clinical event that opens or "triggers" the episode through 90 days after. Medicare beneficiaries enrolled in Medicare Parts A and B during the performance period are eligible for the measure.	Cost/Resource Use	Centers for Medicare & Medicaid Services	MIPS
MUC20-0019	Sepsis Episode-Based Cost Measure	The Sepsis cost measure evaluates clinicians' risk-adjusted cost to Medicare for patients who receive inpatient medical treatment for sepsis. The measure score is a clinician's average risk-adjusted cost for the episode group across all attributed episodes. This acute inpatient medical condition measure includes services that are clinically related and under the reasonable influence of the attributed clinician's role in managing care during each episode from the clinical event that opens or "triggers" the episode through 45 days after. Medicare beneficiaries enrolled in Medicare Parts A and B during the performance period are eligible for the measure.	Cost/Resource Use	Centers for Medicare & Medicaid Services	MIPS

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0030	Hospice Care Index	The Hospice Care Index monitors a broad set of leading, claims-based indicators of hospice care processes. The ten indicators reflect care throughout the hospice stay and by the care team within the domains of higher levels of care, visits by nursing staff, patterns of live discharge, and per-beneficiary spending. Index scores are calculated as the total instances a hospice exceeds a threshold for each of the 10 indicators. The index thereby seeks to identify hospices which are outliers across an array of multifaceted indicators, simultaneously.	Composite	Centers for Medicare & Medicaid Services	Hospice
MUC20-0032	Global Malnutrition Composite Score	Composite measure consisting of 4 component measures of optimal malnutrition care focuses on adults 65 years and older admitted to inpatient service who received care appropriate to their level of malnutrition risk and/or malnutrition diagnosis if identified. Appropriate care for inpatients includes to malnutrition risk screening, nutrition assessment for that at-risk, and proper malnutrition severity indicated along with a corresponding nutrition care plan that recommends treatment approach. The specifications for this measure have been updated since it was submitted to the MAP in 2018.	Composite	Academy of Nutrition and Dietetics	Hospital IQR Program; Promoting Interoperability (EH-CAH)
MUC20-0033	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	This is a measure of days at home or in community settings (that is, not in unplanned acute or emergent care settings) for patients with complex, chronic conditions in Shared Savings Program (SSP) Accountable Care Organizations (ACOs). The measure includes risk adjustment for differences in patient mix across ACOs, with an adjustment based on patients' risk of death. A policy-based nursing home adjustment that accounts for patients' risk of transitioning to a long-term nursing home is also applied to incentivize community-based care.	Outcome	Centers for Medicare & Medicaid Services	MSSP

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0034	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	Annual risk-standardized rate of acute, unplanned cardiovascular-related admissions among Medicare Fee-for-Service (FFS) patients aged 65 years and older with heart failure (HF) or cardiomyopathy.	Outcome	Centers for Medicare & Medicaid Services	MIPS
MUC20-0039	Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	The standardized hospitalization ratio is defined as the ratio of the number of hospital admissions that occur for Medicare ESRD dialysis patients treated at a particular facility to the number of hospitalizations that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with more than 5 patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.	Outcome	Centers for Medicare & Medicaid Services	ESRD QIP
MUC20-0040	Intervention for Prediabetes	Percentage of patients aged 18 years and older with identified abnormal lab result in the range of prediabetes during the 12-month measurement period who were provided an intervention.	Process	American Medical Association	MIPS

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0042	Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM)	The Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM) uses the PCPCM PROM (a comprehensive and parsimonious set of 11 patient-reported items) to assess the broad scope of primary care. Unlike other primary care measures, the PCPCM PRO-PM measures the high value aspects of primary care based on a patient's relationship with the provider or practice. Patients identify the PCPCM PROM as meaningful and able to communicate the quality of their care to their clinicians and/or care team. The items within the PCPCM PROM are based on extensive stakeholder engagement and comprehensive reviews of the literature.	Patient Reported Outcome	The American Board of Family Medicine	MIPS
MUC20-0043	Preventive Care and Wellness (composite)	Percentage of patients who received age- and sex-appropriate preventive screenings and wellness services. This measure is a composite of seven component measures that are based on recommendations for preventive care by the U.S. Preventive Services Task Force (USPSTF), Advisory Committee on Immunization Practices (ACIP), and American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE).	Composite	Centers for Medicare & Medicaid Services	MIPS
MUC20-0044	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	This measure tracks SARS-CoV-2 vaccination coverage among healthcare personnel (HCP) in IPPS hospitals, inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs), inpatient psychiatric facilities, ESRD facilities, ambulatory surgical centers, hospital outpatient departments, skilled nursing facilities, and PPS-exempt cancer hospitals.	Process	Centers for Disease Control and Prevention	ASCQR; ESRD QIP; Hospital IQR Program; Hospital OQR Program; IPFQR; IRF QRP; LTCH QRP; PCHQR; SNF QRP

MUC ID	Measure Title	Description	Measure Type	Measure Steward	CMS Program(s)
MUC20-0045	SARS-CoV-2 Vaccination by Clinicians	Percentage of patients aged 18 years and older seen for an ambulatory care visit during the measurement period who have ever received a SARS-CoV-2 vaccination dose OR who reported having ever received a SARS-CoV-2 vaccination dose.	Process	Centers for Medicare & Medicaid Services	MIPS
MUC20-0048	SARS-CoV-2 Vaccination Coverage for Patients in End-Stage Renal Disease (ESRD) Facilities	This measure tracks SARS-CoV-2 vaccination coverage among patients in End-Stage Renal Disease (ESRD) facilities.	Process	Centers for Disease Control and Prevention	ESRD QIP

APPENDIX A: MEASURE SPECIFICATIONS

Table Legend for Measure Specifications

MUC ID: Gives users an identifier to refer to a unique measure.

Measure Title: The title of the measure.

Numerator: The numerator reflects the subset of patients in the denominator for whom a particular service has been provided or for whom a particular outcome has been achieved.

Denominator: The lower part of a fraction used to calculate a rate, proportion, or ratio. The denominator is associated with a given patient population that may be counted as eligible to meet a measure's inclusion requirements.

Exclusions/Exceptions: Exclusions are patients included in an initial population for whom there are valid reasons a process or outcome of care has not occurred. When clinical judgment is allowed, these are referred to as "exceptions." Denominator exceptions fall into three general categories: medical reasons, patients' reasons, and system reasons. Exceptions must be captured in a way that they could be reported separately. For further background, the following definitions are from the CMS Measures Management System Blueprint (v. 16.0):

> *Denominator Exception*. Those conditions that should remove a patient, procedure, or unit of measurement from the denominator of the performance rate only if the numerator criteria are not met. A denominator exception allows for adjustment of the calculated score for those providers with higher risk populations. A denominator exception also provides for the exercise of clinical judgment and should be specifically defined where capturing the information in a structured manner fits the clinical workflow. A denominator exception is used only in proportion measures. These cases are removed from the denominator. However, the number of patients with valid exceptions may still be reported.
> *Denominator Exclusion.* Patients who should be removed from the measure population and denominator before determining if numerator criteria are met. Denominator exclusions are used in proportion and ratio measures to help narrow the denominator. For example, patients with bilateral lower extremity amputations would be listed as a denominator exclusion for a measure requiring foot exams.
> *Numerator Exclusion.* Defines instances that should not be included in the numerator data. Numerator exclusions are used only in ratio and proportion measures.

Measure Specifications

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0002	Skilled Nursing Facility Healthcare-Associated Infections Requiring Hospitalization	To calculate the measure numerator, we first count the outcome and then apply risk-adjustment. The final measure numerator is the adjusted numerator. Measure Outcome - Unadjusted. The unadjusted numerator is the number of stays with an HAI acquired during SNF care and results in an inpatient hospitalization. The hospitalization must occur during the period beginning on day 4 after SNF admission and within 3 days after SNF discharge. Emergency department visits and observations stays are excluded from the numerator. HAIs are identified using both the principal diagnosis code and the Present on Admission (POA) indicator on the re-hospitalization claim. An HAI is excluded from the numerator if it is a pre-existing infection. A pre-existing infection is defined as an HAI that was reported in any of the diagnosis code fields on the most proximal hospitalization claim prior to the SNF admission with a discharge date that is less than 14 days from the admission date of the readmitting IP stay. The pre-existing infection recorded in the prior proximal hospitalization must be a diagnosis that is related to the	To calculate the measure denominator, we first count the number of eligible stays and then apply risk-adjustment. The final measure denominator is the adjusted denominator. Unadjusted Denominator: Part A FFS Medicare SNF stays during the measurement period. Adjusted Denominator: The measure denominator is the risk-adjusted "expected" number of SNF stays with the measure outcome. The calculation of the "expected" number of stays starts with the total eligible SNF stays which is then risk adjusted for resident characteristics excluding the SNF effect. The "expected" number of stays with the measure outcome represents the predicted number of stays with the measure outcome if the same SNF residents were treated in the "average" SNF.	SNF stays are excluded from the denominator if they meet one or more of the following criteria: Resident is under 18 years old at SNF admission; Resident is not continuously enrolled in Part A FFS Medicare during the measurement period (1 year before SNF admission and 3 days after discharge); SNF length of stay was shorter than 4 days; SNF stay cannot be matched to prior inpatient stay within 30 days before SNF admission; Resident was transferred to federal hospital; SNF stay has zero Medicare payment; Provider of stay is outside of the 50 U.S. states, Puerto Rico, or U.S. Territory; SNF stay does not have complete information for measure construction and risk adjustment.

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0002 (cont'd)	Skilled Nursing Facility Healthcare-Associated Infections Requiring Hospitalization	HAI recorded in the re-hospitalization. Measure Outcome - Adjusted. The final numerator is a risk-adjusted estimate of the number of SNF stays predicted to have an HAI that results in hospitalization. This estimate starts with the observed count of the measure outcome, which is then risk adjusted for resident characteristics and a statistical estimate of the measured SNF's effect beyond resident case mix. The SNF effect accounts for clustering of patients within the same facility and captures variation in the measure outcome across SNFs, which helps isolate the differences in measure performance that are due to provider-specific behavior and characteristics.		

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0003	Hospital-Level, Risk-Standardized Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA)	The numerator is the risk-adjusted proportion of patients undergoing an elective primary THA/TKA who meet or exceed a substantial clinical benefit threshold of improvement between preoperative and postoperative assessments on joint-specific PROM surveys as follows:-For THA patients, meeting or exceeding the substantial clinical benefit of a 22-point increase in score on the Hip dysfunction and Osteoarthritis Outcome Score for Joint Replacement (HOOS, JR)1, and-For TKA patients, meeting or exceeding the substantial clinical benefit threshold of a 20-point increase in score on the Knee injury and Osteoarthritis Outcome Score for Joint Replacement (KOOS, JR)2. References 1. Lyman S, Lee YY, Franklin PD, Li W, Mayman DJ, Padgett DE. (2016a). Validation of the HOOS, JR: A Short-form Hip Replacement Survey. Clinical Orthopaedics and Related Research®, 474(6):1472-1482. 2. Lyman S, Lee YY, Franklin PD, Li W, Cross MB, Padgett DE. (2016b). Validation of the KOOS, JR: A Short-form Knee Arthroplasty Outcomes Survey. Clinical Orthopaedics and Related Research®, 474(6):1461-1471.	The cohort (target population) includes Medicare FFS patients 65 years of age and older undergoing elective primary THA/TKA procedures.	Denominator exclusion: Patients with staged procedures, defined as two or more elective primary THA or TKA procedures performed on the same patient during distinct hospitalizations during the measurement period, are excluded from the measure. The overlapping recovery period for staged procedures occurring within one year of each other makes including them in a PRO-PM cohort difficult in two ways: 1) the recovery from one procedure may negatively impact recovery from the other procedure; and 2) it may be challenging to fully distinguish the recovery for either of the procedures from the other with postoperative PRO data. (collected 270 to 365 days after surgery). Therefore, at this time, the measure focuses on patients receiving unilateral or simultaneous bilateral (not staged) THA/TKA procedures.

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0004	Appropriate Treatment for ST-Segment Elevation Myocardial Infarction (STEMI) Patients in the Emergency Department (ED)	ED STEMI patients whose time from ED arrival to fibrinolysis is 30 minutes or fewer OR Non-transfer ED STEMI patients who received percutaneous coronary intervention (PCI) at a PCI-capable hospital within 90 minutes of arrival ORED STEMI patients who were transferred to a PCI-capable hospital within 45 minutes of ED arrival at a non-PCI capable hospital.	ED patients with STEMI who should have received appropriate treatment for STEMI.	Denominator Exclusions. The following conditions exclude patients from the measure if they appear as Active in the EHR at the time of the ED encounter: Mortality in the ED; Active bleeding or bleeding diathesis (excluding menses); Intracranial or intraspinal surgery; Ischemic stroke; Known malignant intracranial neoplasm (primary or metastatic); Known structural cerebral vascular lesion (e.g., AVM); Significant facial and/or closed head trauma, intracranial hemorrhage, or other known intracranial pathology; Suspected aortic dissection; Active peptic ulcer; Cardiopulmonary arrest; For streptokinase/anistreplase: prior exposure or prior allergic reaction to these agents; Intubation Oral anticoagulant therapy; Patients with advanced dementia; Pregnancy; Internal bleeding; Major surgery; Severe neurologic impairment (based on Glasgow coma scale).

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0005	Breast Screening Recall Rates	Medicare beneficiaries who had a diagnostic mammography study, DBT, ultrasound, or MRI of the breast following a screening mammography or DBT study on the same day or within 45 days of the screening study.	Medicare beneficiaries who underwent a screening mammography or DBT study at a facility reimbursed through the Outpatient Prospective Payment System (OPPS).	This measure does not have any exclusions.
MUC20-0015	Asthma/Chronic Obstructive Pulmonary Disease (COPD) Episode-Based Cost Measure	The numerator for the Asthma/COPD measure is the sum of the ratio of observed to expected payment-standardized cost to Medicare for all episodes attributed to a clinician. This sum is then multiplied by the national average observed episode cost to generate a dollar figure. Mathematically, this is represented as: sum of (observed episode cost/expected episode cost) * national average observed cost.	The denominator for the Asthma/COPD measure is the total number of episodes from this episode group attributed to a clinician.	The following episode-level exclusions apply: (a) The beneficiary has a primary payer other than Medicare for any amount of time overlapping the episode window or in the lookback period. (b) No attributed clinician is found for the episode. (c) The beneficiary's date of birth is missing. (d) The beneficiary's death date occurred before the episode ended. (e) The beneficiary was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or is enrolled in Part C for any part of the lookback period plus episode window. (f) The episode trigger claim was not performed in an office, IP, OP, or ASC setting based on its place of service. Exclusions specific to the Asthma/COPD measure are developed with input from the Asthma/COPD Clinician Expert Workgroup.

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0016	Colon and Rectal Resection Episode-Based Cost Measure	The numerator for the Colon and Rectal Resection measure is the sum of the ratio of observed to expected payment-standardized cost to Medicare for all episodes attributed to a clinician. This sum is then multiplied by the national average observed episode cost to generate a dollar figure. Mathematically, this is represented as: sum of (observed episode cost/expected episode cost) * national average observed cost.	The denominator for the Colon and Rectal Resection measure is the total number of episodes from this episode group attributed to a clinician.	The following episode-level exclusions apply: (a) The beneficiary has a primary payer other than Medicare for any amount of time overlapping the episode window or in the lookback period. (b) No attributed clinician is found for the episode. (c) The beneficiary's date of birth is missing. (d) The beneficiary's death date occurred before the episode ended. (e) The beneficiary was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or is enrolled in Part C for any part of the lookback period plus episode window. (f) The episode trigger claim was not performed in an office, IP, OP, or ASC setting based on its place of service. Exclusions specific to the Colon and Rectal Resection measure are developed with input from the Colon and Rectal Resection Clinician Expert Workgroup.

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0017	Diabetes Episode-Based Cost Measure	The numerator for the Diabetes measure is the sum of the ratio of observed to expected payment-standardized cost to Medicare for all episodes attributed to a clinician. This sum is then multiplied by the national average observed episode cost to generate a dollar figure. Mathematically, this is represented as: sum of (observed episode cost/expected episode cost) * national average observed cost.	The denominator for the Diabetes measure is the total number of episodes from this episode group attributed to a clinician.	The following episode-level exclusions apply: (a) The beneficiary has a primary payer other than Medicare for any amount of time overlapping the episode window or in the lookback period. (b) No attributed clinician is found for the episode. (c) The beneficiary's date of birth is missing. (d) The beneficiary's death date occurred before the episode ended. (e) The beneficiary was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or is enrolled in Part C for any part of the lookback period plus episode window. (f) The episode trigger claim was not performed in an office, IP, OP, or ASC setting based on its place of service. Exclusions specific to the Diabetes measure are developed with input from the Diabetes Clinician Expert Workgroup.
MUC20-0018	Melanoma Resection Episode-Based Cost Measure	The numerator for the Melanoma Resection measure is the sum of the ratio of observed to expected payment-standardized cost to Medicare for all episodes attributed to a clinician. This sum is then multiplied by the national average observed episode cost to generate a dollar figure. Mathematically, this is represented as: sum of (observed episode cost/expected episode	The denominator for the Melanoma Resection measure is the total number of episodes from this episode group attributed to a clinician.	The following episode-level exclusions apply: (a) The beneficiary has a primary payer other than Medicare for any amount of time overlapping the episode window or in the lookback period. (b) No attributed clinician is found for the episode. (c) The beneficiary's date of birth is missing. (d) The beneficiary's death date occurred

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0018 (cont'd)	Melanoma Resection Episode-Based Cost Measure	cost) * national average observed cost.		before the episode ended. (e) The beneficiary was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or is enrolled in Part C for any part of the lookback period plus episode window. (f) The episode trigger claim was not performed in an office, IP, OP, or ASC setting based on its place of service. Exclusions specific to the Melanoma Resection measure are developed with input from the Melanoma Resection Clinician Expert Workgroup.
MUC20-0019	Sepsis Episode-Based Cost Measure	The numerator for the Sepsis measure is the sum of the ratio of observed to expected payment-standardized cost to Medicare for all episodes attributed to a clinician. This sum is then multiplied by the national average observed episode cost to generate a dollar figure. Mathematically, this is represented as: sum of (observed episode cost/expected episode cost) * national average observed cost.	The denominator for the Sepsis measure is the total number of episodes from this episode group attributed to a clinician.	The following episode-level exclusions apply: (a) The beneficiary has a primary payer other than Medicare for any amount of time overlapping the episode window or in the lookback period. (b) No attributed clinician is found for the episode. (c) The beneficiary's date of birth is missing. (d) The beneficiary's death date occurred before the episode ended. (e) The beneficiary was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or is enrolled in Part C for any part of the lookback period plus episode window. (f) The episode trigger claim was not performed in an office, IP, OP, or ASC setting

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0019 (cont'd)	Sepsis Episode-Based Cost Measure			based on its place of service. Exclusions specific to the Sepsis measure are developed with input from the Sepsis Expert Workgroup.
MUC20-0030	Hospice Care Index	This index numerator is based on an approved NQF approach and does not have a traditional numerator. The index score is calculated as the total number of indicators (10) less the number of instances a hospice surpasses a threshold among ten provider-level indicators. Nine of the ten indicators are distribution-based: for example, all hospices meeting the criteria of "the bottom 10% of hospices by nursing minutes per day" would be flagged for that indicator, and their index score would be at most 10-1=9 to reflect meeting the threshold for that instance. The remaining threshold is triggered by the absence of higher levels of service. Therefore the potential range of scores is from 0 to 10. The ten indicators that comprise the composite do have their own numerator (and denominator) statements; the indicators are listed below with corresponding numerator definitions [in brackets]. 1. Hospice provided no Continuous Home Care (CHC) & General Inpatient (GIP) [numerator: number of GIP and CHC days]; 2. Gaps in nursing visits	This index denominator is based on an approved NQF approach and does not have a traditional denominator. All hospices with claims data for the period of performance not otherwise excluded (see below) are assigned an index score. The ten indicators that comprise the composite do have their own denominator statements (and numerator, per above); the indicators are listed below with corresponding denominator definitions [in brackets]. 1. Hospice provided no Continuous Home Care (CHC) & General Inpatient (GIP) [denominator: all hospices service days]; 2. Gaps in nursing visits greater than 7 days [denominator: number of elections enrolled at least 30 days]; 3. Nurse minutes per Routine Home Care (RHC) day [denominator: number of RHC service days]; 4. Live discharges in the first 7 days of hospice [denominator: number of live discharges]; 5. Live discharges on or after	Hospices with fewer than 20 discharges in the year are not assigned a calculated index score per convention of the quality reporting program (requiring sufficient data available to calculate reliable scores for publicly displayed measures).

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0030 (cont'd)	Hospice Care Index	greater than 7 days [numerator: number of elections a gap in nursing visits exceeds 7 days]; 3. Nurse minutes per Routine Home Care (RHC) day [numerator: total nursing minutes during RHC days]; 4. Live discharges in the first 7 days of hospice [numerator: number of live discharges within 7 days of hospice admission]; 5. Live discharges on or after the 180th day of hospice [numerator: number of live discharges after 180 days of hospice enrollment]; 6. Burdensome transitions (Type 1), live discharges from hospice followed by hospitalization followed by hospice readmission [numerator: number of live discharges followed by hospital admission, then hospice re-admission]; 7. Burdensome transitions (Type 2), live discharges from hospice followed by hospitalization with the patient dying in the hospital [numerator: number of live discharges followed by hospital admission with death in the hospital]; 8. Skilled nurse visits on weekends [numerator: sum of minutes during nursing visits on Saturdays or Sundays]; 9. Per-beneficiary spending [numerator: total payments received by a provider in a year]; 10. Receiving visits near death [numerator: the number of decedent beneficiaries	the 180th day of hospice [denominator: number of live discharges]; 6. Burdensome transitions (Type 1), live discharges from hospice followed by hospitalization followed by hospice readmission [denominator: number of live discharges]; 7. Burdensome transitions (Type 2), live discharges from hospice followed by hospitalization with the patient dying in the hospital [denominator: number of live discharges]; 8. Skilled nurse visits on weekends [denominator: total skilled nursing minutes during RHC service days]; 9. Per-beneficiary spending [denominator: total number of beneficiaries electing hospice with the provider that year]; 10. Receiving visits near death [denominator: the number of decedent beneficiaries].	

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0030 (cont'd)	Hospice Care Index	receiving a visit by a skilled nurse or social worker in last three days of life].		
MUC20-0032	Global Malnutrition Composite Score	The Global Malnutrition Composite Score is comprised of four component measures which are scored separately and whose population is sourced from the overall composite measure denominator. 1. Screening for malnutrition risk at admission. 2. Completion of a nutrition assessment for patients who screened for risk of malnutrition. 3. Appropriate documentation of malnutrition diagnosis for patients identified with malnutrition. 4. Development of a nutrition care plan for malnourished patients. The composite measure score is calculated by summing and then averaging the performance scores for each of the four component measures included in the overall composite measure. Each component measure is a proportion measure.	The measure population from which the composite's component measures are sourced from are patients age 65 years and older who are admitted to an acute inpatient hospital.	1. All Four Component Measures: patients with a length of stay less than 24 hours; 2. Component Measure #1 only: admission to screening time interval greater than 48 hours; 3. Component Measure #3 and #4 only: discharge status of hospice or left against medical advice.
MUC20-0033	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	The measure outcome is days at home for a patient in the measure period, defined as the total number of eligible patient days minus the number of days spent in specified acute care settings (that is, a "day at home" is any day alive and not in care). The specified care settings are: inpatient acute and post-acute facilities, comprising short-term	The denominator includes patients meeting all of the following criteria: Adult (age 18 or older); Medicare Fee-for-Service beneficiary continuously enrolled in Medicare parts A and B during the full performance year (up to date of death among patients who died)	There are currently no denominator exclusions or exceptions for the measure. All patients meeting the denominator inclusion criteria are included. There are two numerator exclusions from the measure outcome. As noted, all admissions to select care settings are considered "days in care"

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0033 (cont'd)	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	acute care hospitals, critical access hospitals (CAHs), inpatient rehabilitation facilities (IRFs), inpatient psychiatric facilities (IPFs), long-term care hospitals (LTCHs), and skilled nursing facilities; emergency department (ED) visits; and observation stays. Any day on which a patient is admitted to one of these settings is a "day in care", except for obstetric admissions, or if the patient is enrolled in hospice (during which a patient will be considered "at home" regardless of care use). Other types of care settings (including outpatient visits and procedures, hospice; residential psychiatric and substance abuse facilities, assisted living facilities and group homes, and home health and telehealth services) are not considered "days in care" for the purpose of this measure; rather they are treated as "days at home." To ensure ACOs are not incentivized to withhold medically necessary care, the Days at Home measure accounts for higher-than-expected mortality rates, by adjusting days at home by the standardized mortality ratio. The numerator does not count days spent in long term (residential) nursing homes, as dates of these services are not reliably captured in Medicare claims. In response to CMS's policy-based	and one full year prior; With an average Hierarchical Condition Category (HCC) composite risk score >= 2.0 in the pre-performance year; and Attributed to (that is, a patient of) a participating ACO as determined by SSP. The measure includes patients alive as of the first day of the performance year. Patients who die during the performance period are included up to date of death.	unless: The patient is enrolled in hospice at the time of service (rationale: to promote effective and appropriate care for terminally ill patients), or The patient is admitted for childbirth, miscarriage, or termination of pregnancy (rationale: these obstetric admissions do not indicate care quality and counting them may create perverse incentives for care of pregnant patients).

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0033 (cont'd)	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	recommendation that days in a nursing home should not be considered "days at home," the measure scores are adjusted based on how frequently patients transition from living at home to a residential nursing home during the performance year, such that ACOs with fewer transitions than expected receive better scores. Notably, the measure only considers transitions to nursing homes during the performance year, which may have been affected by an ACO's performance; patients already living in a nursing home at the start of the performance year are considered to be at home. The numerator will be calculated based on three risk-adjusted statistical models. First, "excess days in care" for each patient are modeled using a hierarchical negative binomial regression with an offset for days alive. "Excess days in care" is defined as predicted minus expected days in care, where "predicted" includes clinical risk adjustment, survival offset, and an ACO-specific effect, and "expected" includes only clinical risk adjustment and survival offset. Second, mortality is modeled using a hierarchical logistic regression model with adjustment for the		

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0033 (cont'd)	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	patient case-mix, to calculate a standardized mortality rate (SMR) at the patient level. A high SMR indicates a patient at greater-than-expected risk of death due to their ACO's performance. Third, a patient's risk of transitioning to a residential nursing home is modeled using a hierarchical logistic regression model with adjustment for patient case-mix and Medicaid dual-eligibility status, to calculate a standardized "nursing home ratio" (NHR) and then scaled to have the same mean and standard deviation as the SMR. A higher NHR indicates a patient at greater-than-expected risk of transitioning to a nursing home due to their ACO's performance. For the mortality adjustment for each patient, "excess days in care" is multiplied by SMR (if excess days >= 0) or divided by SMR (if excess days < 0), such that a greater SMR results in an absolute increase of "excess days in care" (that is, ACOs are rewarded for lower mortality than expected than expected. Similarly, for the policy-based nursing home adjustment for each patient "excess days in care" is multiplied by [0.5*NHR] (if excess days < 0) or divided by [0.5*NHR] (if excess days >= 0) so that ACOs are rewarded for lower rates of		

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0033 (cont'd)	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	transition to the nursing home than expected. The SMR and NHR adjustments are combined additively to give a "mortality- and nursing home transition risk-adjusted excess days in care," which is subtracted from the patient-level national average of days alive, resulting in a risk-, mortality, and nursing home transition-adjusted measure of "days at home." Finally, the adjusted days at home are averaged over all patients of each ACO to summarize the ACO's measure performance as the "ACO-level adjusted days at home."		
MUC20-0034	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	The outcome for this measure is the number of acute cardiovascular-related admissions per 100 person-years at risk for admission during the measurement year. Time at risk is calculated as the number of days a patient is alive, from the start of the measurement period or first visit, until heart transplantation, LVAD implantation, or home inotropic therapy; enrollment in hospice; death; or the end of the measurement period. Time not considered at risk and excluded: Days spent in a hospital, SNF, or acute rehabilitation facility; 10 days following discharge from a hospital, SNF, or acute rehabilitation facility; and Time during and after LVAD	The measure includes Medicare FFS beneficiaries ≥65 years of age with at least one inpatient principal diagnosis for heart failure/cardiomyopathy, or at least two outpatient or inpatient heart failure/cardiomyopathy diagnoses in any coding position (e.g., primary or secondary position) within the two years prior to the measurement year. Beneficiaries must be enrolled full-time in Medicare Part A and B during the year prior to measurement and during the measurement period. Additionally, the	Numerator Exclusions: The measure does not include the following types of admissions in the outcome because they do not reflect the quality of care provided by ambulatory care clinicians who are managing the care of HF patients: Planned admissions (utilizes the adapted planned admission algorithm (PAA) to identify and exclude admissions that are planned); Admissions that likely do not reflect the quality of heart failure management provided by ambulatory clinicians including: Admissions that occur within 10 days of discharge from a hospital, skilled nursing facility, or acute rehabilitation facility ("10-day

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0034 (cont'd)	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	implantation, home inotropic therapy, or heart transplantation. Acute cardiovascular-related admissions are defined using individual ICD-10-CM codes and the Agency for Healthcare Research and Quality's (AHRQ) Clinical Classification Software (CCS) diagnosis categories, which group clinically similar codes together. AHRQ CCS diagnosis categories used to define outcome: 55: Fluid and electrolyte disorders; 96: Heart valve disorders; 97: Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease); 98: Essential hypertension; 100: Acute myocardial infarction; 102: Nonspecific chest pain; 104: Other and ill-defined heart disease; 105: Conduction disorders; 106: Cardiac dysrhythmias; 107: Cardiac arrest and ventricular fibrillation; 108: Congestive heart failure; non-hypertensive; 110: Occlusion or stenosis of precerebral arteries; 112: Transient cerebral ischemia; 115: Aortic; peripheral; and visceral artery aneurysms; 116: Aortic and peripheral arterial embolism or thrombosis; 157: Acute and unspecified renal failure; 245: Syncope. Subsets of the following AHRQ CCS diagnosis categories used to define outcome: 99: Hypertension with complications	cohort excludes: Patients with internalized left ventricular assist devices (LVADs); Patients with heart transplants; Patients on home inotropic therapy; Patients on hospice for any reason; Patients with end-stage renal disease (ESRD) – defined as chronic kidney disease stage 5 or on dialysis. Provider types included for measurement (vetted by TEP and Clinician Committee): Primary care providers (PCPs): CMS designates PCPs as physicians who practice internal medicine, family medicine, general medicine, or geriatric medicine, and non-physician providers, including nurse practitioners, certified clinical nurse specialists, and physician assistants; Cardiologists: Cardiologists are covered by the measure because they provide overall coordination of care for patients with HF and manage the conditions that put HF patients at risk for admission due to acute cardiovascular-related conditions. Outcome attribution: We begin by assigning each patient to the clinician most responsible for	buffer period"); Admissions that occur while patients are enrolled in Medicare's hospice benefit; Admissions that occur prior to the first visit with the assigned clinician. Admissions on the date or after any of the following: LVAD implantation, home inotropic therapy, or heart transplant (censored at the time of transition to advanced care). Denominator Exclusions: The measure excludes: 1. Patients without continuous enrollment in Medicare Parts A and B for the duration of the measurement period. 2. Patients who (or until death), were ever in hospice during the year prior to the measurement year or in hospice at the start of the measurement period. 3. Patients who have had no Evaluation & Management (E&M) visits to a MIPS eligible clinician. 4. Patients who have had a heart transplant, been on home inotropic therapy, or who have had a left ventricular assist device (LVAD) placed.

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0034 (cont'd)	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	and secondary hypertension; 101: Coronary atherosclerosis and other heart disease; 103: Pulmonary heart disease; 109: Acute cerebrovascular disease; 114: Peripheral and visceral atherosclerosis; 117: Other circulatory disease; 130: Pleurisy; pneumothorax; pulmonary collapse; 131: Respiratory failure; insufficiency; arrest (adult); 133: Other lower respiratory disease; 237: Complication of device; implant or graft. The measure has several outcome exclusions: Planned admissions; Admissions from a skilled nursing facility (SNF) or acute rehab facility; Admissions within 10 days of discharge from a hospital, SNF, or acute rehab; Admissions after patient has entered hospice; Admissions before first visit to provider if no prior year visit; Admissions at time of or following: LVAD implantation, home inotropic therapy, or heart transplant.	the patient's care, based on the pattern of outpatient visits with PCPs and relevant specialists. The patient can be assigned to a PCP, a cardiologist, or can be left unassigned. A patient who is eligible for attribution is assigned to a cardiologist if they have 2 or more visits with a single cardiologist, regardless of how many visits that patient has with a PCP. There are two scenarios where a patient can be assigned to a PCP. First, if the patient has seen the PCP at least once but has no visits with a cardiologist, the patient is assigned to the PCP. Second, if the patient has seen the PCP more than 2 or more times and has only one visit with a cardiologist, the patient is assigned to the PCP. If the patient has 1 visit each with a cardiologist and a PCP, the patient is assigned to the cardiologist. If the patient has 1 visit with a cardiologist and no visit with a PCP, the patient is assigned to the cardiologist. Finally, the patient will be unassigned if they had no visits with a PCP or cardiologist. Patients are	

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0034 (cont'd)	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System		then assigned at the Taxpayer Identification Number (TIN) level, which includes solo clinicians and groups of clinicians who have chosen to report their quality under a common TIN. Patients "follow" their clinician to the TIN designated by the clinician (i.e. they are assigned to their clinician's TIN). Patients unassigned at the individual clinician-level, therefore, continue to be unassigned at the TIN level.	
MUC20-0039	Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	Number of inpatient hospital admissions among eligible patients at the facility during the reporting period.	Number of hospital admissions that would be expected among eligible patients at the facility during the reporting period, given the patient mix at the facility.	N/A
MUC20-0040	Intervention for Prediabetes	Patients who were provided an intervention.* NOTE: *Intervention must include one of the following: referral to a CDC-recognized diabetes prevention program; referral to medical nutrition therapy with a registered dietician; prescription of metformin.	All patients aged 18 years and older with identified abnormal lab result in the range of prediabetes during the 12-month measurement period. NOTE: **Abnormal lab result in the range of prediabetes includes a fasting plasma glucose level between 100 mg/dL (5.6 mmol/L) to 125 mg/dL (6.9 mmol/L) OR a 2-hour glucose during a 75g oral glucose tolerance test between 140 mg/dL (7.8 mmol/L) to 199 mg/dL	Denominator exclusions: Patients who are pregnant. Patients who have any existing diagnosis of diabetes (Type 1, Type 2, latent autoimmune diabetes of adults [LADA], monogenic diabetes [MODY]), hospice care in the ambulatory setting.

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0040 (cont'd)	Intervention for Prediabetes		(11.0 mmol/L) OR and A1C between 5.7-6.4% (39-47 mmol/mol).	
MUC20-0042	Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM)	The target population is all active patients in a practice during the performance reporting period. A patient is defined as active if the patient has had a documented interaction with the practice within 12 months of their birth month within the measurement period. The PCPCM PROM is the same for all patients, regardless of age. Because the PCPCM PROM applies to all patients and is not particular to a clinical encounter, it is administered once a year to each patient during their birth month. The target population is defined the same, regardless of unit of analysis (clinician, practice, or system).The numerator is the sum of all PCPCM PROM scores for active patients. To use the numerator for calculating the PCPCM Performance Score, please refer to the Calculation Algorithm/Measure Logic section of the attached Measure Information Form. Current national benchmark for the PCPCM Performance Measure was established by the national sample used in the published validation of the measure. Individual Benchmarks from National Pilot (n=2229) by Item Score1. My practice makes it	The denominator is the total number of complete PCPCM PROM instruments received in the reporting period. A completed PROM instrument is defined as a PROM instrument for which the patient has responded to at least 8 of 11 items. The target population is all active patients in a practice during the performance reporting period. A patient is defined as active if the patient has had a documented interaction with the practice within 12 months of their birth month during the measurement period. The PCPCM PROM is the same for all patients, regardless of age. Because the PCPCM PROM applies to all patients and is not particular to a clinical encounter, it is administered once a year to each patient during their birth month. The target population is defined the same, regardless of unit of analysis (clinician, practice, or system).	None

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0042 (cont'd)	Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM)	easy for me to get care. Mean 3.1, 78%2. My practice is able to provide most of my care. Mean 3.1, 78% 3. In caring for me, my doctor considers all the factors that affect my health. Mean 3.2. 80%4. My practice coordinates the care I get from multiple places. Mean 2.8, 70%5. My doctor or practice knows me as a person. Mean 2.9, 73%6. My doctor and I have been through a lot together. Mean 2.2, 55%7. My doctor or practice stands up for me. Mean 2.7, 68%8. The care I get takes into account knowledge of my family. Mean 2.7, 68%9. The care I get in this practice is informed by knowledge of my community. Mean 2.4, 60%10. Over time, my practice helps me to stay healthy. Mean 2.8, 70%11. Over time, my practice helps me to meet my goals. Mean 3.0, 75%National PCPCM Performance Score Benchmark: 2.8, 70%.		
MUC20-0043	Preventive Care and Wellness (composite)	Numerator 1: Patients who received an influenza immunization OR who reported previous receipt of an influenza immunization (Previous Receipt – Receipt of the current season's influenza immunization from another provider OR from same provider prior to the visit to which the measure is applied [typically, prior vaccination would include influenza vaccine given since August 1st]).	Denominator 1: All patients aged 6 months and older seen for a visit during the measurement period. Denominator 2: Patients 65 years of age and older with a visit during the measurement period. Denominator 3: Women 51 - 74 years of age with a visit during the measurement period. Denominator 4: Patients 50-	Denominator Exclusion Population 1: None. Denominator Exception Population 1: Influenza immunization was not administered for reasons documented by clinician (e.g., patient allergy or other medical reasons, patient declined or other patient reasons, vaccine not available or other system reasons). Denominator Exclusion Population 2: Patient received

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0043 (cont'd)	Preventive Care and Wellness (composite)	Numerator 2: Patients who have ever received a pneumococcal vaccination before the end of the measurement period. Numerator 3: Women with one or more mammograms during the 27 months prior to the end of the measurement period. Numerator 4: Patients with one or more screenings for colorectal cancer. Numerator 5: Patients with a documented BMI during the encounter or during the previous twelve months, AND when the BMI is outside of normal parameters, a follow-up plan is documented during the encounter or during the previous twelve months of the current encounter. Numerator 6: Patients who were screened for tobacco use at least once within 24 months; Patients who received tobacco cessation intervention; Patients who were screened for tobacco use at least once within 24 months AND who received tobacco cessation intervention if identified as a tobacco user. Numerator 7: Patients who were screened for high blood pressure AND have a recommended follow-up plan documented, as indicated, if the blood pressure is pre-hypertensive or hypertensive. Composite method: To create the composite score for this draft CQM as currently specified, we used	75 years of age with a visit during the measurement period. Denominator 5: All patients aged 18 and older on the date of the encounter with at least one eligible encounter during the measurement period. Denominator 6: All patients aged 18 years and older seen for at least two visits or at least one preventive visit during the measurement period; All patients aged 18 years and older seen for at least two visits or at least one preventive visit during the measurement period who were screened for tobacco use and identified as a tobacco user; All patients aged 18 years and older seen for at least two visits or at least one preventive visit during the measurement period. Denominator 7: All patients aged 18 years and older at the beginning of the measurement period with at least one eligible encounter during the measurement period.	hospice services any time during the measurement period. Denominator Exception Population 2: Not applicable. Denominator Exclusion Population 3: Women who had a bilateral mastectomy or who have a history of a bilateral mastectomy or for whom there is evidence of a right and a left unilateral mastectomy; Hospice services used by patient any time during the measurement period; Patients age 66 or older in Institutional Special Needs Plans (SNP) or residing in long term care; Patients 66 years of age and older with at least one claim/encounter for frailty during the measurement period AND a dispensed medication for dementia during the measurement period or the year prior to the measurement period; Patients 66 years of age and older with at least one claim/encounter for frailty during the measurement period AND either one acute inpatient encounter with a diagnosis of advanced illness or two outpatient, observation, ED or nonacute inpatient encounters on different dates of service with an advanced illness diagnosis during the measurement period or the year prior to the measurement period.

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0043 (cont'd)	Preventive Care and Wellness (composite)	component-level linear combination. First, we computed the measure score for each individual component measure (measure numerator divided by the measure denominator), and then computed the average of the seven individual scores.		Denominator Exception Population 3: Not applicable. Denominator Exclusion Population 4: Patients with a diagnosis or past history of total colectomy or colorectal cancer; Patient was provided hospice services any time during the measurement period; Patient age 66 or older in Institutional Special Needs Plans (SNP) or residing in long-term care; Patients 66 years of age and older with at least one claim/encounter for frailty during the measurement period AND a dispensed medication for dementia during the measurement period or the year prior to the measurement period; Patients 66 years of age and older with at least one claim/encounter for frailty during the measurement period AND either one acute inpatient encounter with a diagnosis of advanced illness or two outpatient, observation, ED or nonacute inpatient encounters on different dates of service with an advanced illness diagnosis during the measurement period or the year prior to the measurement period. Denominator Exception Population 4: Not applicable. Denominator Exclusion Population 5: BMI not documented, documentation the

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0043 (cont'd)	Preventive Care and Wellness (composite)			patient is not eligible for BMI calculation; BMI is documented as being outside of normal limits, follow-up plan is not documented, documentation the patient is not eligible. Denominator Exception Population 5: BMI is documented as being outside of normal limits, follow-up plan is not completed for documented reason. Denominator Exclusion Population 6: None. Denominator Exception Population 6: Documentation of medical reason(s) for not screening for tobacco use (e.g., limited life expectancy, other medical reason); Documentation of medical reason(s) for not providing tobacco cessation intervention (e.g., limited life expectancy, other medical reason); Documentation of medical reason(s) for not screening for tobacco use (e.g., limited life expectancy, other medical reason); Documentation of medical reason(s) for not providing tobacco cessation intervention if identified as a tobacco user (e.g., limited life expectancy, other medical reason). Denominator Exclusion Population 7: Patient not eligible due to active diagnosis of hypertension. Denominator

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0043 (cont'd)	Preventive Care and Wellness (composite)			Exception Population 7: Documented reason for not screening or recommending a follow-up for high blood pressure.
MUC20-0044	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Cumulative number of HCP eligible to work in the hospital or facility for at least one day during the reporting week and who received a complete vaccination course against SARS-CoV-2 since the date vaccine was first available or on a repeated interval revaccination on a regular basis is needed. A completed vaccination course may require 1 or more doses depending on the specific vaccine used. Vaccination coverage is defined as a measure of the estimated percentage of people in a sample or population who received a specific vaccine or vaccines.	Number of HCP eligible to work in the healthcare facility for at least one day during the reporting week, excluding persons with contraindications to SARS-CoV-2 vaccination.	HCP with contraindications to SARS-CoV-2 vaccination.
MUC20-0045	SARS-CoV-2 Vaccination by Clinicians	Patients who have ever received a SARS-CoV-2 vaccination dose OR who reported having ever received a SARS-CoV-2 vaccination dose.	All patients aged 18 years and older seen for an ambulatory care visit during the measurement period.	Exclusion: Patient received hospice services any time during the measurement period. Exceptions: 1. SARS-CoV-2 vaccine dose or full SARS-CoV-2 vaccination course was not administered, as documented by clinician, due to patient contraindication. 2. SARS-CoV-2 vaccine dose or full SARS-CoV-2 vaccination course was not administered, as documented by clinician, due to patient refusal. 3. SARS-CoV-2 vaccine dose or full SARS-CoV-2 vaccination course

MUC ID	Measure Title	Numerator	Denominator	Exclusions/Exceptions
MUC20-0045 (cont'd)	SARS-CoV-2 Vaccination by Clinicians			was not administered, as documented by clinician, due to vaccine being unavailable.
MUC20-0048	SARS-CoV-2 Vaccination Coverage for Patients in End-Stage Renal Disease (ESRD) Facilities	Cumulative number of patients eligible for vaccination during the reporting time-period and who received a complete vaccination course against SARS-CoV-2 since the date vaccine was first available or on a repeated interval if revaccination on a regular basis is needed. A completed vaccination course may require 1 or more doses depending on the specific vaccine used. Vaccination coverage is defined as a measure of the estimated percentage of people in a sample or population who received a specific vaccine or vaccines.	Number of patients under care for first 2 working days of reporting month in the ESRD facility eligible for vaccination during the reporting time-period, excluding persons with contraindications to SARS-CoV-2 vaccination.	Patients with contraindications to SARS-CoV-2 vaccination.

APPENDIX B: MEASURE RATIONALES

Legend for Measure Rationales

MUC ID: Gives users an identifier to refer to a unique measure.

Measure Title: The title of the measure.

Rationale: Refers to the rationale for the measure, the peer-reviewed evidence justifying the measure, and/or the impact the measure is anticipated to achieve.

Measure Rationales

MUC ID	Measure Title	Rationale
MUC20-0002	Skilled Nursing Facility Healthcare-Associated Infections Requiring Hospitalization	Healthcare associated infection (HAI) is defined as an infection acquired while receiving care at a health care facility that was not present or incubating at the time of admission. [1] If the prevention and treatment of HAIs are poorly managed, they can cause poor health care outcomes for patients and lead to wasteful resource use. Most HAIs are considered potentially preventable because they are outcomes of care related to processes or structures of care. In other words, these infections typically result from inadequate management of patients following a medical intervention, such as surgery or device implantation, or poor adherence to hygiene protocol and antibiotic stewardship guidelines. Measuring HAIs among SNF residents can therefore provide valuable information about SNFs' quality of care. HAIs are associated with longer lengths of stay, use of higher-intensity care (e.g., critical care services and hospital readmissions), and increased mortality. [2, 3, 4] HAIs also lead to increased health care costs and present an economic burden. [2,5] Addressing HAIs in SNFs is particularly important because several factors place SNF residents at high risk for infection, including increased age, cognitive and functional decline, use of indwelling devices, frequent care transitions, and close contact with other residents and health care workers. [6,7] A recent report from the OIG (2014) estimated that 1 in 4 adverse events among SNF residents are due to HAIs and that more than half of all HAIs are potentially preventable. [2] Infection prevention and control programs with core components in education, monitoring, and feedback on infection rates from surveillance programs or feedback on infection control practices from audits have been found to be successful interventions for reducing HAIs. [8] Preventing and reducing HAIs is crucial to delivering safe and high-quality care across the health care system and has been a priority objective at the federal, state, and local levels. For example, the Office of Disease Prevention and Health Promotion has created a National Action Plan to Prevent Health Care-Associated Infections, with specific attention to HAIs in long-term care facilities (LTCFs). [6] In 2017, CMS launched the Meaningful Measures framework. Making Care Safer by Reducing Harm Caused in the Delivery of Care is one of the six meaningful measure domains and is a companion priority for quality assurance and improvement work at CMS. The meaningful measure area of HAIs is under this domain. References:1. World Health Organization. (n.d.). The burden of health care-associated infection worldwide. Retrieved from https://www.who.int/gpsc/country_work/burden_hcai/en/ 2. Office of Inspector General. (2014). Adverse events in skilled nursing facilities: National incidence among Medicare beneficiaries. Retrieved from https://oig.hhs.gov/oei/reports/oei-06-11-00370.pdf 3. Ouslander, J. G., Diaz, S., Hain, D., & Tappen, R. (2011). Frequency and diagnoses associated with 7- and 30-day readmission of skilled nursing facility patients to a nonteaching community hospital. Journal of the American Medical Directors Association, 12(3), 195–203. http://dx.doi.org/10.1016/j.jamda.2010.02.015 Zimlichman et al., 2013 4. Zimlichman, E., Henderson, D., Tamir, O., Franz, C., Song, P., Yamin, C. K., . . . Bates, D. W. (2013). Health care-associated infections: A meta-analysis of costs and financial impact on the US health care system. JAMA Internal Medicine, 173(22), 2039–2046. https://pubmed.ncbi.nlm.nih.gov/23999949/ Bureau of Labor Statistics 6. Office of Disease Prevention and Health Promotion. (2013). Long-term care

MUC ID	Measure Title	Rationale
MUC20-0002 (cont'd)	Skilled Nursing Facility Healthcare-Associated Infections Requiring Hospitalization	facilities. In U.S. Department of Health and Human Services, National action plan to prevent health care-associated infections: Road map to elimination (pp. 194-239). Retrieved from: http://www.health.gov/hai/prevent_hai.asp#hai_plan 7. Montoya, A., & Mody, L. (2011). Common infections in nursing homes: A review of current issues and challenges. Aging Health, 7(6), 889–899. http://dx.doi.org/10.2217/ahe.11.80 8. Lee, M.H., Lee GA, Lee SH, Park YH (2019). Effectiveness and core components of infection prevention and control programmes in long-term care facilities: a systematic review. Retrieved from https://pubmed.ncbi.nlm.nih.gov/30794854/.

| MUC20-0003 | Hospital-Level, Risk-Standardized Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA) | Elective primary THA/TKA procedures are well-suited for PRO measurement. Unlike procedures that are intended to promote survival, these procedures are specifically intended to improve function and reduce pain, outcomes best reported by patients which makes PROs a meaningful outcome metric to assess for this population. THA/TKAs are important, effective procedures performed on a broad population, and the patient-reported outcomes for these procedures (for example, pain, mobility, and quality of life) can be measured in a scientifically sound way 7,8,9,12,15,16,18,19,23,24,25,27,29 and are influenced by a range of improvements across the full spectrum of care. THA/TKA provides a suitable environment for optimizing care, as there are many studies indicating how providers can improve outcomes of the patients by addressing aspects of pre-, peri-, and postoperative care 10,11,14,17,20,21,22,26. Optimal clinical outcomes depend not just on the surgeon performing the procedure, but also on: the entirety of the team's efforts in the care of the patient; care coordination across provider groups and specialties; and the patients' engagement in their recovery13,26. Even the best surgeon will not get outstanding results if there are gaps in the quality of care provided by others caring for the patient before, during, and/or after surgery. The goal of hospital-level outcome measurement is to capture the full spectrum of care to incentivize collaboration and shared responsibility for improving patients' health and reducing the burden of their disease. References 7. Alviar M, Olver J, Brand C, Hale T, Khan F. Do Patient-Reported Outcome Measures Used in Assessing Outcomes in Rehabilitation After Hip and Knee Arthroplasty Capture Issues Relevant to Patients? Results of a Systematic Review and ICF Linking Process. J Rehabil Med. 2011; 43:374-381. [a] 8.Alviar M, Olver J, Brand C, et al. Do Patient-Reported Outcome Measures in Hip and Knee Arthroplasty Rehabilitation Have Robust Measurement Attributes? A Systematic Review. J Rehabil Med. 2011; 43:572-583. [b]9. Bauman S, Williams D, Petruccelli D, Elliott W, de Beer J. Physical Activity After Total Joint Replacement: A Cross-Sectional Survey. Clin J Sport Med. 2007; 17(2):104-108. 10. Brown K, Topp R, Brosky JA, Lajoie AS. Prehabilitation and quality of life three months after total knee arthroplasty: a pilot study. Percept Mot Skills. Dec 2012; 115(3):765-774. 11. Choong PF, Dowsey MM, Stoney JD. Does accurate anatomical alignment result in better function and quality of life? Comparing conventional and computer-assisted total knee arthroplasty. J Arthroplasty. Jun 2009; 24(4):560-569. 12. Collins NJ, Roos EM. Patient-reported outcomes for total hip and knee arthroplasty: commonly used instruments and attributes of a "good" measure. Clin Geriatr Med. 2012; 28(3):367-394. 13. Feng JE, Novikov D, Anoushiravanni AA, Schwarzkopf R. Total knee arthroplasty: Improving outcomes with a multidisciplinary approach. J Multidiscip Healthc. 2018; 11:63-73. doi: 10.2147/JMDH.S140550. 14 Galea MP, Levinger P, Lythgo N, et al. A targeted home-and center-based exercise program for people after total hip replacement: a randomized clinical trial. Arch Phys Med Rehabil. Aug 2008; 89(8):1442-1447. 15. Jones CA, Beaupre LA, Johnston DW, Suarez-Almazor ME. Total joint arthroplasties: current concepts of patient outcomes after surgery. Rheum Dis Clin North Am. 2007; 33(1):71-86. 16. Jones CA, Pohar S. Health-related quality of life after total joint arthroplasty: a scoping review. Clin Geriatr Med. 2012; 28(3):395-429. 17. Kim KY. Perioperative orthopedic surgical home: Optimizing total joint arthroplasty candidates and preventing readmission. J Arthroplasty. 2019; 34(7s):S91-S96. doi: 10.1016/j.arth.2019.01.020. 18 Lau RL, Gandhi R, Mahomed S, Mahomed N. Patient satisfaction after total knee and hip arthroplasty. Clin Geriatr Med. 2012; 28(3):349-365. 19. Liebs TR. Quality-adjusted |

MUC ID	Measure Title	Rationale
MUC20-0003 (cont'd)	Hospital-Level, Risk-Standardized Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA)	life years gained by hip and knee replacement surgery and its aftercare. Arch Physical Med Rehabil. 2016; 97(5):691-700. doi: 10.1016/j.apmr.2015.12.021. 20. McGregor AH, Rylands H, Owen A, Dore CJ, Hughes SP. Does preoperative hip rehabilitation advice improve recovery and patient satisfaction? J Arthroplasty. Jun 2004; 19(4):464-468. 21. Moffet H, Collet JP, Shapiro SH, Paradis G, Marquis F, Roy L. Effectiveness of intensive rehabilitation on functional ability and quality of life after first total knee arthroplasty: A single blind randomized controlled trial. Arch Phys Med Rehabil. Apr 2004; 85(4):546-556. 22. Monticone M, Ferrante S, Rocca B, et al. Home-based functional exercises aimed at managing kinesiophobia contribute to improving disability and quality of life of patients undergoing total knee arthroplasty: a randomized controlled trial. Arch Phys Med Rehabil. Feb 2013; 94(2):231-239. 23. Montin L, Leino-Kilpi H, Suominen T, Lepisto J. A systematic review of empirical studies between 1966 and 2005 of patient outcomes of total hip arthroplasty and related factors. J Clin Nurs. 2008; 17(1):40-45. 24. Papalia R, Del Buono A, Zampogna B, Maffulli N, Denaro V. Sport activity following joint arthroplasty: a systematic review. Br Med Bull. 2012; 101:81-103. 25. Rolfson O, Rothwell A, Sedrakyan A, et al. Use of patient-reported outcomes in the context of different levels of data. J Bone Joint Surg Am. 2011; 3:66-71. 26. Saufl N, Owens A, Kelly I, Merrill B, Freyaldenhouen L. A multidisciplinary approach to total joint replacement. J Perianesth Nurs. 2007; 22(3):195-206.e9. 27. Thorborg K, Roos EM, Bartels EM, Petersen J, Holmich P. Validity, reliability and responsiveness of patient-reported outcome questionnaires when assessing hip and groin disability: a systematic review. British Journal of Sports Medicine. 2010; 44(16):1186-1196. 28. Walters M. Reducing length of stay in total joint arthroplasty care. Orthop Clin North Am. 2016; 47(4):653-660. doi: 10.1016/j.ocl.2016.05.006. 29. White DK, Master H. Patient-reported measures of physical function in knee osteoarthritis. Rheum Dis Clin North Am.2016; 42(2):239-352. doi: 10.1016/j.rdc.2016.01.005. Complete Reference List: 1 Lyman S, Lee YY, Franklin PD, Li W, Mayman DJ, Padgett DE. (2016a). Validation of the HOOS, JR: A Short-form Hip Replacement Survey. Clinical Orthopaedics and Related Research®, 474(6):1472-1482. 2 Lyman S, Lee YY, Franklin PD, Li W, Cross MB, Padgett DE. (2016b). Validation of the KOOS, JR: A Short-form Knee Arthroplasty Outcomes Survey. Clinical Orthopaedics and Related Research®, 474(6):1461-1471. 3 American Academy of Orthopaedic Surgeons. 2015. Patient Reported Outcome Measures. Retrieved June 2, 2020, from https://www5.aaos.org/CustomTemplates/landingPage.aspx?id=4294968282&ssopc=1 . 4 Barber CEH, Zell J, Yazdany J, et al. 2019 American College of Rheumatology Recommended Patient-Reported Functional Status Assessment Measures in Rheumatoid Arthritis. Arthritis Care Res (Hoboken). 2019;71(12):1531-1539. doi:10.1002/acr.24040. 5 Committee on Quality Health Care in America, Institute of Medicine (IOM). Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, D.C.: National Academy Press; 2001: http://books.nap.edu/openbook.php?record_id=10027&page=R1 Accessed 2013. 6 Priorities of the National Quality Strategy. Content last reviewed September 2018. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/nhqdr15/priorities.html 7 Alviar M, Olver J, Brand C, Hale T, Khan F. Do Patient-Reported Outcome Measures Used in Assessing Outcomes in Rehabilitation After Hip and Knee Arthroplasty Capture Issues Relevant to Patients? Results of a Systematic Review and ICF Linking

MUC ID	Measure Title	Rationale
MUC20-0003 (cont'd)	Hospital-Level, Risk-Standardized Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA)	Process. J Rehabil Med. 2011; 43:374-381. [a]. 8 Alviar M, Olver J, Brand C, et al. Do Patient-Reported Outcome Measures in Hip and Knee Arthroplasty Rehabilitation Have Robust Measurement Attributes? A Systematic Review. J Rehabil Med. 2011; 43:572-583. [b]. 9 Bauman S, Williams D, Petruccelli D, Elliott W, de Beer J. Physical Activity After Total Joint Replacement: A Cross-Sectional Survey. Clin J Sport Med. 2007; 17(2):104-108. 10 Brown K, Topp R, Brosky JA, Lajoie AS. Prehabilitation and quality of life three months after total knee arthroplasty: a pilot study. Percept Mot Skills. Dec 2012; 115(3):765-774. 11 Choong PF, Dowsey MM, Stoney JD. Does accurate anatomical alignment result in better function and quality of life? Comparing conventional and computer-assisted total knee arthroplasty. J Arthroplasty. Jun 2009; 24(4):560-569. 12 Collins NJ, Roos EM. Patient-reported outcomes for total hip and knee arthroplasty: commonly used instruments and attributes of a "good" measure. Clin Geriatr Med. 2012; 28(3):367-394. 13 Feng JE, Novikov D, Anoushiravanni AA, Schwarzkopf R. Total knee arthroplasty: Improving outcomes with a multidisciplinary approach. J Multidiscip Healthc. 2018; 11:63-73. doi: 10.2147/JMDH.S140550. 14 Galea MP, Levinger P, Lythgo N, et al. A targeted home-and center-based exercise program for people after total hip replacement: a randomized clinical trial. Arch Phys Med Rehabil. Aug 2008; 89(8):1442-1447. 15 Jones CA, Beaupre LA, Johnston DW, Suarez-Almazor ME. Total joint arthroplasties: current concepts of patient outcomes after surgery. Rheum Dis Clin North Am. 2007; 33(1):71-86. 16 Jones CA, Pohar S. Health-related quality of life after total joint arthroplasty: a scoping review. Clin Geriatr Med. 2012; 28(3):395-429. 17 Kim KY. Perioperative orthopedic surgical home: Optimizing total joint arthroplasty candidates and preventing readmission. J Arthroplasty. 2019; 34(7s):S91-S96. doi: 10.1016/j/arth.2019.01.020. 18 Lau RL, Gandhi R, Mahomed S, Mahomed N. Patient satisfaction after total knee and hip arthroplasty. Clin Geriatr Med. 2012; 28(3):349-365. 19 Liebs TR. Quality-adjusted life years gained by hip and knee replacement surgery and its aftercare. Arch Physical Med Rehabil. 2016; 97(5):691-700. doi: 10.1016/j.apmr.2015.12.021. 20 McGregor AH, Rylands H, Owen A, Dore CJ, Hughes SP. Does preoperative hip rehabilitation advice improve recovery and patient satisfaction? J Arthroplasty. Jun 2004; 19(4):464-468. 21 Moffet H, Collet JP, Shapiro SH, Paradis G, Marquis F, Roy L. Effectiveness of intensive rehabilitation on functional ability and quality of life after first total knee arthroplasty: A single-blind randomized controlled trial. Arch Phys Med Rehabil. Apr 2004; 85(4):546-556. 22 Monticone M, Ferrante S, Rocca B, et al. Home-based functional exercises aimed at managing kinesiophobia contribute to improving disability and quality of life of patients undergoing total knee arthroplasty: a randomized controlled trial. Arch Phys Med Rehabil. Feb 2013; 94(2):231-239. 23 Montin L, Leino-Kilpi H, Suominen T, Lepisto J. A systematic review of empirical studies between 1966 and 2005 of patient outcomes of total hip arthroplasty and related factors. J Clin Nurs. 2008; 17(1):40-45. 24 Papalia R, Del Buono A, Zampogna B, Maffulli N, Denaro V. Sport activity following joint arthroplasty: a systematic review. Br Med Bull. 2012; 101:81-103. 25 Rolfson O, Rothwell A, Sedrakyan A, et al. Use of patient-reported outcomes in the context of different levels of data. J Bone Joint Surg Am. 2011; 3:66-71. 26 Saufl N, Owens A, Kelly I, Merrill B, Freyaldenhouen L. A multidisciplinary approach to total joint replacement. J Perianesth Nurs. 2007; 22(3):195-206.e9. 27 Thorborg K, Roos EM, Bartels EM, Petersen J, Holmich P. Validity, reliability and responsiveness of patient-reported outcome questionnaires when

MUC ID	Measure Title	Rationale
MUC20-0003 (cont'd)	Hospital-Level, Risk-Standardized Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA)	assessing hip and groin disability: a systematic review. British Journal of Sports Medicine. 2010; 44(16):1186-1196. 28 Walters M. Reducing length of stay in total joint arthroplasty care. Orthop Clin NorthAm. 2016; 47(4):653-660. doi: 10.1016/j.ocl.2016.05.006. 29 White DK, Master H. Patient-reported measures of physical function in knee osteoarthritis. Rheum Dis Clin North Am.2016; 42(2):239-352. doi: 10.1016/j.rdc.2016.01.005. 30 Adams J, Mehrota, A, Thoman J, McGlynn, E. (2010). Physician cost profiling – reliability and risk of misclassification. NEJM, 362(11): 1014-1021. 31 Steiner DL, Norman GR. (2003). Health Measurement Scales: A Practical Guide to Their Development and Use. London, UK: Oxford University Press. 32 Yu H, Mehrota A, Adams J. (2013). Reliability of utilization measures for primary care physician profiling. Healthcare, 1:22-29.
MUC20-0004	Appropriate Treatment for ST-Segment Elevation Myocardial Infarction (STEMI) Patients in the Emergency Department (ED)	Studies have shown that delays in the treatment of acute myocardial infarction (AMI) leads to increased risk of in-hospital mortality and morbidity, with nearly two lives per 1,000 patients lost per hour of delay in treatment (Sohlpour & Yusuf, 2014; Fibrinolytic Therapy Trialists' Collaborative Group, 1994). For the fibrinolytic therapy treatment arm, the American Heart Association (AHA) estimates that 65 lives will be saved per 1,000 patients if treatment is administered within the first hour of symptom onset, and 131 lives will be saved per 1,000 patients treated if fibrinolytic therapy is delivered within the first three hours (O'Connor et al., 2010). The total ischemic time—that is, the time from onset of STEMI symptoms to the initiation of some form of reperfusion therapy—is the principal determinant of health outcomes for patients with an AMI, so timely care is essential to minimize effects of disease morbidity and reduce mortality for this population. Primary PCI is the preferred treatment approach, with guidelines recommending initiation of PCI within 120 minutes from first medical contact (O'Gara et al., 2013). In situations where it is unlikely or impossible for a patient to receive primary PCI within the 120-minute timeframe, fibrinolytic therapy may be used for reperfusion and should be rapidly administered to reduce mortality and minimize morbidity; guidelines recommend that fibrinolytic therapy administration occur within 30 minutes of hospital arrival; this may also require rapid transfer for PCI (O'Gara et al., 2013). References: O'Connor RE, Brady W, Brooks SC, Diercks D, Egan J, Ghaemmaghami C, Menon V, O'Neil BJ, Travers AH, Yannapoulos D. (2010) Part 10: Acute coronary syndromes: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation, 122(suppl 3): S787-S817. DOI: 10.1161/CIRCULATIONAHA.110.971028. O'Gara P, Kushner F, Ascheim D, Casey D, Chung M, de Lemos J, Ettinger S, Fang J, Fesmire F, Franklin B, Granger C, Krumholz H, Linderbaum J, Morrow D, Newby L, Ornato J, Ou N, Radford M, Tamis-Holland J, Tommaso C, Tracy C, Woo Y, Zhao D, Anderson J, Jacobs A, Halperin J, Albert N, Brindis R, Creager M, DeMets D, Guyton R, Hochman J, Kovacs R, Kushner F, Ohman E, Stevenson W, Yancy C. (2013). 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation, 127(4): e362-425. Available at https://www.ncbi.nlm.nih.gov/pubmed/23247304 .

MUC ID	Measure Title	Rationale
MUC20-0005	Breast Screening Recall Rates	From the perspective of both clinical quality and efficiency, there are potentially negative consequences if the mammography and DBT recall rate is either too high or too low. A high cumulative dose of low-energy radiation can be a consequence of too many false-positive mammography and DBT recall studies. Radiation received from mammography or DBT may induce more cancers in younger women or those carrying deleterious gene mutations, such as BRCA-1 and BRCA-2. Additional imaging and biopsies after a screening mammography or DBT can also result in over-diagnosis among patients who do not have breast cancer, increasing their anxiety and distress. Alternatively, inappropriately low recall rates may lead to delayed diagnoses or undetected cases of breast cancer (Oregon Health & Science University 2009). Inclusion of DBT when evaluating recall care may improve recall rates and positive prediction values compared to metrics that focus on mammography (Aase et al. [2019]; Aujero et al. [2017]; Bian et al. [2016]; Caumo et al. [2018]; Conant et al. [2016]; Pattacini et al. [2018]; Pozz et al. [2016]; and Skaane [2017]). REFERENCES 1. Oregon Health & Science University. Screening for Breast Cancer: Systematic Evidence Review Update for the U. S. Preventive Services Task Force. Prepared For: Agency for Healthcare Research and Quality U.S. Department of Health and Human Services. Portland, OR: Oregon Health & Science University, 2009. 2. D'Orsi CJ, Sickles EA, Mendelson EB, Morris EA, et al. ACR BI-RADS® Atlas, Breast Imaging Reporting and Data System. Reston, VA: American College of Radiology, 2013. 3. Aase, H. S., Holen, A. S., Pedersen, K., Houssami, N., Haldorsen, I. S., Sebuodegard, S., Hofvind, S. (2019). A randomized controlled trial of digital breast tomosynthesis versus digital mammography in population-based screening in Bergen: interim analysis of performance indicators from the To-Be trial. 29(3), 1175-1186. doi: 10.1007/s00330-018-5690-x. 4. Aujero, M. P., Gavenonis, S. C., Benjamin, R., Zhang, Z., & Holt, J. S. (2017). Clinical Performance of Synthesized Two-dimensional Mammography Combined with Tomosynthesis in a Large Screening Population. Radiology, 283(1), 70-76. doi: 10.1148/radiol.2017162674. 5. Bian, T., Lin, Q., Cui, C., Li, L., Qi, C., Fei, J., & Su, X. (2016). Digital Breast Tomosynthesis: A New Diagnostic Method for Mass-Like Lesions in Dense Breasts. Breast J, 22(5), 535-540. doi: 10.1111/tbj.12622. 6. Caumo F, Zorzi M, Brunelli S, et al. Digital Breast Tomosynthesis with Synthesized Two-Dimensional Images versus Full-Field Digital Mammography for Population Screening: Outcomes from the Verona Screening Program. Radiology. 2018;287(1):37-46. 7. Conant, E. F., Beaber, E. F., Sprague, B. L., Herschorn, S. D., Weaver, D. L., Onega, T., . . . Barlow, W. E. (2016). Breast cancer screening using tomosynthesis in combination with digital mammography compared to digital mammography alone: a cohort study within the PROSPR consortium. Breast Cancer Res Treat, 156(1), 109-116. doi: 10.1007/s10549-016-3695-1. 8. Pattacini, P., Nitrosi, A., & Giorgi Rossi, P. (2018). Digital Mammography versus Digital Mammography Plus Tomosynthesis for Breast Cancer Screening: The Reggio Emilia Tomosynthesis Randomized Trial. 288(2), 375-385. doi: 10.1148/radiol.2018172119. 9. Pozz, A., Corte, A. D., Lakis, M. A., & Jeong, H. (2016). Digital Breast Tomosynthesis in Addition to Conventional 2DMammography Reduces Recall Rates and is Cost Effective. Asian Pac J Cancer Prev, 17(7), 3521-3526. 10. Skaane, P. (2017). Breast cancer screening with digital breast tomosynthesis. Breast Cancer, 24(1), 32-41. doi: 10.1007/s12282-016-0699-y.

MUC20-0015	Asthma/Chronic Obstructive Pulmonary Disease (COPD) Episode-Based Cost Measure	Research has shown that both asthma and COPD are highly prevalent, costly conditions within the US population, and their overall disease burden and financial impact continue to rise. [1, 2] COPD is the third leading cause of death in the United States.[3] In 2014, 15.7 million Americans were diagnosed with COPD, yet this number could be an underestimation since many people with low lung function are not aware they have COPD.[4] The Centers for Disease Control and Prevention estimated that COPD-related costs grew by nearly $17 billion in the past decade in the United States, equating to an overall increase of 53 percent. [5, 6] Specifically, Medicare paid 51 percent of these COPD-related costs. [7] One study found that the mean total health care costs were $20,500 higher among Medicare patients with COPD compared to those without COPD. [8] Among the many factors that contribute to rising health care costs associated with COPD, increasing hospitalization and readmission rates are among the highest cost drivers. [9] COPD is the fourth leading cause of 30-day readmissions, where nearly one-fifth of patients hospitalized for an acute exacerbation of COPD were readmitted within 30 days of discharge. [10, 11, 12] More than 25 million Americans live with asthma, [13] and it has been estimated that five percent of all Medicare patients have an asthma diagnosis. [14] The total cost incurred for treatment of asthma was $81.9 billion in 2013. [15] Recent estimates attribute more than 10 million lost work days among employed adults and nearly two million emergency department visits over one year to asthma. [16] Much like COPD, the burden of asthma falls heavily on adults aged 65 years and older, who have the highest mortality rate for the condition compared to any other age group. Despite the differences in etiology, symptoms, and responses to therapy between asthma and COPD, these diseases overlap in disease presentation and pathophysiologic characteristics. [17, 18] There is also a substantial 15 to 20 percent overlap in the reported prevalence of comorbid cases of asthma and COPD. [19] This overlapping relationship places an important role on clinicians to follow appropriate guidelines and utilize proper management strategies to classify and treat patients accurately. [20] Given the high impact in terms of patient population and Medicare spending, the Asthma/COPD measure represents an opportunity for improvement on overall cost performance. References: [1] Centers for Disease Control and Prevention. "Basics About COPD." https://www.cdc.gov/copd/basics-about.html . [2] Asthma and Allergy Foundation of America. "Cost of Asthma on Society." https://www.aafa.org/cost-of-asthma-on-society/ . [3] American Lung Association. "How Serious Is COPD." https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/learn-about-copd/how-serious-is-copd.html . [4] Centers for Disease Control and Prevention. "Basics About COPD." https://www.cdc.gov/copd/basics-about.html . [5] Ford, Earl S., Louise B. Murphy, Olga Khavjou, Wayne H. Giles, James B. Holt, and Janet B. Croft. "Total and State-Specific Medical and Absenteeism Costs of COPD among Adults Aged 18 Years in the United States for 2010 and Projections Through 2020." CHEST 147, no. 1 (2015): 31-45. [6] Centers for Disease Control and Prevention. "COPD Costs." https://www.cdc.gov/copd/infographics/copd-costs.html . [7] Ibid. [8] Menzin, Joseph, Luke Boulanger, Jeno Marton, Lisa Guadagno, Homa Dastani, Riad Dirani, Amy Phillips, and Hemal Shah. "The Economic Burden of Chronic Obstructive Pulmonary Disease (COPD) in a U.S. Medicare Population." Respiratory Medicine 102, no. 9 (2008): 1248-56. [9] Parikh, Raj, Trushil G. Shah, and Rajive Tandon. "COPD Exacerbation Care Bundle Improves Standard of Care, Length of Stay, and Readmission Rates." International Journal of Chronic

MUC ID	Measure Title	Rationale
MUC20-0015 (cont'd)	Asthma/Chronic Obstructive Pulmonary Disease (COPD) Episode-Based Cost Measure	Obstructive Pulmonary Disease 11 (2016): 577-83. [10] Ibid. [11] Jencks, Stephen F., Mark V. Williams, and Eric A. Coleman. "Rehospitalizations Among Patients in the Medicare Fee-for-Service Program." The New England Journal of Medicine 360, no. 14 (2009): 1418-28. [12] Ibid. [13] Asthma and Allergy Foundation of America. "Asthma Facts and Figures." https://www.aafa.org/asthma-facts/ . [14] Centers for Medicare & Medicaid Services. "Health Disparities in the Medicare Population: Asthma." https://www.cms.gov/files/document/2016-05-cms-omh-data-snapshot-asthma-508pdf . [15] Nurmagambetov, Tursynbek, Robin Kuwahara, and Paul Garbe. "The Economic Burden of Asthma in the United States, 2008–2013." Annals of the American Thoracic Society 15, no. 3 (2018): 348-56. [16] American Lung Association. "Asthma in Adults Fact Sheet." https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/learn-about-asthma/asthma-adults-facts-sheet.html . [17] Guarascio, Anthony J., Shauntá M. Ray, Christopher K. Finch, and Timothy H. Self. "The Clinical and Economic Burden of Chronic Obstructive Pulmonary Disease in the USA." ClinicoEconomics and Outcomes Research 5 (2013): 235-45. [18] Cukic, Vesna, Vladimir Lovre, Dejan Dragisic, and Aida Ustamujic. "Asthma and Chronic Obstructive Pulmonary Disease (COPD) - Differences and Similarities." Materia Socio-Medica 24, no. 2 (2012): 100-05. [19] Global Initiative for Chronic Obstructive Lung Disease. "Diagnosis of Diseases of Chronic Airflow Limitation: Asthma, COPD, and Asthma-Copd Overlap Syndrome (ACOS)." https://goldcopd.org/wp-content/uploads/2016/04/GOLD_ACOS_2015.pdf . [20] Guarascio, Anthony J., Shauntá M. Ray, Christopher K. Finch, and Timothy H. Self. "The Clinical and Economic Burden of Chronic Obstructive Pulmonary Disease in the USA." ClinicoEconomics and Outcomes Research 5 (2013): 235-45.
MUC20-0016	Colon and Rectal Resection Episode-Based Cost Measure	Colorectal resection, or colectomy, is a common treatment for colorectal cancer and complications related to diverticular disease. According to the Agency for Healthcare Research and Quality, about 320,000 colorectal resection procedures were performed annually between 2001 and 2011. [1] Colorectal cancer is the second leading cause of cancer-related deaths and the third most common cancer in both men and women in the United States. Colorectal cancer is especially common in the 85 and older adult population, with an incidence of 237 per 100,000 persons in 2016. [2] Similarly, diverticular disease primarily affects older adults, occurring in 50-70% of those aged 80 or older. Diverticular disease accounts for more than $2 billion in treatment costs annually. While diverticular disease is usually an asymptomatic condition, the incidence of complications such as colonic diverticulitis increases with age. [3, 4] Morbidity and the risk of postoperative complications following colorectal resection also increase significantly for patients above age 65. [5] According to the literature, a single colectomy is estimated to cost $25,000, and this cost can increase to nearly $50,000 with post-operative complications. [6, 7] Estimates of index hospitalization costs for colorectal surgery are similar and have been shown to range between about $18,000 to $21,000 among a cohort of Medicare beneficiaries, with variation in the cost of care provided within a year of the surgery largely driven by readmissions and post-acute care utilization. [8] Given the costs and frequency of treating colorectal cancer and complications related to diverticular disease with colectomy procedures in Medicare beneficiaries, the Colon and Rectal Resection cost measure represents an opportunity for improvement on overall cost performance. References: [1] Audrey J Weiss and Anne Elixhauser, Trends in Operating Room

MUC ID	Measure Title	Rationale
MUC20-0016 (cont'd)	Colon and Rectal Resection Episode-Based Cost Measure	Procedures in U.S. Hospitals, 2001–2011: Statistical Brief #171, Healthcare Cost and Utilization Project (HCUP) Statistical Briefs (Rockville, MD: Agency for Healthcare Research and Quality, 2014), http://www.ncbi.nlm.nih.gov/pubmed/24851286 ; Samuel Eisenstein, Sarah Stringfield, and Stefan D. Holubar, "Using the National Surgical Quality Improvement Project (NSQIP) to Perform Clinical Research in Colon and Rectal Surgery," Clinics in Colon and Rectal Surgery 32, no. 1 (2019): 41–53, https://doi.org/10.1055/s-0038-1673353 . [2] U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, "U.S. Cancer Statistics Data Visualizations Tool," n.d., https://gis.cdc.gov/Cancer/USCS/DataViz.html . [3] Chien Kuo Liu, Hsi Hsien Hsu, and She Meng Cheng, "Colonic Diverticulitis in the Elderly," International Journal of Gerontology (Elsevier (Singapore) Pte Ltd, March 1, 2009), https://doi.org/10.1016/S1873-9598(09)70015-8 . [4] Neda Valizadeh, Kunal Suradkar, and Ravi P Kiran, "Specific Factors Predict the Risk for Urgent and Emergent Colectomy in Patients Undergoing Surgery for Diverticulitis.," The American Surgeon 84, no. 11 (November 1, 2018): 1781–86, http://www.ncbi.nlm.nih.gov/pubmed/30747633 . [5] Mehraneh D. Jafari et al., "Colorectal Cancer Resections in the Aging US Population: A Trend toward Decreasing Rates and Improved Outcomes," JAMA Surgery (American Medical Association, June 1, 2014), https://doi.org/10.1001/jamasurg.2013.4930 . [6] Faiz Gani et al., "Bundled Payments for Surgical Colectomy among Medicare Enrollees: Potential Savings vs the Need for Further Reform," JAMA Surgery 151, no. 5 (May 1, 2016): e160202, https://doi.org/10.1001/jamasurg.2016.0202 . [7] David N Flynn et al., "The Impact of Complications Following Open Colectomy on Hospital Finances: A Retrospective Cohort Study," Perioperative Medicine 3, no. 1 (March 7, 2014): 1, https://doi.org/10.1186/2047-0525-3-1 . [8] Zaid M. Abdelsattar, John D. Birkmeyer, and Sandra L. Wong, "Variation in Medicare Payments for Colorectal Cancer Surgery," Journal of Oncology Practice 11, no. 5 (September 30, 2015): 391–95, https://doi.org/10.1200/jop.2015.004036 .
MUC20-0017	Diabetes Episode-Based Cost Measure	The high prevalence and cost of diabetes mellitus and its associated complications to the United States health care system warrants the exploration of potential cost measures which aim to achieve more cost-effective care for a given condition. In the United States, there are approximately 13.5 million people ages 65 and older living with diabetes, and treatment of diabetes in the United States costs over $348 billion annually. [1] In 2012, 59 percent of healthcare costs related to diabetes were associated with patients over the age of 65. [2] In 2017, approximately 57 percent ($9,600 out of $16,750) of annual medical expenditures incurred for patients diagnosed with diabetes were related to their diabetes diagnosis. [3] Additionally, on average, patients with diabetes had medical expenditures 2.3 times higher than those for patients without a diabetes diagnosis. Significant cost drivers in the care of diabetes are the occurrence of acute complications such as acute hyperglycemic crises (diabetic ketoacidosis and hyperglycemic hyperosmolar nonketotic syndrome) and longer-term complications of diabetes such as retinopathy, neuropathy, diabetic foot ulcers, cardiovascular events, renal disease, and amputations. [4] For example, over $2.4 billion in costs from hospital treatment were attributed to acute hyperglycemic crises, and over $1.84 billion for acute hypoglycemia and related injuries. [5, 6] Overall, patients with multiple diabetes complications had a higher

MUC ID	Measure Title	Rationale
MUC20-0017 (cont'd)	Diabetes Episode-Based Cost Measure	risk of readmissions for severe dysglycemia (hyperglycemia or hypoglycemia) as well as causes that are unrelated to diabetes. It was also estimated that the prevalence of diabetic retinopathy among diabetic patients 65 years and older was 29.5 percent. [7] Similarly, in 2007, 8.1 percent of Medicare diabetic beneficiaries enrolled in Medicare Parts A and B had diabetic foot ulcers, incurring spending that was significantly higher than that for beneficiaries without chronic wounds ($31,363 vs. $11,692, respectively). [8] Given the prevalence of diabetes in the Medicare population, and the high costs associated with the management of the disease and its complications, the Diabetes cost measure represents an opportunity for improvement on overall cost performance. References: [1] International Diabetes Federation, "IDF Diabetes Atlas - 8th Edition," https://diabetesatlas.org/en/resources/ . [2] Mousumi Sircar, Ashmeet Bhatia, and Medha Munshi, "Review of Hypoglycemia in the Older Adult: Clinical Implications and Management," Canadian Journal of Diabetes 40, no. 1 (February 2016): 66-72, https://doi.org/10.1016/j.jcjd.2015.10.004 . [3] American Diabetes Association, "Economic Costs of Diabetes in the U.S. in 2017," Diabetes Care 41, no. 5 (May 2018): 917–928, https://doi.org/10.2337/dci18-0007 . [4] Baxter et al., "Estimating the Impact of Better Management of Glycaemic Control in Adults with Type 1 and Type 2 Diabetes on the Number of Clinical Complications and the Associated Financial Benefit," Diabetic Medicine 33, no. 11 (January 2016): 1575-1581, https://doi.org/10.1111/dme.13062 . [5] Guillermo Umpierrez and Mary Korytkowski, "Diabetic Emergencies — Ketoacidosis, Hyperglycaemic Hyperosmolar State and Hypoglycaemia," Nature Reviews Endocrinology 12 (February 2016): 222-232, https://doi.org/10.1038/nrendo.2016.15 . [6] Zhao et al., "Economic Burden of Hypoglycemia: Utilization of Emergency Department and Outpatient Services in the United States (2005–2009)," Journal of Medical Economics 19, no. 9 (April 2016): 852-857, https://doi.org/10.1080/13696998.2016.1178126 . [7] Zhang et al., "Prevalence of Diabetic Retinopathy in the United States, 2005-2008," JAMA 304, no. 6 (August 2010): 649–656, https://doi.org/10.1001/jama.2010.1111 . [8] Zhang et al., "Prevalence of Diabetic Retinopathy in the United States, 2005-2008," JAMA 304, no. 6 (August 2010): 649–656, https://doi.org/10.1001/jama.2010.1111 .

MUC ID	Measure Title	Rationale
MUC20-0018	Melanoma Resection Episode-Based Cost Measure	In the US, the average age when melanoma is diagnosed is 65, with incidence and melanoma-specific mortality increasing with age and peaking in the Medicare-aged population [1]. Additionally, it is estimated that 196,060 cases of invasive and in situ melanoma will be newly diagnosed in 2020, with all melanoma cases costing the health care system an estimated $3.3 billion annually, a figure that is anticipated to continue to rise due to the increasing incidence of melanoma [2] (Skin Cancer Foundation). Opportunities for improvement for melanoma resection are primarily found within the variation in the timing of certain stages of post-excision treatment, procedure selection in context with patient characteristics to minimize complications, and adherence to established clinical excision margins. References: [1] "Skin Cancer Facts & Statistics: What You Need to Know" Skin Cancer Facts and Statistics. Skin Cancer Foundation. Accessed May 1, 2020. https://www.skincancer.org/skin-cancer-information/skin-cancer-facts/ . [2] Howlader N, Noone AM, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2016, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2016/ , based on November 2018 SEER data submission, posted to the SEER web site, April 2019.

MUC ID	Measure Title	Rationale
MUC20-0019	Sepsis Episode-Based Cost Measure	Sepsis represents a significant share of hospitalizations and Medicare cost. A recent study indicated that from 2012 to 2018, the annual number of Medicare Parts A and B (fee-for-service) beneficiaries with a sepsis hospitalization (defined as having a sepsis diagnosis) rose from around 800,000 to over 1.1 million; annual total cost for these hospitalizations rose from $17.8 billion to over $22.4 billion. [1] Additionally, the total cost of skilled nursing facility care in the 90 days after the sepsis hospitalization discharge rose from $3.9 billion to over $5.6 billion over that same interval. An earlier study using a 2013 sample estimated that sepsis hospitalizations represented over 8% of Medicare costs. [2] Hospitalizations with sepsis have an average length of stay that is greater than other conditions, and it is longer for cases of septic shock. [3] Sepsis hospitalizations also have a significant level of mortality. According to the Centers for Disease Control and Prevention, at least 1.7 million adults develop sepsis each year, and 1 in 3 patients who die in a hospital have sepsis (i.e., about 270,000 deaths annually). [4] A 2020 study found that the one-week, six-month, and one-year mortality rates for Medicare beneficiaries admitted for sepsis hospitalizations range from 7.2 – 40.6%, 26.5 – 60.1%, and 32.9 – 64.6%, respectively, based on severity. [5] Overall, hospital mortality rate is significantly higher for cases with septic shock. [6] Given the high cost associated with providing care for sepsis and frequent use of post-acute care services following sepsis hospitalizations, sepsis cost measurement provides an opportunity for improvement on overall cost performance. According to the 2020 study of 2012-2018 Medicare sepsis hospitalizations, the average hospital cost in 2018 ranged from about $16,000 to over $29,000, based on severity, with significantly higher cost for cases where sepsis is not present on admission. [7] There are also substantial downstream costs associated with sepsis; for example, patients hospitalized for sepsis are more likely to be discharged to either a short-term care facility or long-term care institution compared to patients hospitalized for other conditions. The 2020 study also found that, within 6 months of discharge, patients hospitalized for sepsis relative to patients hospitalized for other conditions had: (i) 22.6% fewer discharges to the home, (ii) a more than two-fold increase in mortality, and (iii) a larger share of patients in skilled nursing facilities (or other nursing care), hospice care, or readmitted to an inpatient hospital. [8] References: [1] T. G. Buchman et al., "Sepsis among Medicare Beneficiaries: 1. The Burdens of Sepsis, 2012-2018," Crit Care Med 48, no. 3 (Mar 2020). https://doi.org/10.1097/CCM.0000000000004224 . [2] AHRQ, "Hcup National Inpatient Sample (Nis): Healthcare Cost and Utilization Project (Hcup), 2013." [3] C. J. Paoli et al., "Epidemiology and Costs of Sepsis in the United States-an Analysis Based on Timing of Diagnosis and Severity Level," Crit Care Med 46, no. 12 (Dec 2018). https://doi.org/10.1097/CCM.0000000000003342 ; M. J. Hall et al., "Inpatient Care for Septicemia or Sepsis: A Challenge for Patients and Hospitals," NCHS Data Brief, no. 62 (Jun 2011). [4] "Data & Reports," 2016, accessed June 19, 2019, 2019, https://www.cdc.gov/sepsis/datareports/index.html . [5] T. G. Buchman et al., "Sepsis among Medicare Beneficiaries: 2. The Trajectories of Sepsis, 2012-2018," Crit Care Med 48, no. 3 (Mar 2020). https://doi.org/10.1097/CCM.0000000000004226 . [5] Buchman et al. [6] Paoli et al. [7] Buchman et al. [8] T. G. Buchman et al., "Sepsis among Medicare Beneficiaries: 2. The Trajectories of Sepsis, 2012-2018," Crit Care Med 48, no. 3 (Mar 2020). https://doi.org/10.1097/CCM.0000000000004226 .

MUC ID	Measure Title	Rationale
MUC20-0030	Hospice Care Index	The 10 individual indicators included in the index were selected for their relation to five domains which had been highlighted as reflective of care provided by the multi-disciplined staff and demonstrate care provided throughout the hospice stay. These are also areas raised by the Office of Inspector General (OIG), MedPAC, or academic literature as needing improvement. The index examines these domains, described below, in totality to support examination of the hospice philosophy's holistic intent (described in Row 19, above). Hospice leaders, national hospice organizations, and CMS all support and espouse this intent, and the Hospice Care Index was developed to further support the measurement of this philosophy. The 10 indicators measure programs' care processes and service provision, or suggest programs selectively enrolling patients who are expected to result in lower costs and longer elections. While many hospice programs would be expected may to exhibit 'some' degree of all indicators, the index identifies the number of instances hospice providers exceed thresholds across multiple indicators simultaneously; hence the totality concept of this index. The domains, rationales, and supporting studies, and representative indicators are as follows: 1. Provision of General Inpatient (GIP) and Continuous Home Care (CHC) days. Medicare Hospice Conditions of Participation require hospices to be able to provide both CHC and GIP level of care to manage more intense symptom crises. However, a 2013 OIG report found that 953 hospice programs did not provide any GIP level of care services, and it was unclear if dying patients at such hospices were receiving appropriate management of symptoms when in crisis (a similar concern exists for hospice services at the CHC level). Thus, the index includes an indicator of hospice programs that do not provide any GIP nor CHC service days. 2. Provision of Visits by Professional Hospice Staff. Conditions of Participation require a member of the interdisciplinary team to ensure ongoing assessment of patient and caregiver needs and the implementation of the plan of care. To assess the receipt of adequate oversight, one indicator examines hospices that have a high rate of patients who are not seen at least once a week by nursing staff. Another indicator examines the average number of minutes per day that nursing staff provide during Routine Home Care (RHC) service. To assess 24/7 availability of hospice services as required by the Conditions of Participation, this index includes minutes of care provided by skilled nurses on weekend RHC days. Finally, the end of life is typically the period in the terminal illness trajectory with the highest symptom burden. Particularly during the last few days before death, patients (and caregivers) experience many physical and emotional symptoms, necessitating close care and attention from the integrated hospice team and drawing increasingly on hospice team resources (de la Cruz 2014, Dellon 2010, Kehl 2013). Highly specific physical signs associated with death can often be identified within 3 days of death (Hui et al., 2014). Therefore, the index includes an indicator capturing staff visits during the three days prior to the beneficiary's death. 3. Rate and Patterns of Hospice Live Discharges. Prior work has identified various problematic patterns of live discharge from hospice. High rates for these patterns suggest problems in hospices' care processes, their advance care planning to prevent hospitalizations, or their discharge processes (Teno et al., 2015). As MedPAC (2020) notes, "Hospice providers are expected to have some rate of live discharges because some patients change their mind about using the hospice benefit and dis-enroll from hospice or their condition improves and they no longer meet the hospice eligibility criteria. However, providers with substantially

MUC ID	Measure Title	Rationale
MUC20-0030 (cont'd)	Hospice Care Index	higher rates of live discharge than their peers could signal a potential problem with quality of care or program integrity. An unusually high rate of live discharges could indicate that a hospice provider is not meeting the needs of patients and families or is admitting patients who do not meet the eligibility criteria." Our indicators of live discharge, like MedPAC's, include discharges for all reasons, including both that the patient was no longer found terminally ill and for revocations due to the patient's choice; in the same (2020) report, MedPAC wrote "Some stakeholders argue that live discharges initiated by the beneficiary—such as when the beneficiary revokes his or her hospice enrollment—should not be included in a live-discharge measure because, some stakeholders assert, these discharges reflect beneficiary preferences and are not in the hospice's control. Because beneficiaries may choose to revoke hospice for a variety of reasons, which in some cases are related to the hospice provider's business practices or quality of care, we include revocations in our analysis". The index includes four indicators that capture these patterns: the rates of (i) live discharge within 7 days of hospice enrollment; (ii) live discharge that occurred 180 days or more after hospice enrollment; (iii) hospice live discharge with a hospital admission, and then hospice readmission; and (iv) hospice live discharge followed by a hospital admission with the patient's death in the hospital. 4. Per-beneficiary spending. Estimates of per-beneficiary spending are endorsed by NQF (#2158) and publicly reported by CMS for other care settings. Because the Medicare hospice benefit pays a per diem rate, an important determinant of per-beneficiary spending is the length of election. MedPAC reported that nearly half of Medicare hospice expenditures are for patients that have had at least 180 or more days on hospice (MedPAC, 2020), and expressed a concern that some programs do not appropriately discharge patients whose medical condition makes them no longer eligible for hospice services, or, that that hospices selectively enroll patients with non-cancer diagnoses and longer predicted lengths of stay in hospice. The other determinant of per-beneficiary spending is the level of care at which services are billed, and in a 2016 report the OIG has expressed concern at the potentially inappropriate billing of high-level, higher-rate services such as General Inpatient (GIP) care. For these reasons the index includes one indicator for per-beneficiary spending, calculated as the total amount of spending paid to a hospice in a year divided by the total number of beneficiaries served by the hospice. References: Department of Health and Human Services, Office of Inspector General. (2013). Medicare hospice: Use of general inpatient care. https://oig.hhs.gov/oei/reports/oei-02-10-00490.asp . Department of Health and Human Services, Office of Inspector General. (2016). Medicare hospice: Hospices Inappropriately Billed Medicare Over $250 Million for General Inpatient Care. https://oig.hhs.gov/oei/reports/oei-02-10-00491.asp . Medicare Payment Advisory Commission. 2020. Report to the Congress: Medicare payment policy. Washington, DC: MedPAC. Medicare and Medicaid Programs: Hospice Conditions of Participation, 42 CFR 418. https://www.federalregister.gov/d/08-1305 . Teno J. M., Bowman, J., Plotzke, M., Gozalo, P. L., Christian, T., Miller, S. C., Williams, C., & Mor, V. (2015). Characteristics of hospice programs with problematic live discharges. Journal of Pain and Symptom Management, 50, 548-552. doi: 10.1016/j.jpainsymman.2015.05.001. de la Cruz, M., et al. (2015). Delirium, agitation, and symptom distress within the final seven days of life among cancer patients receiving hospice care. Palliative & Supportive

MUC ID	Measure Title	Rationale
MUC20-0030 (cont'd)	Hospice Care Index	Care, 13(2): 211-216. doi: 10.1017/S1478951513001144. Dellon, E. P., et al. (2010). Family caregiver perspectives on symptoms and treatments for patients dying from complications of cystic fibrosis. Journal of Pain & Symptom Management, 40(6): 829-837. doi: 10.1016/j.jpainsymman.2010.03.024. Kehl, K. A., et al. (2013). A systematic review of the prevalence of signs of impending death and symptoms in the last 2 weeks of life. American Journal of Hospice & Palliative Care, 30(6): 601-616. doi: 10.1177/1049909112468222. Hui D et al. (2014). Clinical Signs of Impending Death in Cancer Patients. The Oncologist. 19(6):681-687. doi:10.1634/theoncologist.2013-0457.
MUC20-0032	Global Malnutrition Composite Score	Nationwide analysis of hospitalizations with malnutrition diagnoses concluded that 8% of all non-neonatal and non-maternal adult hospitalizations were coded for a diagnosis of malnutrition. Furthermore, malnourished patients experienced up to 5x risk of in-hospital mortality, up to 2x higher hospital costs, up to 2x longer length of stay, and 55% higher readmissions than discharges without malnutrition. (Barrett, 2018). Recently published research suggests that adopting malnutrition standards of care is a feasible and valuable endeavor for hospitals to undertake. Multiple studies have shown that optimal malnutrition care quality improvement programs improve care coordination between clinical disciplines responsible for nutrition care and that those improvements are associated with outcomes (Valladares, 2020; Danis, 2019; Nepple, 2019; Sriram, 2018). A cost evaluation was conducted on one of the quality improvement programs, savings in terms of avoided hospital readmissions and reduced patient length of stay for patients in the quality improvement program totaled up to $4.8 million (Sulo, 2017). Clinical evidence and best practices support the need for quality measures that incentivize early identification, diagnosis, intervention, and effective transitions of care for hospitalized patients who are at-risk or malnourished (McCauley, 2019). Malnutrition risk identified in patients through a malnutrition screening was able to predict certain patient outcomes including length of stay, mortality, and post-operative complications. (Sauer, 2019; Silver, 2018; Allard, 2016; Khalatbari-Soltani, 2016; Kruizenga, 2016; Agarwal, 2013). A large national study understanding inpatient data from US hospitals, demonstrated that as many as 1 in 3 hospitalized patients are at-risk of malnutrition according to validated screening (Sauer, 2019). The peer reviewed evidence cited for this measure also supports the assessment of patients at-risk of malnutrition via the completion of a nutrition assessment that can confirm malnutrition and initiate a care plan recommending appropriate interventions (Hudson, 2018). Multiple studies have reported patient outcomes associated with malnutrition when identified by nutrition assessment, was independently associated with higher hospital mortality, higher incidence of infection, and an increased risk of readmission (Hiller, 2017; Lew, 2016). Additionally, a recently published study demonstrated that malnourished patients were older (61 vs 58 years, P < .0001), had longer LOS (15 vs 12 days, P = .0067) and were more likely to be readmitted within 30 days (40% vs 23%, P < .0001). In adjusted models, 30-day readmissions (odds ratio [OR] 2.13, 95% confidence interval [CI] 1.82-2.48) and hospital mortality (OR 1.47, 95% CI 1.0-1.99) were increased in those who had >2-day stay (Hudson, 2018). Two research studies associated early nutritional care after risk identification with improved outcomes such as reduced length of stay, reduction in risk of readmissions, and cost of care (Lew, 2016), (Meehan, 2016). An additional study of a learning collaborative of US hospitals

MUC ID	Measure Title	Rationale
MUC20-0032 (cont'd)	Global Malnutrition Composite Score	demonstrated a statistically significant lower risk of 30-day readmission for malnourished patients who had a documented nutrition care plan (Valladares, 2020). Nutritional status and progress are often not adequately documented in the medical record. It can be difficult to tell when (or if) patients are consuming food and supplements. In addition, nutritional procedures and EHR-triggered care are often lacking in the hospital. Similarly, nutritional care plans and patient issues are poorly communicated to post-acute facilities and PCPs (Corkins, 2014). Additionally, room to improve coordination between registered dietitians and physicians has also been reported (Chambers, 2019; Vest, 2018). Finally, documentation of malnutrition diagnoses has been associated with significant healthcare cost savings per hospital day per patient (Amaral, 2007). REFERENCES: Agarwal E, Ferguson M, Banks M, et al. Malnutrition and poor food intake are associated with prolonged hospital stay, frequent readmissions, and greater in-hospital mortality: results from the Nutrition Care Day Survey 2010. Clinical nutrition (Edinburgh, Scotland). 2013;32(5):737-745. Allard JP, Keller H, Teterina A, et al. Lower handgrip strength at discharge from acute care hospitals is associated with 30-day readmission: A prospective cohort study. Clinical nutrition (Edinburgh, Scotland). 2016;35(6):1535-1542. Amaral TF, Matos LC, Tavares MM, Subtil A, Martins R, Nazaré M, et al. The economic impact of disease-related malnutrition at hospital admission. Clin Nutr. 2007 Dec;26(6):778–84. Barrett ML, Bailey MK, Owens PL. Non-maternal and Non-neonatal Inpatient Stays in the United States Involving Malnutrition, 2016. ONLINE. August 30, 2018. U.S. Agency for Healthcare Research and Quality. Available: https://www.hcup-us.ahrq.gov/reports/HCUPMalnutritionHospReport_083018.pdf . Chambers R, Bryan J, Jannat-khah D, Russo E, Merriman L, Gupta R. Evaluating Gaps in Care of Malnourished Patients on General Medicine Floors in an Acute Care Setting. Nutr Clin Pract. 2019;34(2):313-318. Corkins MR, Guenter P, Dimaria-ghalili RA, et al. Malnutrition diagnoses in hospitalized patients: United States, 2010. J Parenter Enteral Nutr. 2014;38(2):186-95. Danis K, Kline M, Munson M, et al. Identifying and Managing Malnourished Hospitalized Patients Utilizing the Malnutrition Quality Improvement Initiative: The UPMC Experience. J Acad Nutr Diet. 2019;119(9 Suppl 2):S40-S43. Hiller LD, Shaw RF, Fabri PJ. Difference in Composite End Point of Readmission and Death Between Malnourished and Nonmalnourished Veterans Assessed Using Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition Clinical Characteristics. JPEN J Parenter Enteral Nutr. 2017;41(8):1316-1324. Hudson L, Chittams J, Griffith C, Compher C. Malnutrition Identified by Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition Is Associated With More 30-Day Readmissions, Greater Hospital Mortality, and Longer Hospital Stays: A Retrospective Analysis of Nutrition Assessment Data in a Major Medical Center. JPEN J Parenter Enteral Nutr. 2018. Khalatbari-Soltani S, Marques-Vidal P. Impact of nutritional risk screening in hospitalized patients on management, outcome and costs: A retrospective study. Clinical nutrition (Edinburgh, Scotland). 2016;35(6):1340-1346. Kruizenga H, van Keeken S, Weijs P, et al. Undernutrition screening survey in 564,063 patients: patients with a positive undernutrition screening score stay in hospital 1.4 d longer. The American journal of clinical nutrition. 2016;103(4):1026-1032. Lew CC, Yandell R, Fraser RJ, Chua AP, Chong MF, Miller M. Association Between Malnutrition and Clinical Outcomes in the Intensive Care Unit: A Systematic Review. JPEN. Journal of parenteral and enteral nutrition. 2016. McCauley SM, Mitchell K & Heap A. The

MUC ID	Measure Title	Rationale
MUC20-0032 (cont'd)	Global Malnutrition Composite Score	Malnutrition Quality Improvement Initiative: A Multiyear Partnership Transforms Care. J Acad Nutr Diet. 2009;119(9 Suppl 2):S18-S24. Meehan A, Loose C, Bell J, Partridge J, Nelson J, Goates S. Health System Quality Improvement: Impact of Prompt Nutrition Care on Patient Outcomes and Health Care Costs. J Nurs Care Qual. 2016. Nepple K, Tobert C, Valladares A, Mitchell K, Yadrick M. Enhancing identification and management of hospitalized patients who are malnourished: a pilot evaluation of electronic quality improvement measures. J Acad Nutr Diet. 2019;119(9S2):S32-S39. Sauer AC, Goates S, Malone A, et al. Prevalence of Malnutrition Risk and the Impact of Nutrition Risk on Hospital Outcomes: Results From nutrition Day in the U.S. JPEN J Parenter Enteral Nutr. 2019;43(7):918-926. Silver HJ, Pratt KJ, Bruno M, Lynch J, Mitchell K, Mccauley SM. Effectiveness of the Malnutrition Quality Improvement Initiative on Practitioner Malnutrition Knowledge and Screening, Diagnosis, and Timeliness of Malnutrition-Related Care Provided to Older Adults Admitted to a Tertiary Care Facility: A Pilot Study. J Acad Nutr Diet. 2018;118(1):101-109. Sriram K, Sulo S, Vanderbosch G, et al. Nutrition-Focused Quality Improvement Program Results in Significant Readmission and Length of Stay Reductions for Malnourished Surgical Patients. JPEN J Parenter Enteral Nutr. 2018;42(6):1093-1098. Sulo S, Feldstein J, Partridge J, Schwander B, Sriram K, Summerfelt WT. Budget Impact of a Comprehensive Nutrition-Focused Quality Improvement Program for Malnourished Hospitalized Patients. Am Health Drug Benefits. 2017;10(5):262-270. Valladares AF, Kilgore KM, Partridge J, Sulo S, Kerr KW, Mccauley S. How a Malnutrition Quality Improvement Initiative Furthers Malnutrition Measurement and Care: Results From a Hospital Learning Collaborative. JPEN J Parenter Enteral Nutr. 2020. Vest MT, Papas MA, Shapero M, Mcgraw P, Capizzi A, Jurkovitz C. Characteristics and Outcomes of Adult Inpatients With Malnutrition. JPEN J Parenter Enteral Nutr. 2018;42(6):1009-1016.

MUC ID	Measure Title	Rationale
MUC20-0033	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	Generally, patients prefer to remain at home and avoid unnecessary hospitalizations and time in institutional settings [1]. Days at home are associated with other important outcomes, including social activity and depression [1]. Timely and appropriate primary care and end-of-life care services can increase the number of days patients spend at home [2]. Improved care coordination and care transitions prevent unplanned hospital visits, leading to more days at home and high-quality timely care [3]. High-risk patients not receiving care coordination from a nurse transition guide were more likely to be readmitted than high-risk patient who did, after adjusting for age, gender, and number of comorbidities (odds ratio 1.27, 95% CI 1.12-1.44) [4]. Dewilde et al. found an inpatient and outpatient cost savings of $99 for each additional day at home during the first three months after stroke [5]. A literature review conducted by McCaffrey et al. (2018) of end-of-life care patient studies concluded that home-based palliative care reduced costs per patient and acute care utilization, while increasing patient quality of life and time at home [6]. References: 1. Lee H, Shi SM, Kim DH. Home Time as a Patient-Centered Outcome in Administrative Claims Data. Journal of the American Geriatrics Society. 2019;67(2):347-351. 2. Totten AM, White-Chu EF, Wasson N, et al. Home-Based Primary Care Interventions. Rockville MD2016. 3. Harrison JD, Auerbach AD, Quinn K, Kynoch E, Mourad M. Assessing the impact of nurse post-discharge telephone calls on 30-day hospital readmission rates. Journal of general internal medicine. 2014;29(11):1519-1525. 4. Hoyer EH, Brotman DJ, Apfel A, et al. Improving Outcomes After Hospitalization: A Prospective Observational Multicenter Evaluation of Care Coordination Strategies for Reducing 30-Day Readmissions to Maryland Hospitals. Journal of general internal medicine. 2018;33(5):621-627. 5. Dewilde S, Annemans L, Peeters A, et al. The relationship between Home-time, quality of life and costs after ischemic stroke: the impact of the need for mobility aids, home and car modifications on Home-time. Disability and rehabilitation. 2018:1-7. 6. McCaffrey N, Agar M, Harlum J, Karnon J, Currow D, Eckermann S. Is home-based palliative care cost-effective? An economic evaluation of the Palliative Care Extended Packages at Home (PEACH) pilot. BMJ supportive & palliative care. 2013;3(4):431-435.
MUC20-0034	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	Hospital admission rates are an effective marker of ambulatory care quality. Hospital admissions from the outpatient setting reflect a deterioration in patients' clinical status and, as such, reflect an outcome that is meaningful to both patients and providers. In addition, hospitalization increases potential exposure to iatrogenic injury and the increasingly recognized toxic effects of hospitalization (e.g., sleep deprivation; poor nourishment; deconditioning from inactivity; confusion from medications; stress from mental exhaustion) leading to "post hospitalization syndrome [1]," which may contribute to the risk of readmission. Patients receiving optimal, coordinated high-quality care should use fewer inpatient services than patients receiving fragmented, low-quality care. Thus, high population rates of hospitalization may, at least to some extent, signal poor quality of care or inefficiency in health system performance. There is evidence that ambulatory care clinicians can influence admission rates by providing high quality of care [2-8]. For example, Brown et al. pointed to four ambulatory care focused Medicare Coordinated Care Demonstration programs that reduced hospitalizations for high-risk patients by 13-30 events per 100 beneficiaries per year (8-33% of hospitalizations). Brown et al. highlighted six program features that were associated with successfully

MUC ID	Measure Title	Rationale
MUC20-0034 (cont'd)	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	reducing hospitalizations: 1) supplementing patient telephone calls with in-person meetings; 2) occasionally meeting in-person with providers; 3) acting as a communication hub for providers; 4) providing patients with evidence-based education; 5) providing strong medication management; and 6) providing comprehensive and timely transitional care after hospitalizations [2]. In addition, van Loenen et al. found that higher levels of provider continuity decreased the risk of avoidable hospitalizations for ambulatory care-sensitive conditions (ACSCs) and chronic diseases [7]. Hussey et al. [9] found that among Medicare beneficiaries, greater continuity of care was associated with lower hospitalization odds (OR=0.94, CI=0.93-0.95). Favorable results (declines in admissions) were also shown by Dorr et al. (2000), Levine et al. (2012), Littleford et al. (2010), and Zhang et al. (2008) [3-5,8]. Several studies have demonstrated positive impact of early follow-up after hospitalization to reduce readmissions for HF [10-13]. Data from the Centers for Disease Control indicate that "heart failure costs the nation an estimated $30.7 billion in 2012 [18]. This total includes the cost of health care services, medicines to treat heart failure, and missed days of work". Therefore specifically, the reduction of heart failure admissions may be attributed to clinical care that represents interventions that prevent overall admission for these types of patients. Several studies have estimated the cost of HF care. One study found that between 2002-2011, direct expenditures for HF patients were four times as high as for those without HF or $3,446 after adjusting for demographics and comorbidities. Direct costs increased by about 28%, from $21,316 to $27,152, over 10 years (2002/2003 – 2010/2011), largely driven by increases in inpatient costs [14]. Another study revealed that, on average, 79% of lifetime costs of HF care are accrued during hospitalization [15]. Thus, reducing the number of hospitalizations should significantly reduce healthcare costs related to HF. Second, the measure can promote processes of care that have also been identified as cost-effective therapies. A cost-effectiveness analysis of three medical therapies compared to diuretics alone found that ACE inhibitors and the combination ACE inhibitors and beta-blockers were both cost-saving and more effective therapies. Furthermore, adding aldosterone inhibitors resulted in an additional $501/life-year, compared to ACE inhibitors and beta-blockers alone [16]. Third, effective care can reduce morbidity and, as a result, costly emergency interventions [17]. In particular, provider-led teams that work cooperatively to improve patient outcomes have been shown to reduce admission risk and, therefore, costly care. Johnston et al. found that having a disease-relevant specialist involved in a care episode resulted in a 21.3% lower incidence of ambulatory care sensitive (ACS) hospitalizations (p<0.05) but was not associated with lower rates of admissions for heart-failure related ACS or HF [9]. References 1. Krumholz HM. Post-Hospital Syndrome — An Acquired, Transient Condition of Generalized Risk. New England Journal of Medicine. 2013;368(2):100-102. 2. Brown RS, Peikes D, Peterson G, Schore J, Razafindrakoto CM. Six Features of Medicare Coordinated Care Demonstration Programs That Cut Hospital Admissions of High-Risk Patients. Health Affairs. 2012;31(6):1156-1166. 3. Dorr DA, Wilcox AB, Brunker CP, Burdon RE, Donnelly SM. The Effect of Technology-Supported, Multidisease Care Management on the Mortality and Hospitalization of Seniors. Journal of the American Geriatrics Society. 2008;56(12):2195-2202. 4. Levine S, Steinman BA, Attaway K, Jung T, Enguidanos S. Home care program for patients at high risk of hospitalization. The American journal

MUC ID	Measure Title	Rationale
MUC20-0034 (cont'd)	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	of managed care. 2012;18(8):e269-e276. 5. Littleford A, Kralik D. Making a difference through integrated community care for older people. Journal of Nursing and Healthcare of Chronic Illness. 2010;2(3):178-186. 6. Sommers LS, Marton KI, Barbaccia JC, Randolph J. Physician, Nurse, and Social Worker Collaboration in Primary Care for Chronically Ill Seniors. Archives of Internal Medicine. 2000;160(12):1825-1833. 7. Van Loenen T, Faber MJ, Westert GP, Van den Berg MJ. The impact of primary care organization on avoidable hospital admissions for diabetes in 23 countries. Scandinavian journal of primary health care. 2016;34(1):5-12. 8. Zhang NJ, Wan TTH, Rossiter LF, Murawski MM, Patel UB. Evaluation of chronic disease management on outcomes and cost of care for Medicaid beneficiaries. Health Policy. 2008;86(2):345-354. 9. Hussey PS, Schneider EC, Rudin RS, Fox DS, Lai J, Pollack CE. Continuity and the Costs of Care for Chronic Disease Care Continuity and Costs for Chronic Disease Care Continuity and Costs for Chronic Disease. JAMA Internal Medicine. 2014;174(5):742-748. 10. Donaho EK, Hall AC, Gass JA, et al. Protocol-Driven Allied Health Post-Discharge Transition Clinic to Reduce Hospital Readmissions in Heart Failure. Journal of the American Heart Association. 2015;4(12):e002296. 11. Lee KK, Yang J, Hernandez AF, Steimle AE, Go AS. Post-discharge Follow-up Characteristics Associated With 30-Day Readmission After Heart Failure Hospitalization. Medical Care. 2016;54(4):365-372. 12. Murtaugh CM, Deb P, Zhu C, et al. Reducing Readmissions among Heart Failure Patients Discharged to Home Health Care: Effectiveness of Early and Intensive Nursing Services and Early Physician Follow-Up. Health Services Research. 2017;52(4):1445-1472. 13. Ryan J, Kang S, Dolacky S, Ingrassia J, Ganeshan R. Change in Readmissions and Follow-up Visits as Part of a Heart Failure Readmission Quality Improvement Initiative. The American Journal of Medicine. 2013;126(11):989-994.e981. 14. Echouffo-Tcheugui JB, Bishu KG, Fonarow GC, Egede LE. Trends in health care expenditure among US adults with heart failure: The Medical Expenditure Panel Survey 2002-2011. Am Heart J. 2017;186:63-72. 15. Dunlay SM, Shah ND, Shi Q, et al. Lifetime costs of medical care after heart failure diagnosis. Circulation Cardiovascular quality and outcomes. 2011;4(1):68-75. 16. Banka G, Heidenreich PA, Fonarow GC. Incremental Cost-Effectiveness of Guideline-Directed Medical Therapies for Heart Failure. Journal of the American College of Cardiology. 2013;61(13):1440-1446. 17. Bilchick K, Moss T, Welch T, et al. Improving Heart Failure Readmission Costs and Outcomes With a Hospital-to-Home Readmission Intervention Program. American Journal of Medical Quality. 2018:1062860618788436. 18. Center for Medicare & Medicaid Services. National Health Expenditures 2017 Highlights.

MUC ID	Measure Title	Rationale
MUC20-0039	Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	Hospitalizations are an important indicator of patient morbidity and quality of life. On average, dialysis patients are admitted to the hospital nearly twice a year and spend an average of 11.2 days in the hospital per year [1]. Hospitalizations account for approximately 33% percent of total Medicare expenditures for End-Stage Renal Disease patients [1]. Studies have shown that improved health care delivery and care coordination may help reduce unplanned acute care including hospitalization [1]. Hospitalization rates vary across dialysis facilities even after adjustment for patient characteristics, suggesting that hospitalizations might be influenced by dialysis facility practices. An adjusted facility-level standardized hospitalization ratio, accounting for differences in patients' characteristics, plays an important role in identifying potential problems and helps facilities provide cost-effective quality health care to help limit escalating medical costs. REFERENCE [1] United States Renal Data System. 2018 United States Renal Data System annual data report: Epidemiology of kidney disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2018.
MUC20-0040	Intervention for Prediabetes	This measure is based on evidence-based guidelines from the United States Preventive Services Task Force (USPSTF) and from the American Diabetes Association (ADA). Clinicians should offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity. (USPSTF, 2015) (B recommendation). Numerous peer reviewed evidence-based publications exist on the treatment and management of patients with prediabetes. One of the largest publications to date comes from the January 2020 ADA Journal, Diabetes Care: Standards of Medical Care in Diabetes—2020. This the largest compilation of evidence and recommendations for the diagnosis and treatment of patients with prediabetes and diabetes. Patients with prediabetes should be referred to an intensive behavioral lifestyle intervention program modeled on the Diabetes Prevention Program to achieve and maintain 7% loss of initial body weight and increase moderate-intensity physical activity (such as brisk walking) to at least 150 min/week. Metformin therapy for prevention of type 2 diabetes should be considered in those with prediabetes, especially for those with BMI ≥35 kg/m2, those aged <60 years, women with prior gestational diabetes mellitus. As is the case for those with diabetes, individualized medical nutrition therapy is effective in lowering A1C in individuals diagnosed with prediabetes. Lifestyle Management: An individualized MNT program, preferably provided by a registered dietitian, is recommended for all people with type 1 or type 2 diabetes, prediabetes, or gestational diabetes mellitus.

MUC20-0042	Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM)	The PCPCM PRO-PM is based on data collected using the PCPCM PRO instrument. Validation of this instrument has been published in Annals of Family Medicine, globally the top ranked primary care peer-reviewed journal.10 It was created after conducting a thorough review of the literature of primary care measures,11 and after surveying over 1000 stakeholders (patients, clinicians, and payors) to identify what overlap currently exists between what is measured in primary care and what is most valued by those who seek care, those who provide it, and those who purchase it.12Primary care's effects are known to be better healthcare, better health, contained expenditures, and reduced disparities.1,2 Sustaining the platform and its focus is a high priority and requires measures able to promote continual improvements and investment in primary care. Most attempts to create measures for primary care focus on disease pathways, work pathways, or decisional pathways, and fail to address key elements through which primary care provides value.3 Leaders in primary care, including CMS Administrator Seema Verma, the Institute of Medicine, have noted an absence of meaningful measures and have called for measures appropriate to the task of assessing primary care, public health, stakeholder identified needs, and the certainty of health equity.3-9 The measure we describe here – the Person-Centered Primary Care Measure (PCPCM) – fulfills the call from the Institute of Medicine and from CMS to create a stakeholder informed, meaningful measure that is an assessment of quality, low burden for implementation and collection, and provides adequate ability to compare performance across clinicians and practices while providing great face validity, transparency and actionable information. The PCPCM does that. It is unusual in its combination of robust internal consistency together with breadth and brevity. Its combination of parsimony - with a single item for each of 11 diverse primary care components - and conceptual coherence - exemplified by the fact that all 11 items load onto a single factor - is the result of an unusually broad and deep amount of preparatory work grounded in diverse stakeholder engagement. This stakeholder engagement enabled the development of meaningful measure items and is the reason why the PCPCM covers 4 of the 8 "cross cutting connections" in the Meaningful Measures Framework (identified as patient-centered and meaningful to patients; fulfill requirements in programs' statues; minimize level of burden for providers; significant opportunity for improvement).28 In addition to being a useful new measure, the PCPCM adds to the field by empirically demonstrating that the broad focus of primary care is conceptually coherent, as seen and reported by the key stakeholder - patients. "A number of measures have been developed to assess different aspects of primary care.16,17,20-25 Unfortunately, they tend to be long and seldom used outside of the research setting. Clinical primary care settings often turn to patient experience surveys, such as the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG CAHPS), and researchers have recently sought to shorten the CG CAHPS in order to increase its use.26 Patient experience measures focus important attention to the consumer experience of care delivery and receipt of services but fall short of focused attention to the broad scope of primary care functions and care.13,15Our team has conducted an extensive survey of measures used to assess primary care.1 No patient reported measure is previously existing that offers a patient reported assessment of full scope primary care. "In its combination of breadth, internal consistency, and parsimony, the PCPCM complements other existing measures of primary care. The measure's detailed exposition of specific attributes of primary care, grounded in extensive advance work

| MUC20-0042 (cont'd) | Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM) | and member-checking with patients, clinicians and policymakers, allows evaluation of the specific mechanisms by which primary care adds value, and thus complements more global assessments of primary care, such as having a usual source of care.29-31 In its parsimony, the PCPCM complements other patient-report measures of primary care that measure fewer domains, but with multiple items per domain,32-36 or that measure aspects of primary care for specific purposes.37-40 The PCPCM-PM is the first measure developed to meet these nationally identified needs. The PCPCM also addresses a critical quality measure gap as identified by the MACRA-MDP Technical Expert Panel, of which Dr. Etz – the developer of the PCPCM – was a part.41 Primary care reports on 94 Centers for Medicare and Medicaid Services (CMS) measures, more than any other specialty.23 In a national survey of primary care physicians, fewer than 25% expressed a positive opinion of quality measures used.24 Other studies found family medicine physicians among the most dissatisfied with levels of clerical burden and with some of the highest rates of burnout.25-29 The National Academy of Medicine, previously the IOM, has stated that there is no national consensus regarding how best to measure primary care delivery and performance.42 The Vital Signs report of the IOM defined the need for stakeholder created and informed measures, as opposed to measures that begin with subject matter experts and only later, if at all, rely on stakeholder input.14 The PCPCM was designed with this as its basis. References: 1. Phillips RL and Bazemore AW. Primary Care and Why It Matters for US Health System Reform. Hlth Aff. 2010;29(5):806-810. 2. Starfield B, Shi LY, Macinko J. Contribution of primary care to health systems and health. Milbank Q, 2005;83:457-502. 3. Stange KC, Etz RS, Gullet H, et. al. Metrics for Assessing Improvements in Primary Health Care. ARPH. 2014:423-42. 4. The Center for Medicare and Medicaid Services. Remarks by Administrator Seema Verma at the Health Care Payment Learning and Action Network (LAN) Fall Summit press@cms.hhs.gov; 2017. 5. Berwick DM. Era 3 for Medicine and Health Care. JAMA. 2016 Apr 5;13:1329-30. 6. Blumenthal D, Malphrus E, McGinnis JM, eds. Vital Signs: Core Metrics for Health and Health Care Progress. 2015. 7. Berenson RA, Rich EC. US approaches to physician payment: the deconstruction of primary care. J Gen Intern Med. 2010;25:613-618. 8. Conway, PH and the Core Quality Measures Collaborative Workgroup. The Core Quality Measures Collaborative: A Rationale And Framework For Public-Private Quality Measure Alignment. June 23, 2015 Health Aff Blog http://healthaffairs.org/blog/2015/06/23/the-core-quality-measures-collaborative-a-rationale-and-framework-for-public-private-quality-measure-alignment/ Accessed July 17, 2016. 9. Rich EC, O'Malley AS. Measuring what matters in primary care. October 6, 2015. Health Aff Blog http://healthaffairs.org/blog/2015/10/06/measuring-what-matters-in-primary-care/ Accessed December 3, 2015. 10. Etz RS, Zyzanski SJ, Gonzalez MM, Reves SR, O'Neal JP, Stange KC. A New Comprehensive Measure of High-Value Aspects of Primary Care. Ann Fam Med. 2019 May;17(3):221-230. 11. Stange KC, Etz RS, Gullett H, et al. Metrics For Assessing Improvements In Primary Health Care. Annual review of public health. 2014;35:423-442. 12. Etz RS, Gonzalez MM, Brooks EM, Stange KC. Less AND more are needed to assess primary care. J Am Board Fam Med. 2017; 30(1): 13–15. 13. Stange KC, Etz RS, Gullett H, et al. Metrics For Assessing Improvements In Primary Health Care. Annual review of public health. 2014;35:423-442. 14. In: Blumenthal D, Malphrus E, McGinnis JM, eds. Vital Signs: Core Metrics for Health and Health Care Progress. Washington (DC)2015. 15. Etz RS, Gonzalez MM, Brooks EM, Stange KC. Less AND More Are Needed to |

| MUC20-0042 (cont'd) | Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM) | Assess Primary Care. J Am Board Fam Med. 2017;30(1):13-15. 16. Howie JG, Heaney DJ, Maxwell M, Walker JJ. A comparison of a Patient Enablement Instrument (PEI) against two established satisfaction scales as an outcome measure of primary care consultations. Fam Pract. 1998;15(2):165-171. 17. Wasson JH, Ho L, Soloway L, Moore LG. Validation of the What Matters Index: A brief, patient-reported index that guides care for chronic conditions and can substitute for computer-generated risk models. PLoS One. 2018;13(2):e0192475. 20. Jabbarpour Y. Measures in Primary Care. An annotated bibliography. Starfield Summit; April 2016, 2016; Washington, DC. 21. 2017. Etz, RS and the Starfield Writing Team. Conference Brief: Framework of PC Measure Domains and Key Elements. Starfield Summit III: Washington, DC. Accessed January 6, 2020, http://www.starfieldsummit.com/resources3 22. Etz RS, Gonzalez MM, Brooks EM, Stange KC. Less AND more are needed to assess primary care. J Am Board Fam Med. 2017; 30(1): 13–15. 23. Etz RS, Zyzanski SJ, Gonzalez MM, Reves SR, O'Neal JP, Stange KC. A New Comprehensive Measure of High-Value Aspects of Primary Care. Ann Fam Med. 2019 May;17(3):221-230. 24. Howie JG, Heaney DJ, Maxwell M, Walker JJ. A comparison of a Patient Enablement Instrument (PEI) against two established satisfaction scales as an outcome measure of primary care consultations. Fam Pract. 1998; 15(2): 165–171. 25. Wasson JH, Ho L, Soloway L, Moore LG. Validation of the What Matters Index: A brief, patient-reported index that guides care for chronic conditions and can substitute for computer-generated risk models. PLoS One. 2018; 13(2): e0192475. 26. Wasson JH, Soloway L, Moore LG, Labrec P, Ho L. Development of a care guidance index based on what matters to patients. Qual Life Res. 2018; 27(1): 51–58. 27. 2003. Norman GR, Sloan JA, Wyrwich KW. Interpretation of changes in health-related quality of life: the remarkable universality of half a standard deviation. Med Care 41, 582-592. 28. Meaningful Measures Framework of CMS. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/CMS-Quality-Strategy Accessed June 27, 2020. 29. Jerant A, Fenton JJ, Franks P. Primary care attributes and mortality: a national person-level study. Ann Fam Med. 2012;10(1):34-41. 30. DeVoe JE, Tillotson CJ, Wallace LS, Angier H, Carlson MJ, Gold R. Parent and child usual source of care and children's receipt of health care services. Ann Fam Med. 2011;9(6):504-13. 31. Ettner SL. The timing of preventive services for women and children: the effect of having a usual source of care. Am J Public Health. 1996;86(12):1748-54.32. Jabbarpour Y. Measures in Primary Care. An annotated bibliography. Starfield Summit; April 2016; Washington, DC: Robert Graham Center / Eugene S. Farley, Jr. Health Policy Center; 2016. p. 15. 33. Shi L, Starfield B, Xu J. Validating the adult primary care assessment tool. J Fam Pract. 2001;50(2):161W-75W. 34. Safran DG, Kosinski M, Tarlov AR, Rogers WH, Taira DH, Lieberman N, et al. The Primary Care Assessment Survey: tests of data quality and measurement performance. Med Care. 1998;36(5):728-39. 35. Flocke SA, Stange KC, Zyzanski SJ. The association of attributes of primary care with the delivery of clinical preventive services. Med Care. 1998;36(8 Suppl):AS21-30. 36. Flocke SA. Measuring attributes of primary care: development of a new instrument. J Fam Pract. 1997;45(1):64-74. 37. Mercer SW, Howie JG. CQI-2--a new measure of holistic interpersonal care in primary care consultations. Br J Gen Pract. 2006;56(525):262-8. 38. Mercer SW, McConnachie A, Maxwell M, Heaney D, Watt GC. Relevance and practical use of the Consultation and Relational Empathy (CARE) Measure in general practice. Fam Pract. 2005;22(3):328-34. 39. Given CW, Branson M, Zemach R. Evaluation and |

MUC ID	Measure Title	Rationale
MUC20-0042 (cont'd)	Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM)	application of continuity measures in primary care settings. J Community Health. 1985;10(1):22-41. 40. Solomon LS, Hays RD, Zaslavsky AM, Ding L, Cleary PD. Psychometric properties of a group-level Consumer Assessment of Health Plans Study (CAHPS) instrument. Med Care. 2005;43(1):53-60. 41. CMS Quality Measure Development Plan Technical Expert Panel Meeting Summary, November 17, 2016. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MDP_TEP_Nov17_MtgSummary.pdf Accessed July 24, 2020. 42. Vital Directions for Health and Healthcare. Accessed September 2017. https://nam.edu/initiatives/vital-directions-for-health-and-health-care/.
MUC20-0043	Preventive Care and Wellness (composite)	Each component measure corresponds to a measure currently used for PY2020 reporting in MIPS, some of which are also NQF-endorsed measures, meaning the evidence for each measure has been evaluated by CMS, and in some cases by an NQF committee, and determined to have enough evidence to support the measure intent and inclusion in MIPS. Component measures endorsed by NQF: Quality ID 110: Preventive Care and Screening: Influenza Immunization (NQF #0041); Quality ID 112: Breast Cancer Screening (NQF #2372); Quality ID 113: Colorectal Cancer Screening (NQF #0034); Quality ID 226: Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention (NQF #0028). Component measures not endorsed by NQF: Quality ID 111: Pneumococcal Vaccination Status for Older Adults; Quality ID 128: Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow-Up Plan; Quality ID 317: Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented.
MUC20-0044	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Health care practice requires close personal exposure to patients, contaminated environment, or infectious material from patients with SARS-CoV-2, putting HCP at high risk of infection and contributing to further spread of COVID-19. (Nguyen et al. 2020) In addition to infection control and early detection of COVID-19, vaccination is expected to be one of the most effective ways to prevent COVID-19 and transmission of SARS-CoV-2. Sufficient vaccination coverage of HCP can protect the health of the nation's healthcare workforce and reduce transmission of SARS-CoV-2 in health care facilities, thereby protecting the health of both HCP and patients.
MUC20-0045	SARS-CoV-2 Vaccination by Clinicians	As of December 6, 2020, the Centers for Disease Control and Prevention (CDC) reported 14,462,527 cases of Coronavirus Disease 2019 (COVID-19) and 280,135 deaths. A vaccine for SARS-CoV-2, the virus that causes COVID-19, will be critically important to stemming the morbidity and mortality caused by this disease. While a SARS-CoV-2 vaccine has not yet been approved by the U.S. Food and Drug Administration, there is a large number of trials underway seeking to find viable vaccines. This measure builds off other vaccination measures in the MIPS program as much as possible. Other vaccination measures that are already in MIPS indicate performance gaps. According to 2020 benchmarks, the average performance for the CQM version of Preventive Care and Screening: Influenza Immunization was 58.5 percent. The average performance for the CQM version of Pneumococcal Vaccination Status for Older Adults was 61 percent.

MUC ID	Measure Title	Rationale
MUC20-0048	SARS-CoV-2 Vaccination Coverage for Patients in End-Stage Renal Disease (ESRD) Facilities	The virus causing Coronavirus Disease 2019 (COVID-19) can cause outbreaks in end-stage renal disease facilities. Many patients served in ESRDs have other underlying chronic conditions, and therefore are highly susceptible to illness and disease. COVID-19 may disproportionately affect ESRD patients due to the nature of the treatment and sharing of common spaces. In addition to infection control and early detection of COVID-19, vaccination is expected to be one of the most effective ways to prevent COVID-19 and its transmission. Sufficient vaccination coverage among patients in ESRD facilities may reduce transmission of SARS-CoV-2, thereby protecting them from COVID-19 mortality.

APPENDIX C: MEASURES LISTED BY PROGRAM

December 21, 2020

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Chronic and Post-Acute Care Measures Programs

Home Health Quality Reporting Program

MUC ID	CMS Program[7]	Measure Title	Quality Priority	Meaningful Measure Area
No new candidate measures were approved for consideration under this program in the current year.				

Hospice Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0030	HQRP	Hospice Care Index	Strengthen person and family engagement as partners in their care	End of life care according to preferences

Inpatient Rehabilitation Facility Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0044	IRF QRP	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

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[7] A single unique measure can be associated with more than one CMS Program.

Long-Term Care Hospital Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0044	LTCH QRP	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

Skilled Nursing Facility Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0002	SNF QRP	Skilled Nursing Facility Healthcare-Associated Infections Requiring Hospitalization	Make care safer by reducing harm caused in the delivery of care	Healthcare-associated infections
MUC20-0044	SNF QRP	SARS-CoV-2 Vaccination Coverage for Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

Skilled Nursing Facility Value-Based Purchasing Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
No new candidate measures were approved for consideration under this program in the current year.				

Ambulatory Care and Meaningful Use Measures Programs

Merit-Based Incentive Payment System

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0015	MIPS	Asthma/Chronic Obstructive Pulmonary Disease (COPD) Episode-Based Cost Measure	Make care affordable	Patient-focused episode of care
MUC20-0016	MIPS	Colon and Rectal Resection Episode-Based Cost Measure	Make care affordable	Patient-focused episode of care
MUC20-0017	MIPS	Diabetes Episode-Based Cost Measure	Make care affordable	Patient-focused episode of care
MUC20-0018	MIPS	Melanoma Resection Episode-Based Cost Measure	Make care affordable	Patient-focused episode of care
MUC20-0019	MIPS	Sepsis Episode-Based Cost Measure	Make care affordable	Patient-focused episode of care
MUC20-0034	MIPS	Risk-Standardized Acute Unplanned Cardiovascular-Related Admission Rates for Patients with Heart Failure for the Merit-based Incentive Payment System	Promote effective prevention and treatment of chronic disease	Management of chronic conditions
MUC20-0040	MIPS	Intervention for Prediabetes	Promote effective prevention and treatment of chronic disease	Preventive care
MUC20-0042	MIPS	Person-Centered Primary Care Measure Patient Reported Outcome Performance Measure (PCPCM PRO-PM)	Strengthen person and family engagement as partners in their care	Care is personalized and aligned with patient's goals
MUC20-0043	MIPS	Preventive Care and Wellness (composite)	Promote effective prevention and treatment of chronic disease	Preventive care
MUC20-0045	MIPS	SARS-CoV-2 Vaccination by Clinicians	Promote effective prevention and treatment of chronic disease	Preventive care

Part C & D Star Rating

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
No new candidate measures were approved for consideration under this program in the current year.				

Medicare Shared Savings Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0033	MSSP	ACO-Level Days at Home for Patients with Complex, Chronic Conditions	Promote effective prevention and treatment of chronic disease	Management of chronic conditions

Hospital Measures Programs

Ambulatory Surgical Center Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0044	ASC QRP	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

End-Stage Renal Disease Quality Incentive Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0039	ESRD QIP	Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	Promote effective prevention and treatment of chronic disease	Management of chronic conditions
MUC20-0044	ESRD QIP	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care
MUC20-0048	ESRD QIP	SARS-CoV-2 Vaccination Coverage for Patients in End-Stage Renal Disease (ESRD) Facilities	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

Hospital-Acquired Condition Reduction Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
No new candidate measures were approved for consideration under this program in the current year.				

Hospital Inpatient Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0003	Hospital IQR Program	Hospital-Level, Risk-Standardized Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA)	Strengthen person and family engagement as partners in their care	Functional outcomes
MUC20-0032	Hospital IQR Program	Global Malnutrition Composite Score	Promote effective communication and coordination of care	Admissions and readmissions to hospitals
MUC20-0044	Hospital IQR Program	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

Hospital Outpatient Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0004	Hospital OQR Program	Appropriate Treatment for ST-Segment Elevation Myocardial Infarction (STEMI) Patients in the Emergency Department (ED)	Make care safer by reducing harm caused in the delivery of care	Healthcare-associated infections
MUC20-0005	Hospital OQR Program	Breast Screening Recall Rates	Make care affordable	Appropriate use of healthcare
MUC20-0044	Hospital OQR Program	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

Hospital Readmissions Reduction Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
No new candidate measures were approved for consideration under this program in the current year.

Hospital Value-Based Purchasing Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
No new candidate measures were approved for consideration under this program in the current year.

Inpatient Psychiatric Facility Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0044	IPF QRP	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care

Medicare and Medicaid Promoting Interoperability Program for Eligible Hospitals (EHs) or Critical Access Hospitals (CAHs)

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0032	Promoting Interoperability (EH-CAH)	Global Malnutrition Composite Score	Promote effective communication and coordination of care	Admissions and readmissions to hospitals

PPS-Exempt Cancer Hospital Quality Reporting Program

MUC ID	CMS Program	Measure Title	Quality Priority	Meaningful Measure Area
MUC20-0044	PCHQR	SARS-CoV-2 Vaccination Coverage among Healthcare Personnel	Promote Effective Prevention and Treatment of Chronic Disease	Preventive care