# NATIONAL QUALITY FORUM

## NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT

**DRAFT REPORT**

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## EXECUTIVE SUMMARY

The results or outcomes of an episode of healthcare are inherently important because they reflect the reason consumers seek healthcare (e.g., to improve function, decrease pain, or survive), as well as the result healthcare providers are trying to achieve. Outcome measures also provide an integrative assessment of quality reflective of multiple care processes across the continuum of care. There are a variety of types of outcome measures such as health or functional status, physiologic measurements, adverse outcomes, patient experience with care, and morbidity and mortality. To date NQF has endorsed more than 200 outcome measures in a variety of topic areas. As greater focus is placed on evaluating the outcome of episodes of care, additional measures of patient outcomes are needed to fill gaps in the current portfolio.

This report presents the results of the evaluation of 12 measures considered under NQF's CDP. Eight measures are recommended for endorsement as voluntary consensus standards suitable for public reporting and quality improvement.

- Intensive care: in-hospital mortality rate (Phillip R. Lee Institute for Health Policy Studies, University of California San Francisco) This measure is paired with OT1-023-09 Intensive care unit (ICU) length-of-stay (LOS).
- Intensive care unit (ICU) length-of-stay (LOS) (Phillip R. Lee Institute for Health Policy Studies, University of California San Francisco). This measure is paired with OT1-024-09 Intensive care: in-hospital mortality rate.
- Hospital risk-standardized complication rate following implantation of implantable cardioverter-defibrillator (ICD) (Yale University/CMS)
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# NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT

## BACKGROUND

The results or outcomes of an episode of healthcare are inherently important because they reflect the reason consumers seek healthcare (e.g., to improve function, decrease pain, or survive), as well as the result healthcare providers are trying to achieve. Patient outcomes reflect the wide assortment of care processes and coordination of efforts among all caregivers as well as other contributing factors that determine the end result of an episode of care.

Donabedian defined outcomes as "changes (desirable or undesirable) in individuals and populations that are attributed to healthcare."[1] Outcome measures also provide an integrative assessment of quality reflective of multiple care processes across the continuum of care. There are a variety of types of outcome measures. Some represent an end result such as mortality or function; others are considered intermediate outcomes (e.g., physiological or biochemical values such as blood pressure or LDL cholesterol) that precede and may lead to a longer-range end-result outcome. Sometimes proxies are used to indicate an outcome (e.g., hospital readmission indicates deterioration in health status since discharge). To date NQF has endorsed more than 200 outcome measures in a variety of topic areas (Appendix C). As greater focus is placed on evaluating the outcome of episodes of care, additional measures of patient outcomes are needed to fill gaps in the current portfolio.

## STRATEGIC DIRECTIONS FOR NQF

NQF's mission includes three parts: 1) setting national priorities and goals for performance improvement, 2) endorsing national consensus standards for measuring and publicly reporting on performance, and 3) promoting the attainment of national goals through education and outreach programs. As greater numbers of quality measures are developed and brought to NQF for consideration of endorsement, it is incumbent on NQF to assist stakeholders to "measure what makes a difference" and address what is important to achieve the best outcomes for patients and

populations. For more information see http://
www.qualityforum.org/projects/Patient_Outcome_Measures_Phases1-2.aspx.

Several strategic issues have been identified to guide consideration of candidate consensus standards:

- **Drive toward high performance.** Over time, the bar of performance expectations should be raised to encourage the achievement of higher levels of system performance.
- **Emphasize composites.** Composite measures provide much-needed summary information pertaining to multiple dimensions of performance and are more comprehensible to patients and consumers.
- **Move toward outcome measurement.** Outcome measures provide information of keen interest to consumers and purchasers, and when coupled with healthcare process measures, they provide useful and actionable information to providers. Outcome measures also focus attention on much-needed system-level improvements, because achieving the best patient outcomes often requires carefully designed care processes, teamwork, and coordinated action on the part of many providers.
- **Focus on disparities in all that we do.** Some of the greatest performance gaps relate to care of minority populations. Particular attention should be focused on the most relevant race/ethnicity/language/socioeconomic strata to identify relevant measures for reporting.

## NATIONAL PRIORITIES PARTNERSHIP

NQF seeks to endorse measures that address the National Priorities and Goals of the National Priorities Partnership.[2] The National Priorities Partnership represents those who receive, pay for, provide, and evaluate healthcare. The National Priorities and Goals focus on these areas:

- patient and family engagement,
- population health,
- safety,
- care coordination,

- palliative and end-of-life care, and
- overuse.

## NQF'S CONSENSUS DEVELOPMENT PROCESS (CDP)

### Patient Outcomes Project

NQF's "National Voluntary Consensus Standards for Patient Outcomes "project[3] seeks to endorse additional outcome measures with an emphasis on high-impact (high-volume, high-morbidity, high-cost) conditions and cross-cutting areas. The Patient Outcomes project is structured in several phases:

- Phases 1 and 2— cross-cutting measures and measures on cardiovascular, pulmonary, and bone/joint conditions as well as chronic kidney disease, diabetes, and several types of cancers; and
- Phase 3— Child Health and Mental Health.

Additionally, the project will identify gaps in important outcome measures.

### Scope of Patient Outcomes

The Steering Committee defined outcomes quite broadly to encompass a variety of types of patient outcomes within the scope of this project:

- patient function, symptoms, health-related quality of life (physical, mental, social);
- intermediate clinical outcomes (physiologic, biochemical);
- patient experience with care; knowledge, understanding, motivation; health risk status or behavior (including adherence);
- service utilization as a proxy for patient outcome (e.g., change in condition) or potential indicator of efficiency;
- non-mortality clinical morbidity related to disease control and treatment;
- healthcare-acquired adverse event or complication (non-mortality); and
- mortality.

## Evaluating Potential Consensus Standards

This first report presents the evaluation of an initial group of 12 measures in the areas of pulmonary/intensive care and cardiovascular conditions. Candidate consensus standards were solicited through a Call for Measures in September 2009 and actively sought through searches of the National Quality Measures Clearinghouse, NQF Member websites, and an environmental scan. NQF staff contacted potential measure stewards to encourage submission of measures for this project.

Twelve measures were evaluated for suitability as voluntary consensus standards for accountability and public reporting in this first phase.

The measures were evaluated using NQF's standard evaluation criteria.[4] Either the Pulmonary/ICU Technical Advisory Panel (TAP) or the Cardiovascular TAP rated the sub-criteria for each candidate consensus standard and identified strengths and weaknesses to assist the project Steering Committee (Committee) in making recommendations. The 24-member, multistakeholder Committee provided final evaluations of the four main criteria: importance to measure and report; scientific acceptability of the measure properties; usability; and feasibility, as well as the recommendation for endorsement. Measure developers participated in the TAP and Committee discussions to respond to questions and clarify any issues or concerns.

## RECOMMENDATIONS FOR ENDORSEMENT

This report presents the results of the evaluation of 12 measures considered under NQF's CDP. Eight measures are recommended for endorsement as voluntary consensus standards suitable for public reporting and quality improvement.

## Candidate Consensus Standards Recommended for Endorsement

**OT1-007-09: Hospital risk-standardized complication rate following implantation of implantable cardioverter-defibrillator (ICD) (Yale University/CMS)** *This measure provides hospital specific risk-standardized rates of procedural complications following the implantation of an ICD in Medicare Fee for Service (FFS) patients at least 65 years of age. The measure uses*

*clinical data available in the National Cardiovascular Data Registry (NCDR) ICD Registry for risk adjustment that has been linked with CMS administrative claims data used to identify procedural complications.*

This measure was designed to combine clinical data from the National Cardiovascular Data Registry (NCDR)[6] ICD Registry and administrative data. All patients over age 65 years are required to be entered into the registry and 70 percent of hospitals report all patients to NCDR. The TAP and SC agree that the measure is important in addressing a costly procedure that has a high complication rate (18 percent). The TAP also commended the strong performance characteristics of the risk model. SC Members were interested in including patients below age 65 years. The measure developers advised the Committee that the measure was developed in the Medicare ≥65 fee-for-service population as this is the only cohort of patients in whom the data was available to reliably identifying outcomes (complications and vital status) beyond the index hospitalization. The measure could be applied to a broader population of patients undergoing ICD implantation if the required data elements were available with some additional work to optimize the risk adjustment methodology.

A Committee member noted that the variation of values in the technical report is very narrow due to hierarchical modeling and won't discriminate among providers. Others suggested that clustering of complication rate at 18 percent represents opportunity for improvement overall. This measure addresses the National Priority of safety.

**OT1-008-09: Hospital 30-day risk-standardized readmission rates following percutaneous coronary intervention (PCI) (Yale/CMS)** *This measure estimates hospital risk-standardized 30-day readmission rates following PCI in Medicare Fee for Service (FFS) patients at least 65 years of age. As PCI patients may be readmitted electively for staged revascularization procedures, we will exclude such elective readmissions from the measure. The measure uses clinical data available in the National Cardiovascular Disease Registry (NCDR) CathPCI Registry for risk adjustment that has been linked with the CMS administrative claims data used to identify readmissions.*

The measure developers advised the Committee and TAP that this measure was developed using the same approach as the NQF-endorsed® readmission measure for AMI. Twenty-nine percent of patients undergoing PCI have also had an MI and will be captured in both measures. The major discussion centered on the all-cause readmissions and the 30-day timeframe. Some TAP and Committee members suggested that a 15-day timeframe would be more directly related to the antecedent PCI procedure. The measure developer presented their hazard of readmission analysis over 90 days that found that risk of readmission was greatest in the first 15 days but remained elevated up to 60 days following discharge (with a plateau between 30 to 45 days). The developer asserted that a shorter timeframe would have a stronger association with the initial care of the patients but would miss the substantial number of readmissions between 15 to 30 days that are likely attributable to the care delivered within the index hospitalization and during the transition from that setting.

TAP and Committee members noted that the risk model performance characteristics are not as strong as some measures, such as ICU mortality, but are comparable to other readmission measures endorsed by NQF. Again, the Committee recommended broadening the population and not specifying the measure by type of insurance. The developer replied that the measure can be applied to a broader population if the data are available, and inclusion of other populations will require re-estimation of the model covariates. The measure addresses the National Priority of overuse.

**OT1-016-09: 30-Day post-hospital AMI discharge care transition composite measure (Brandeis University/CMS)** *This measure scores a hospital on the incidence among its patients during the month following discharge from an inpatient stay having a primary diagnosis of AMI for three types of events: readmissions, ED visits, and evaluation and management (E&M) services.*

*Component measures:*

- *0505 30-Day all-cause risk standardized readmission rate following acute myocardial infarction (AMI) hospitalization*
- *OT1-002-09: 30-Day post-hospital AMI discharge ED visit rate*

- *OT1-003-09: 30-Day post-hospital AMI discharge evaluation and management service*

**OT1-017-09: 30-Day post-hospital heart failure (HF) discharge care transition composite measure (Brandeis University/CMS)** *This measure scores a hospital on the incidence among its patients during the month following discharge from an inpatient stay having a primary diagnosis of heart failure for three types of events: readmissions, ED visits, and evaluation and management (E&M) services.*

*Component measures:*

- *0330 30-Day all-cause risk standardized readmission rate following heart failure hospitalization*
- *OT1-006-09: 30-Day post-hospital HF discharge ED visit rate*
- *OT1-004-09: 30-Day post-hospital HF discharge evaluation and management service*

These two composite measures were developed using the same methodology. The composite measures bring together NQF-endorsed readmission measures for AMI (0505) and heart failure (0330) and new measures for ED visits and evaluation and management (E&M) services within 30 days of discharge for AMI or HF. The development team assigned weights of (-4) for readmissions, (-2) for ED visits, and (+1) for E&M services to arrive at the composite score. The developers suggested that these weightings represent the values of a desirable post-discharge care trajectory in which readmissions are least desirable, ED visits are not desirable but are less so than a readmission, and follow-up outpatient care is desirable.

The measure developers presented an analysis of the spread of sample composite scores from high to low and the relative contributions of the three component measures. Some Committee members found the mix of positive and negative weightings arbitrary and confusing; others thought a composite of readmission and ED visits would be more meaningful for care transitions. A majority of Committee members found the composite measures addressed care transitions and the outcomes of hospitalization. These measures address the National Priority of care coordination.

**OT1-023-09: Intensive care unit (ICU) length-of-stay (LOS) (Phillip R. Lee Institute for Health Policy Studies, University of California San Francisco) This measure is paired with OT1-024-09: Intensive care: in-hospital mortality rate.** *For all patients admitted to the ICU, total duration of time spent in ICU until time of discharge; both observed and risk-adjusted LOS reported with the predicted LOS measured using an adjustment model based on the (Mortality Probability Model) MPM III.*

The TAP and Committee agreed that length of stay is an important outcome, particularly in terms of resource use and efficiency; however, all agreed that the ICU LOS measure must be paired with the ICU mortality measure to balance potential unintended consequences of inappropriate reductions in LOS. The LOS measure uses the same risk-adjustment model and data collection as the ICU mortality measure. TAP and Committee members noted some issues around identifying the start of an ICU stay, particularly with patients remaining in the emergency department for long periods of time before admission to the ICU. Again, the Committee noted there are cultural influences that affect the length of stay, so some means to address disparities is strongly recommended. This measure addresses the National Priority of overuse.

**OT1-024-09: Intensive care: in-hospital mortality rate (Phillip R. Lee Institute for Health Policy Studies, University of California San Francisco) This measure is paired with OT1-023-09: Intensive care unit (ICU) length-of-stay (LOS).** *For all adult patients admitted to the ICU, the percentage of patients whose outcome is death; both observed and risk-adjusted mortality rates are reported using predicted rates based on the (Mortality Probability Model) MPM III.*

Both Pulmonary/ICU TAP and Committee members agreed this measure is an important outcome, with documented variation in outcomes. The TAP rated this measure highly for its technical characteristics. The risk model[5] has been published and refined over several years. It is parsimonious compared to other models such as APACHE or SAPA III and demonstrates strong performance characteristics. Committee members were extremely interested in how disparities might be handled. Race, ethnicity, and socioeconomic status (SES) are not included in the risk model, which is consistent with NQF's evaluation criteria. The developer noted that data for

SES, race, and ethnicity are generally not available. Committee members suggested insurance type or zip code might be proxies. The Committee strongly encouraged the measure developers to consider how to address disparities for future implementation. This measure is voluntarily reported by 246 hospitals in California on www.CalHospitalCompare. Data collection is compatible with EHRs (some vendors have already built in the data elements), and an electronic submission tool is available.

## Candidate Consensus Standards Recommended for Time-Limited Endorsement[7]

**OT1-019-09: Health-related quality of life in COPD patients before and after pulmonary rehabilitation (AACVPR)** *The percentage of patients with COPD enrolled in pulmonary rehabilitation (PR) who are found to increase their health-related quality of life score (HRQOL).*

TAP and Committee members noted that a new Medicare benefit for pulmonary rehabilitation effective January 2010 will increase the number of PR providers and as well as referrals to PR. Committee members noted that there are few endorsed measures of quality of life—a significant gap in NQF's portfolio. This measure does not address appropriate referrals for PR and captures only patients who complete PR. TAP members suggest that lack of completing the PR program may indicate a quality problem. The Chronic Respiratory Disease Questionnaire (CRQ) specified in the measure is well tested and validated and widely used in PR programs. However, some alternative tools are equally validated and used widely, such as the St. George's Respiratory Questionnaire (SGRQ).

There were some concerns with the selection of the age inclusion. The Pulmonary TAP specifically questioned why age 20 and above was chosen, since COPD generally presents later in life and younger patients usually have asthma and not COPD. The developers responded that the lower age will capture patients with alpha-1 antitrypsin deficiency; however, in the interest of harmonization,[8] the developers are willing to use age $\geq$ 40 years.

Although the CRQ tool has been well tested and validated at the individual patient level, this measure, as specified, has not been tested for reliability and validity as a performance measure and is therefore recommended for time-limited endorsement. The HRQOL survey is performed

as part of care, and while typically hand-scored at the current time, there is no reason it cannot be embedded in an EHR. AACVPR also anticipates establishing a registry to collect data. This measure addresses the National Priority of patient and family engagement.

**OT1-020-09: Functional capacity in COPD patients before and after pulmonary rehabilitation (AACVPR)** *The percentage of patients who are enrolled in pulmonary rehabilitation (PR) who are found to increase their functional capacity by at least 25 meters (176 feet), as measured by a standardized 6-minute walk test (6MWT).*

The 6MWT is a widely used and well-validated assessment of functional status of individual patients. TAP members were initially concerned with the original submission that specified a 54-meter threshold that seemed quite high. A new publication in February 2010[9] indicated that a threshold of 25 meters is more reasonable, and the measure was aligned with the newest data. The issues regarding appropriate referral, completion of PR programs, age inclusion, and testing are the same as for the HRQOL measure.

## Candidate Consensus Standards not Recommended for Endorsement

The following measures are included in the AMI and Heart Failure Care Transitions Composite measures recommended for endorsement. Although the Committee recommended them as part of the composite measure, a narrow majority of Committee members did not recommend these as stand-alone measures.

**OT1-002-09: 30-Day post-hospital AMI discharge ED visit rate (Brandeis University/CMS)** *This measure estimates the percentage of Medicare beneficiaries (age 65 years and older) discharged from the hospital with a diagnosis of AMI and evidence of an emergency department (ED) visit within 30 days of discharge and prior to a readmission.*

**OT1-006-09: 30-Day post-hospital HF discharge ED visit rate (Brandeis University/CMS)** *This measure estimates the percentage of Medicare beneficiaries (age 65 years and older) discharged from the hospital with a diagnosis of heart failure (HF) and evidence of an emergency department (ED) visit within 30 days of discharge and prior to a readmission.*

TAP and Committee members were concerned with "all-cause" ED visits, particularly ED visits for issues unrelated to the recent hospitalization. Committee members noted wide variation in local use of EDs, particularly in areas with limited primary care services or where sending patients to the ED after hours is common practice. Committee members noted that the risk model performance is not robust, and the developers replied that these risk models perform similarly to the endorsed readmission measures that use the same methodology.

**OT1-003-09: 30-Day post-hospital AMI discharge evaluation and management service (Brandeis University/CMS)** *This measure estimates the percentage of Medicare beneficiaries age 65 years and older discharged from the hospital with the diagnosis of AMI receiving an evaluation and management service within 30 days of the hospital discharge and prior to a hospital readmission or ED visit.*

**OT1-004-09: 30-Day post-hospital HF discharge evaluation and management service (Brandeis University/CMS)** *This measure estimates the percentage of Medicare beneficiaries age 65 years and older discharged from the hospital with the diagnosis of heart failure receiving an evaluation and management service within 30 days of the hospital discharge and prior to a hospital readmission or ED visit.*

Committee members agreed that post-discharge follow-up is important but that a specific E&M may not be the only effective mechanism to achieve care coordination. Committee members cited ongoing approaches to reduce readmissions in their own institutions that include nurse visits, as demonstrated in the research of Dr. Mary Naylor,[10,11] or other innovative approaches. Committee members reported that some regional CMS carriers do not accept billing for certain types of nurse visits, so innovative approaches to reduce readmissions may be stifled by crediting only E&M services.

## Additional Recommendations

1. **Apply measures to the broadest populations possible.**

   The Committee strongly recommends that measure developers consider the broadest application of measures and not include restrictive specifications, such as payer or coverage type, or age limitations, unless appropriate for the condition.

2. **More attention to disparities is needed.**

   The Committee strongly recommends that measure developers address measurement of disparities in measure specifications. According to NQF measure evaluation criteria, factors such as race, ethnicity, and socioeconomic status should not be included in risk models; however, the data should be collected to allow for stratification. Some providers serve patient populations that are extremely vulnerable to disparities, and the stratified results would not be small numbers.

3. **Provide rationale for use of hierarchical modeling.**

   Committee members recommend that measure developers provide the rationale for using hierarchical modeling and describe the impact on discrimination and usability of the results for public reporting and quality improvement.

## NOTES


1. Donabedian A, The quality of care. How can it be assessed? *JAMA*, 1988; 260(12):1743-1748.
2. National Quality Forum (NQF). *National Priorities Partnership*. Washington, DC: NQF. Available at www.nationalprioritiespartnership.org. Last accessed April 2010.
3. www.qualityforum.org/projects/Patient_Outcome_Measures_Phases1-2.aspx. Last accessed April 2010.
4. NQF. *Measure Evaluation Criteria*. Washington, DC: NQF, 2008. Available at www.qualityforum.org/docs/measure_evaluation_criteria.aspx. Last accessed April 2010.
5. Higgins TL, Teres D, Copes WS, et al., Assessing contemporary intensive care unit outcome: an updated Mortality Probability Admission Model (MPM0-III), *Crit Care Med*, 2007; 35:827–835).
6. National Cardiovascular Data Registry (NCDR). Washington, DC: NCDR. Available at www.ncdr.com. Last accessed April 2010.
7. Information regarding NQF's time-limited endorsement policy and the 2010 addendum is available at www.qualityforum.org/Measuring_Performance/Consensus_Devlopment_Process's_Principle/Consensus_Staandards_Approval_Committee_Decision.aspx.
8. Harmonization refers to the standardization of specifications for similar measures on the same topic (e.g., influenza immunization of patients in hospitals, nursing homes, etc.), related measures for the same target population (e.g., eye exam and HbA1c for patients with diabetes), or definitions applicable to many measures (e.g., age designation for children) so that they are uniform or compatible, unless differences are dictated by the evidence. The dimensions of harmonization can include numerator, denominator, exclusions, and data source and collection instructions. The extent of harmonization depends on the relationship of the various measures and the evidence for the specific measure focus, as well as differences in data sources.

9. Holland AE, Hill CJ, Rasekaba T, et al., Updating the minimal important difference for six-minute walk distance in patients with chronic obstructive pulmonary disease, *Arch Phys Med Rehabil*, 2010;91(2):221-225.
10. Naylor MD, Transitional care for older adults: a cost-effective model, *LDI Issue Brief*, 2004; 9(6):1-4.
11. Naylor MD, Feldman PH, Keating S, et al., Translating research into practice: transitional care for older adults, *J Eval Clin Pract*, 2009; 15(6):1164-1170.

# NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT
## APPENDIX A: MEASURE SPECIFICATIONS

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| OT1- 024-09 | Intensive care: in-hospital mortality rate | Philip R. Lee Institute for Health Policy Studies,University of California San Francisco, 3333 California Street, Suite 265, San Francisco, California 94118 | For all adult patients admitted to the intensive care unit (ICU), the percentage of patients whose hospital outcome is death; both observed and risk-adjusted mortality rates are reported with predicted rates based on the Mortality Probability Admission (MPM III) model. | Total number of eligible patients whose hospital outcome is death.<br><br>Eligible patients include those with an ICU stay of at least 4 hours and >18 years of age whose primary reason for admission does not include trauma, burns, or immediately post-coronary artery bypass graft surgery (CABG), as these patient groups are known | Total number of eligible patients who are discharged (including deaths and transfers)<br><br>Eligible patients include those with an ICU stay of at least 4 hours and >18 years of age whose primary reason for admission does not include trauma, burns, or immediately post-coronary artery bypass graft surgery (CABG), | <18 years of age at time of ICU admission, ICU readmission, <4 hours in ICU, primary admission due to trauma, burns, or immediately post-CABG, admitted to exclude myocardial infarction (MI) and subsequently found without MI or any other acute process requiring ICU care<br><br><18 years of age at time of ICU | Pharmacy data, documentation of original self-assessment | Clinicians: Group, Clinicians: Other |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | to require unique risk-adjustment. Only index (initial) ICU admissions are recorded given that patient characteristics of readmissions are known to differ. | as these patient groups are known to require unique risk-adjustment. Only index (initial) ICU admissions are recorded given that patient characteristics of readmissions are known to differ. | admission (with time of ICU admission abstracted preferably from ICU vital signs flowsheet), ICU readmission (i.e. not the patient's first ICU admission during the current hospitalization), <4 hours in ICU, primary admission due to trauma, burns, or immediately post-CABG, admitted to exclude myocardial | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | infarction (MI) and subsequently found without MI or any other acute process requiring ICU care<br><br>Adjustments: risk-adjustment devised specifically for this measure/condition Risk-adjustment variables include: age, heart rate >=150, SBP <=90, chronic renal, acute renal, GIB, cardiac arrhythmia, | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | intracranial mass effect, mechanical ventilation, received CPR, cancer, cerebrovascular incident, cirrhosis, coma, status post elective surgery, zero factor status (no risk factors other than age), and full code status (no restrictions on therapies or interventions at the time of ICU admission). The risk-adjustment | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | model is based on the MPM III (mortality probability model) with coefficients customized for the population of interest. | | |
| OT1-023-09 | Intensive care unit (ICU) length-of-stay (LOS) | Philip R. Lee Institute for Health Policy Studies, University of California San Francisco, 3333 California Street, Suite 265, San | For all patients admitted to the ICU, total duration of time spent in the ICU until time of discharge; both observed and risk-adjusted LOS reported with the predicted LOS | For all eligible patients admitted to the ICU, the time at discharge from ICU (either death or physical departure from the unit) minus the time of admission (first recorded vital sign on ICU flow | Total number of eligible patients who are discharged (including deaths and transfers)<br><br>Eligible patients include those with an ICU stay of at least 4 hours and >18 years of age | <18 years of age at time of ICU admission, ICU readmission, <4 hours in ICU, primary admission due to trauma, burns, or immediately post-CABG, admitted to exclude myocardial | Pharmacy data, documentation of original self-assessment | Clinicians: Group, Clinicians: Other |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | Francisco, California 94118 | measured using a adjustment model based on the (Mortality Probability Model) MPM III | sheet)<br><br>Eligible patients include those with an ICU stay of at least 4 hours and >18 years of age whose primary reason for admission does not include trauma, burns, or immediately post-coronary artery bypass graft surgery (CABG), as these patient groups are known to require unique risk-adjustment. Only index | whose primary reason for admission does not include trauma, burns, or immediately post-coronary artery bypass graft surgery (CABG), as these patient groups are known to require unique risk-adjustment. Only index (initial) ICU admissions are recorded given that patient characteristics of readmissions are known to differ. | infarction (MI) and subsequently found without MI or any other acute process requiring ICU care<br><br><18 years of age at time of ICU admission (with time of ICU admission abstracted preferably from ICU vital signs flowsheet), ICU readmission (i.e. not the patient's first ICU admission during the current | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | (initial) ICU admissions are recorded given that patient characteristics of readmissions are known to differ. | | hospitalization), <4 hours in ICU, primary admission due to trauma, burns, or immediately post-CABG, admitted to exclude myocardial infarction (MI) and subsequently found without MI or any other acute process requiring ICU care<br><br>Adjustments: risk-adjustment devised specifically for this | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | measure/condition Risk-adjustment variables include: age, heart rate >=150, SBP <=90, chronic renal, acute renal, GIB, cardiac arrhythmia, intracranial mass effect, mechanical ventilation, received CPR, cancer, cerebrovascular incident, cirrhosis, coma, status post elective surgery, zero factor status (no risk factors | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | other than age), and full code status (no restrictions on therapies or interventions at the time of ICU admission). The LOS risk-adjustment model is based on the MPM III (mortality probability model) with coefficients customized for the population of interest. | | |
| OT1-007-09 | Hospital risk-standardized | Centers for Medicare & | This measure provides | This outcome measure does not | The target population for this | We are using this field to define | Electronic adminstrative | Population: national, |

# NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT
# APPENDIX A: MEASURE SPECIFICATIONS

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | complication rate following implantation of implantable cardioverter-defibrillator (ICD) | Medicaid Services (CMS), 7500 Security Boulevard, Baltimore, Maryland 21244 | hospital specific risk-standardized rates of procedural complications following the implantation of an ICD in Medicare Fee-For-Service (FFS) patients at least 65 years of age. The measure uses clinical data available in the National Cardiovascular Data Registry (NCDR) ICD | have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we are using this field to define the outcome (ie adverse events) following ICD implantation. The measured outcome for each index admission | measure includes inpatient or outpatient ICD implants for Medicare fee-for-service (FFS) beneficiaries at least 65 years of age at the time of implantation who have matching information in the National Cardiovascular Disease Registry (NCDR) ICD Registry. The patient cohort is defined by ICD-9 procedures codes from | exclusions to the patient cohort: (1) Non Medicare fee-for-service patients on the first day of the patient stay. Rationale: Outcome data are being derived only for Medicare fee-for-service patients. (2) Not the first claim in the same claim bundle. When several claims in the same hospital representing the same patient stay | data/claims, Survey: Patient | Facility/Agency |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | Registry for risk adjustment that has been linked with CMS administrative claims data used to identify procedural complications. | is one or more complications or mortality within 30 or 90 days (depending on the complication) following ICD implantation. Complications are counted in the measure only if they occur during a hospital admission.<br><br>Complications are identified using International Classification of Diseases, 9th Revision, Clinical | inpatient claims and Healthcare Common Procedure Coding System/Current Procedural Terminology (HCPCS/CPT) procedure codes from outpatient claims as outlined in the denominator details.<br><br>Complications are identified using International Classification of Diseases, 9th Revision, Clinical | exist in the data together (bundled), any claim other than the first in such a bundle is excluded. Rationale: Inclusion of these patients could result in duplicate counting in the measure. (3)Patient stays which lack 90-days of Medicare fee-for-service enrollment post discharge. Patients who cannot be tracked | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | Modification (ICD-9-CM) diagnosis and procedure codes as well as the Medicare Enrollment Database (vital status) as indicated below: Complications measured for 30 days: (1) Pneumothorax or hemothorax plus a chest tube Definition: (a) Pneumothorax / hemothorax: 512.1 or 511.8 (diagnosis code) | Modification (ICD-9-CM) diagnosis and procedure codes as well as the Medicare Enrollment Database (vital status) as indicated below: Complications measured for 30 days: (1) Pneumothorax or hemothorax plus a chest tube Definition: (a) Pneumothorax / hemothorax: 512.1 or 511.8 (diagnosis code) | for 90 days following discharge are excluded. Rationale: There will not be adequate follow-up data to assess complications. (4)Previous ICD placement. Patient stays in which the patient had an ICD implanted prior to the index hospital stay are excluded. Rationale: Ideally, the measure would include patients with a | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | (b) Chest tube: 34.04, 34.05, 34.06, or 34.09 (procedure code) (2) Hematoma plus a blood transfusion or evacuation Definition: (a) Hematoma: 998.1 (diagnosis code) (b) Blood transfusion: 518.7, 287.4, V59.01, V58.2 (diagnosis code), or 99.00, 99.03, 99.04 (procedure code); Evacuation: 34.04, 34.09 | (b) Chest tube: 34.04, 34.05, 34.06, or 34.09 (procedure code) (2) Hematoma plus a blood transfusion or evacuation Definition: (a) Hematoma: 998.1 (diagnosis code) (b) Blood transfusion: 518.7, 287.4, V59.01, V58.2 (diagnosis code), or 99.00, 99.03, 99.04 (procedure code); Evacuation: 34.04, 34.09 | prior ICD, as this is a population known to be at high risk of adverse outcomes. However, for these patients it is difficult to distinguish in the administrative data whether adverse events such as infection were complications of the second ICD placement or were present on admission. The indications for reimplantation | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | (procedure code)<br>(3) Cardiac tamponade or pericardiocentesis<br>Definition: (a) Cardiac tamponade: 420, 423.0, 423.3, 423.9 (diagnosis code), or 37.0, 37.12 (procedure code)<br>(4) Death<br>Source: Medicare enrollment database<br>Complications measured for 90 days<br>(5) Mechanical complications | (procedure code)<br>(3) Cardiac tamponade or pericardiocentesis<br>Definition: (a) Cardiac tamponade: 420, 423.0, 423.3, 423.9 (diagnosis code), or 37.0, 37.12 (procedure code)<br>(4) Death<br>Source: Medicare enrollment database<br>Complications measured for 90 days<br>(5) Mechanical complications | include events included in our definition of procedural complications such as device infection, device malfunction, or lead dislodgement. Given current coding practices, we are unable to determine whether a 'complication' code is present on admission or in fact represents a procedural complication. In | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | requiring a system revision<br>Definition: (a) Mechanical complications with system revision: 996.0 (diagnosis code)<br>(b) System revision: 37.75, 37.79, 37.97, 37.99, or 00.52(procedure code)<br>(6) Device related infection<br>Definition: (a) Infection: 996.61 (diagnosis code)<br>(7) Additional ICD implantation | requiring a system revision<br>Definition: (a) Mechanical complications with system revision: 996.0 (diagnosis code)<br>(b) System revision: 37.75, 37.79, 37.97, 37.99, or 00.52(procedure code)<br>(6) Device related infection<br>Definition: (a) Infection: 996.61 (diagnosis code)<br>(7) Additional ICD implantation | order to avoid misclassification, we exclude these patients from the measure.<br><br>See above. We are deriving the corresponding codes based on the data for exclusion.<br><br>Adjustments: risk-adjustment devised specifically for this measure/condition We developed a risk adjustment | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | Definition: (a) Inpatient or outpatient ICD implantation: 00.50, 00.51, 00.52, 00.53, 00.54, or 37.94 (procedure codes) (b) Outpatient ICD implantation: 33216, 33217, 33218, 33220,33223, 33240, 33241, or 33249 (CPT codes) | Definition: (a) Inpatient or outpatient ICD implantation: 00.50, 00.51, 00.52, 00.53, 00.54, or 37.94 (procedure codes) (b) Outpatient ICD implantation: 33216, 33217, 33218, 33220,33223, 33240, 33241, or 33249 (CPT codes) | model for the measure and calculated hospital 30-day risk-standardized complication rates (RSCRs) using hierarchical regression. Because of the natural clustering of the observations within hospitals, we estimated hierarchical generalized linear models (HGLMs). These models extend generalized linear | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | models (GLMs) to include additional random terms in the linear predictor.<br>As described in the "Calculation Algorithm," we perform risk adjustment to account for differences in patient severity present before the implantation of the ICD using a hierarchical logistic regression model to calculate RSCRs. The risk adjustment | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | variables are abstracted from the NCDR ICD Registry data. We used logistic regression with stepwise selection (entry $p<0.15$; retention with $p<0.05$) for variable selection. We also assessed the direction and magnitude of the regression coefficients. This resulted in a final risk-adjusted complications model that included 13 | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | variables. The final risk adjustment variables include: Demographic<br>(1) Age (10 year increments)<br>(2) Female Admission<br>(3) Hospital Reason<br>Admitted for this procedure<br>Hospitalized: Cardiac<br>Hospitalized: Non-Cardiac History and Risk Factors<br>(4) New York Heart Association | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (NYHA) Class: Current Status<br>NYHA I<br>NYHA II<br>NYHA III<br>NYHA IV<br>(5) Previous Coronary Artery Bypass Graft (CABG)<br>(6) Chronic Lung Disease<br>(7) Hypertension<br>(8) Renal Failure- Dialysis Diagnostics<br>(9) Atrioventricular Conduction (AVC)<br>AVC: Normal | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | AVC: Abnormal- First Degree Heart Block Only<br>AVC: Abnormal- 2nd/3rd Degree Heart Block<br>AVC: Paced (any)<br>(10) BUN > 30 mg/dl<br>(11) Sodium<br><135 mg/dl<br>135 to 145 mg/dl<br>>145 mg/dl<br>(12) Systolic Blood Pressure < 100mmHG<br>(13) ICD Type<br>Single Chamber | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Dual Chamber Biventricular | | |
| OT1-008-09 | Hospital 30-day risk-standardized readmission rates following percutaneous coronary intervention (PCI) | Centers for Medicare & Medicaid Services (CMS), 7500 Security Boulevard, Baltimore, Maryland 21244 | This measure estimates hospital risk-standardized 30-day readmission rates following PCI in Medicare Fee for Service (FFS) patients at least 65 years of age. As PCI patients may be readmitted electively for staged revascularization procedures, we will exclude such elective | This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we are using this field to define readmissions. The outcome for this measure is | The target population for this measure includes inpatient or outpatient PCI procedures for Medicare FFS beneficiaries at least 65 years of age at the time of the procedure who have matching information in the National Cardiovascular Disease Registry (NCDR) CathPCI Registry. | Note: We are using this field to define exclusions to the patient cohort.<br>(1) PCIs for patients who are not Medicare FFS beneficiaries on admission<br>Rationale: Patients not enrolled in Medicare FFS at the start of the episode of care are excluded as readmission information is | Electronic adminstrative data/claims, Survey: Patient | Population: national, Facility/Agency |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | readmissions from the measure. The measure uses clinical data available in the National Cardiovascular Disease Registry (NCDR) CathPCI Registry for risk adjustment that has been linked with the CMS administrative claims data used to identify readmissions. | 30-day all-cause readmission. We define a readmission as a subsequent hospital inpatient admission within 30 days of either the discharge date of an admission with PCI (for admitted patients) or the outpatient PCI claim end date (for patients whose PCI was performed as an outpatient service).<br><br>In the CathPCI | The patient cohort is defined by International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) procedure codes for both inpatient and outpatient claims and Current Procedural Terminology (CPT) procedure codes for outpatient claims.<br><br>In the CathPCI | currently available only for FFS patients.<br>(2) Patient stays that are not the first claim in the same claim bundle<br>Rationale: Multiple claims from an individual hospital can be bundled together. In order to ensure that the selected PCI is the index PCI, those PCI procedures that were not the first claim in a specific | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | Registry, admissions are identified with field 614 (PCI=Yes). We do not count readmissions associated with a 'staged' revascularization procedure. Staged readmissions are not counted in this measure as readmissions (some patients have planned readmissions for revascularization procedures – for example, to | Registry, admissions are identified with field 614 (PCI=Yes). We do not count readmissions associated with a 'staged' revascularization procedure. Staged readmissions are not counted in this measure as readmissions (some patients have planned readmissions for revascularization procedures – for example, to | bundle are excluded. (3) The PCI is not performed within 10 days of admission Rationale: Patients who have a PCI after many days of hospitalization are rare and represent a distinct population that likely has risk factors for readmission related to the hospitalization that are not well quantified in the | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | perform PCI on a second vessel or a second location in the same vessel, or to perform coronary artery bypass graft (CABG) surgery after AMI and a period of recovery outside the hospital). Because admissions for PCI and CABG may be staged or scheduled readmissions, we do not count as readmissions those admissions after discharge | perform PCI on a second vessel or a second location in the same vessel, or to perform coronary artery bypass graft (CABG) surgery after AMI and a period of recovery outside the hospital). Because admissions for PCI and CABG may be staged or scheduled readmissions, we do not count as readmissions those admissions after discharge | registry. It seems clinically sensible to exclude these patients.<br>(4) The patient is transferred out<br>Rationale: Patient stays in which the patient received a PCI and was then transferred to another hospital are excluded as the hospital that performed the PCI procedure does not provide discharge care and cannot be fairly held responsible for | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | that include PCI or CABG procedures unless the principal discharge diagnosis for the readmission is one of the following diagnoses (which are not consistent with a scheduled readmission): heart failure (HF), acute myocardial infarction (AMI), unstable angina, arrhythmia, and cardiac arrest (i.e., readmissions with these | that include PCI or CABG procedures unless the principal discharge diagnosis for the readmission is one of the following diagnoses (which are not consistent with a scheduled readmission): heart failure (HF), acute myocardial infarction (AMI), unstable angina, arrhythmia, and cardiac arrest (i.e., readmissions with these | their outcomes following discharge.<br>(5) The patient dies during hospitalization<br>Rationale: Subsequent admissions (readmissions) are not possible.<br>(6) The patient leaves against medical advice (AMA)<br>Rationale: Hospitals and physicians do not have the opportunity to provide highest | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | diagnoses and a PCI or CABG procedure are counted as readmissions. | diagnoses and a PCI or CABG procedure are counted as readmissions. | quality care.<br>(7) The patient lacks a full month of follow-up in the Medicare program<br>Rationale: Patient stays that cannot be tracked for the full 30-day follow-up period do not provide adequate information to determine readmissions.<br>(8) A subsequent admission with PCI within 30-days of an index admission | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Rationale: A subsequent readmission for PCI within 30 days of the index PCI cannot be considered an index hospital stay; it is a readmission.<br><br>See above. We are deriving the corresponding codes based on the data for exclusion.<br><br>Adjustments: risk-adjustment devised | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | specifically for this measure/condition We developed a risk adjustment model for the measure and calculate hospital 30-day risk-standardized readmission rates (RSRRs) using hierarchical logistic regression. Because of the natural clustering of the observations within hospitals, we estimated | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | hierarchical generalized linear models (HGLMs). These models extend generalized linear models (GLMs) to include random effect on the intercept in the models.<br>As described in the "Calculation Algorithm," we perform risk adjustment to account for differences in patient severity present before the performance of | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | the PCI using a hierarchical logistic regression model to calculate RSRRs. The risk adjustment variables are abstracted from the CathPCI Registry data. We used logistic regression with stepwise selection (entry $p<0.05$; retention with $p<0.01$) for variable selection. We also assessed the direction and magnitude of the regression | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | coefficients. This resulted in a final risk-adjusted readmission model that included 20 variables. The final risk adjustment variables include: Demographic<br>(1) Age (10 year increments)<br>(2) Female<br>History and Risk Factors<br>(3) Body Mass Index<br>(4) Heart failure-previous history<br>(5) Previous | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | valvular surgery<br>(6) Cerebrovascular Disease<br>(7) Peripheral Vascular Disease<br>(8) Chronic Lung Disease<br>(9) Diabetes<br>None<br>Non-Insulin Diabetes<br>Insulin Diabetes<br>(10) Glomerular Filtration Rate (GFR)<br>Not Measured<br>GFR<30<br>30=GFR<60<br>60=GFR<90<br>GFR=90 | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (11) Renal Failure – dialysis<br>(12) Hypertension<br>(13) History of tobacco use<br>(14) Previous PCI<br>Cardiac Status<br>(15) Heart failure – current status<br>(16) Symptoms present on admission<br>No MI<br>MI within 24 hours<br>MI after 24 hours<br>Cath Lab Visit<br>(17) Ejection | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Fraction (EF)<br>Percentage<br>Not Measured<br>EF<30<br>30=EF<45<br>EF=45<br>PCI Procedure<br>(18) PCI status<br>Elective<br>Urgent<br>Emergency<br>Salvage<br>(19) Highest Risk Lesion – location<br><br>pRCA/mLAD/pCIRC<br>pLAD<br>Left main<br>Other<br>(20) Highest pre- | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | | | procedure TIMI flow: none | | |
| OT1-016-09 | 30-day Post-Hospital Acute Myocardial Infarction (AMI) Discharge Care Transition Composite Measure | Brandeis University/CMS, 415 South St., Waltham, MA 02454 | This measure scores a hospital on the incidence among its patients during the month following discharge from an inpatient stay having a primary diagnosis of heart failure for three types of events: readmissions, ED visits and evaluation and management | The numerator is the weighted sum of the three deviations from their expected values for the individual measures comprising the component measure. The question of appropriate weights on the deviations is difficult and would probably lead to a wide variation in | The composite measure is the weighted sum of three individual measures. Thus, the denominator is one. | N/A | Electronic administrative data/claims | National |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | (E&M) services.<br><br>These events are relatively common, measurable using readily available administrative data, and associated with effective coordination of care after discharge. The input for this score is the result of measures for each of these | opinion. The weights of -4, -2, and 1 are selected to represent order of magnitude differences in seriousness of the three outcomes, which most would agree to (that is to say: readmission is more important than ED which is more important in a negative way than E & M service is in a positive way). The idea of not using weights was also considered, | | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | three events that are being submitted concurrently under the Patient Outcomes Measures Phase I project's call for measures (ED and E&M) or is already approved by NQF (readmissions). Each of these individual measures is a risk-adjusted, standardized rate together | but this was noted to be itself a de facto weight scheme (with all weights the same), and as such, a weight scheme that was less appropriate than the one chosen. | | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | with a percentile ranking. This composite measure is a weighted average of the deviations of the three risk-adjusted, standardized rates from the population mean for the measure across all patients in all hospitals. Again, the composite measure is accompanied by | | | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | a percentile ranking to help with its interpretation. | | | | | |
| OT1-017-09 | 30-Day post-hospital heart failure (HF) discharge care transition composite measure | Brandeis University, CMS, 415 South St. Waltham, MA 02454 | This measure scores a hospital on the incidence among its patients during the month following discharge from an inpatient stay having a primary diagnosis of heart failure for three types of events: readmissions, ED visits and | The numerator is the weighted sum of the three deviations from their expected values for the individual measures comprising the component measure. The question of appropriate weights on the deviations is difficult and would probably | The composite measure is the weighted sum of three individual measures. Thus, the denominator is one. | N/A | Electronic administrative data/claims | National |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | evaluation and management (E&M) services.<br><br>These events are relatively common, measurable using readily available administrative data, and associated with effective coordination of care after discharge. The input for this score is the result of | lead to a wide variation in opinion. The weights of -4, -2, and 1 are selected to represent order of magnitude differences in seriousness of the three outcomes, which most would agree to (that is to say: readmission is more important than ED which is more important in a negative way than E & M service is in a positive way). The idea of not | | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | measures for each of these three events that are being submitted concurrently under the Patient Outcomes Measures Phase I project's call for measures (ED and E&M) or is already approved by NQF (readmissions). Each of these individual measures is a risk-adjusted, | using weights was also considered, but this was noted to be itself a de facto weight scheme (with all weights the same), and as such, a weight scheme that was less appropriate than the one chosen. | | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | standardized rate together with a percentile ranking. This composite measure is a weighted average of the deviations of the three risk-adjusted, standardized rates from the population mean for the measure across all patients in all hospitals. Again, the composite | | | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | measure is accompanied by a percentile ranking to help with its interpretation. | | | | | |
| OT1-029-09 | Health-related quality of life in COPD patients before and after pulmonary rehabilita-tion | American Association of Cardiovascular and Pulmonary Rehabilitation, 401 N. Michigan Avenue, Suite 2200, Chicago, Illinois 60611 | The percentage of patients with COPD enrolled in pulmonary rehabilitation (PR) who are found to increase their health-related quality of life score (HRQOL). | Number of patients with clinician diagnosed COPD who have participated in PR and have been found to increase their HRQOL score by 1.0 points, as measured by the Chronic Respiratory Disease | All patients with COPD, during the reporting period, who are enrolled in a PR program.<br><br>To perform the HRQOL assessment, a CRQ is administered by PR staff to each COPD patient enrolled in PR, in a private | Inability to read and/or write in order to complete the self-administered CRQ, or presence of cognitive or neuropsychiatric impairment that impairs the patient's ability to answer the CRQ (or similar tool).<br><br>Patients enrolled | external audit, Documentation of original self-assessment, Management data | Population: regional/network, Clinicians: Group, Program: Other |

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|---|---|---|---|---|---|---|---|---|
| | | | | Questionnare (CRQ), or a similar tool, at the beginning and the end of PR.<br><br>To perform the HRQOL assessment, a CRQ is administered by PR staff to each COPD patient enrolled in PR, in a private interview space. The numerator is calculated as follows: A patient is counted as having | interview space. The numerator is calculated as follows: A patient is counted as having increased his/her HRQOL score (measured by CRQ) if the HRQOL score at PR program completion is at least 1.0 points higher than the HRQOL score at PR program entry.<br>The Chronic Respiratory Disease | in PR are to be excluded if he/she is unable to read and/or write, or who have significant cognitive or neuropsychiatric impairment that would preclude ability to answer the CRQ (or similar tool).<br><br>Adjustments:<br>no risk adjustment necessary<br>Not applicable | | |

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|---|---|---|---|---|---|---|---|---|
| | | | | increased his/her HRQOL score (measured by CRQ) if the HRQOL score at PR program completion is at least 1.0 points higher than the HRQOL score at PR program entry.<br>The Chronic Respiratory Disease Questionnaire provides a composite score of the patient's perception of their current health | Questionnaire provides a composite score of the patient's perception of their current health status and impact on daily life.<br>The Chronic Respiratory Disease Questionnaire is a 20 item interview instrument that measures patient perceptions of dyspnea, fatigue, emotional function, and mastery. The CRQ uses a 7- | | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | status and impact on daily life. The Chronic Respiratory Disease Questionnaire is a 20 item interview instrument that measures patient perceptions of dyspnea, fatigue, emotional function, and mastery. The CRQ uses a 7-point numeric Likert-type scale. A change in the score of 0.5 on the 7 point scale, reflects a clinical | point numeric Likert-type scale. A change in the score of 0.5 on the 7 point scale, reflects a clinical significant small change (Redelmeier, et al. 1996; Jaeschke, et al., 1989). A change of 1.0 reflects a moderate change. Reliability and validity have been reported in multiple studies (Martin, 1994; Guyatt, et al. 1987). | | | |

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|---|---|---|---|---|---|---|---|---|
| | | | | significant small change (Redelmeier, et al. 1996; Jaeschke, et al., 1989). A change of 1.0 reflects a moderate change. Reliability and validity have been reported in multiple studies (Martin, 1994; Guyatt, et al. 1987). Martin LL. Validity and reliability of a quality-of-life instrument. The chronic | Martin LL. Validity and reliability of a quality-of-life instrument. The chronic respiratory disease questionnaire. Clin Nurs Res 1994;3:146-156. Guyatt GH, Berman LB, Townsend M, Puglsey SO, Chambers LW. A measure of quality of life for clinical trials in chronic lung disease. Thorax | | | |

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|---|---|---|---|---|---|---|---|---|
| | | | | respiratory disease questionnaire. Clin Nurs Res 1994;3:146-156. Guyatt GH, Berman LB, Townsend M, Puglsey SO, Chambers LW. A measure of quality of life for clinical trials in chronic lung disease. Thorax 1987;42:773-778. Redelmeier DA, Guyatt GH, Goldstein RS. Assessing the minimal | 1987;42:773-778. Redelmeier DA, Guyatt GH, Goldstein RS. Assessing the minimal important difference in symptoms: a comparison of two techniques. J Clin Epidemiol 1996;49:1215-1219. Jaeschke R, Singer J, Guyatt GH. Measurement of health status ascertaining the minimal clinically important | | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | important difference in symptoms: a comparison of two techniques. J Clin Epidemiol 1996;49:1215-1219. Jaeschke R, Singer J, Guyatt GH. Measurement of health status ascertaining the minimal clinically important difference. Controlled Clin Trials 1989;10:407-415. | difference. Controlled Clin Trials 1989;10:407-415. | | | |
| OT1-020-09 | Functional capacity in | American Association | The percentage of patients with | Number of patients with | All patients with COPD, during the | Patients who are unable to perform | Management data, pharmacy | Population: |

# NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT
## APPENDIX A: MEASURE SPECIFICATIONS

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

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|---|---|---|---|---|---|---|---|---|
| | COPD patients before and after pulmonary rehabilitation | for Cardiovascular and Pulmonary Rehabilitation, 401 N. Michigan Avenue, Suite 2200, Chicago, Illinois 60611 | COPD who are enrolled in pulmonary rehabilitation (PR) who are found to increase their functional capacity by at least 54 meters (176 feet), as measured by a standardized 6 minute walk test (6MWT). | clinician diagnosed COPD who have participated in PR and have been found to increase their functional capacity by at least 54 meters (176 feet), as measured by 6MWT distance at the beginning and the end of PR.<br><br>To perform the 6 minute walk test (6MWT) the patient is instructed to walk | reporting period, who are enrolled in a pulmonary rehabilitation program.<br><br>To perform the 6 minute walk test (6MWT) the patient is instructed to walk as fast and as far as they can in 6 minutes, but they are allowed to stop and rest during the test, if needed. The total distance covered in 6 minutes is measured (in | a 6MWT for health and/or safety reasons, and those who have not completed at least 10 PR sessions within 3 months of program entry.<br><br>Absolute contraindications for the 6MWT include the following: unstable angina during the previous month and myocardial infarction during the previous | data, Documentation of original self-assessment | regional/network, Program: Other |

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|---|---|---|---|---|---|---|---|---|
| | | | | as fast and as far as they can in 6 minutes, but they are allowed to stop and rest during the test, if needed. The total distance covered in 6 minutes is measured (in meters or feet). The numerator is calculated by the following formula: A patient is counted as having experienced a significant increase in functional | meters or feet). The numerator is calculated by the following formula: A patient is counted as having experienced a significant increase in functional capacity if (6MWT distance at program completion - 6MWT distance at program entry)>= 54 meters (176 feet). The 6 minute walk test | month. Relative contraindications include a resting heart rate of more than 120, a systolic blood pressure of more than 180 mm Hg, and a diastolic blood pressure of more than 100 mm Hg. Additional exclusion criteria include significant orthopedic, neurological, cognitive or psychiatric impairment. | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | capacity if (6MWT distance at program completion - 6MWT distance at program entry)>= 54 meters (176 feet). The 6 minute walk test (6MWT) is a practical, simple, standardized, and validated test that measures the distance that a patient can quickly walk on a flat, hard surface in a period of 6 minutes (6MWD). | (6MWT) is a practical, simple, standardized, and validated test that measures the distance that a patient can quickly walk on a flat, hard surface in a period of 6 minutes (6MWD). It evaluates the global and integrated responses of all the systems involved during exercise, including the pulmonary and cardiovascular | Adjustments: no risk adjustment necessary Not applicable | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | It evaluates the global and integrated responses of all the systems involved during exercise, including the pulmonary and cardiovascular systems, systemic circulation, peripheral circulation, blood, neuromuscular units, and muscle metabolism. The 6MWT provides specific testing related to the activity of daily | systems, systemic circulation, peripheral circulation, blood, neuromuscular units, and muscle metabolism. The 6MWT provides specific testing related to the activity of daily living, walking.(Guyatt, G.H., et al., 1984. Guyatt, G.H., et al., 1985, Sciurba, F.C. and W.A. Slivka, Steele, B). In performing the 6MWT, it has been reported that | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | living, walking.(Guyatt, G.H., et al., 1984. Guyatt, G.H., et al., 1985, Sciurba, F.C. and W.A. Slivka, Steele, B). In performing the 6MWT, it has been reported that a 54 meter (176 feet) difference in 6MW difference is clinically significant (identified as clear change in clinical status) when compared to differences in self-rating of | a 54 meter (176 feet) difference in 6MW difference is clinically significant (identified as clear change in clinical status) when compared to differences in self-rating of walking ability (Redelmeier, D.A., et al). The strongest indication for the 6MWT is for measuring the response to medical interventions in | | | |

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|---|---|---|---|---|---|---|---|---|
| | | | | walking ability (Redelmeier, D.A., et al). The strongest indication for the 6MWT is for measuring the response to medical interventions in patients with moderate to severe heart or lung disease. Specific instructions regarding the administration of the 6MWT have been developed and published by | patients with moderate to severe heart or lung disease. Specific instructions regarding the administration of the 6MWT have been developed and published by the American Thoracic Society (ATS, 2002). COPD (chronic obstructive pulmonary disease includes a clinician diagnosis of COPD, chronic | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | the American Thoracic Society (ATS, 2002). COPD (chronic obstructive pulmonary disease includes a clinician diagnosis of COPD, chronic bronchitis and / or emphysema (ICD-9 Codes include 490-492, 494, 496: Chronic obstructive pulmonary disease (COPD) includes chronic bronchitis (ICD-9 | bronchitis and / or emphysema (ICD-9 Codes include 490-492, 494, 496: Chronic obstructive pulmonary disease (COPD) includes chronic bronchitis (ICD-9 codes 490-491), emphysema (ICD-9 code 492),bronchiectasis (ICD-9 code 494), and chronic airway obstruction (ICD-9 code 496). These diseases are | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | codes 490-491), emphysema (ICD-9 code 492),bronchiectasis (ICD-9 code 494), and chronic airway obstruction (ICD-9 code 496). These diseases are commonly characterized by irreversible airflow limitation. Guyatt, G.H., et al., Effect of encouragement on walking test performance. Thorax, 1984. 39(11): p. 818-22. | commonly characterized by irreversible airflow limitation. Guyatt, G.H., et al., Effect of encouragement on walking test performance. Thorax, 1984. 39(11): p. 818-22. Guyatt, G.H., et al., The 6-minute walk: a new measure of exercise capacity in patients with chronic heart failure. Canadian Medical Association | | | |

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

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|---|---|---|---|---|---|---|---|---|
| | | | | Guyatt, G.H., et al., The 6-minute walk: a new measure of exercise capacity in patients with chronic heart failure. Canadian Medical Association Journal, 1985. 132(8): p. 919-23. Redelmeier, D.A., et al., Interpreting small differences in functional status: the six minute walk test in chronic lung disease patients. American Journal | Journal, 1985. 132(8): p. 919-23. Redelmeier, D.A., et al., Interpreting small differences in functional status: the six minute walk test in chronic lung disease patients. American Journal of Respiratory and Critical Care Medicine, 1997. 155: p. 1278-1282. Sciurba, F.C. and W.A. Slivka, Six minute walk testing. Seminars in Respiratory and | | | |

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| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | of Respiratory and Critical Care Medicine, 1997. 155: p. 1278-1282.<br>Sciurba, F.C. and W.A. Slivka, Six minute walk testing. Seminars in Respiratory and Critical Care Medicine, 1998. 19(4): p. 383-392.<br>Steele, B., Timed walking tests of exercise capacity in chronic cardiopulmonary illness. Journal of Cardiopulmonary Rehabilitation, | Critical Care Medicine, 1998. 19(4): p. 383-392.<br>Steele, B., Timed walking tests of exercise capacity in chronic cardiopulmonary illness. Journal of Cardiopulmonary Rehabilitation, 1996. 16: p. 25-33. | | | |

# NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT
# APPENDIX A: MEASURE SPECIFICATIONS

The following table presents the detailed specifications for the proposed consensus standards. All information presented has been derived directly from measures developers without modification or alteration (except where measure developers agreed to such modifications) and is current as of April 13, 2010. All proposed voluntary consensus standards are open source, meaning they are fully accessible and disclosed. Measures were developed by the Phillip R. Lee Institute for Health Policy Studies at the University of California at San Francisco; Yale University, Brandeis University; the Center for Medicare and Medicaid Services (CMS); and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR).

| Measure Number | Measure Title | Measure Steward | Measure Description | Numerator | Denominator | Exclusions / Adjustments | Data Source | Level of Analysis |
|---|---|---|---|---|---|---|---|---|
| | | | | 1996. 16: p. 25-33. | | | | |

**National Voluntary Consensus Standards for Patient Outcomes**

**Appendix B—Main Steering Committee**

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Rehabilitation Institute of Chicago, Chicago, IL

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Connecticut Hospital Association, Wallingford, CT

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Texas Health Resources, Arlington, TX

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University of Washington School of Medicine, Seattle, WA

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University of California, Irvine, Irvine, CA

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Association of perioperative Registered Nurses, Denver, CO

**Patricia K. Haugen**

National Breast Cancer Coalition, Sioux Falls, SD

**David Herman, MD**

Mayo Clinic, Rochester, MN

**David S. P. Hopkins, MS, PhD**

Pacific Business Group on Health, San Francisco, CA

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Virginia Commonwealth University, Richmond, VA

**David A. Johnson, MD**

American College of Gastroenterology, Norfolk, VA

**Iver Juster, MD**

ActiveHealth Management, Sausalito, CA

**Burke Kealey, MD, FHM**

HealthPartners, Minneapolis, MN

**Pauline McNulty, PhD**

Johnson & Johnson Pharmaceutical Services, LLC, Raritan, NJ

**Lee Newcomer, MD, MHA**

United HealthCare, Edina, MN

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Henry Ford Health System, Detroit, MI

**Amy K. Rosen, PhD**

Boston University School of Public Health, Bedford, MA

**Barbara J. Turner, MD, MSED, MA**

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**Barbara Yawn, MD**

Olmstead Medical Center, Rochester, MN

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# NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT

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Duke University Medical Center, Durham, NC

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Memorial Family Medicine Residency Program, Sugarland, TX

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Cleveland Clinic, Cleveland, OH

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Cleveland Clinic, Cleveland, OH

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University of Michigan Medical Center, Ann Arbor, MI

**Michael W. Rich, MD**

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**Anton N. Sidawy, MD**

Veterans Affairs Medical Center, McLean, VA

**Sarah Spinler, PharmD**

University of the Sciences in PA, Philadelphia, PA

# NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR PATIENT OUTCOMES, FIRST REPORT FOR PHASES 1 AND 2: A CONSENSUS REPORT

## Pulmonary Technical Advisory Panel


**Barbara Yawn, MD (Chair)**

Olmstead Medical Center, Rochester, MN

**Michael Lewis, MD**

Cedars-Sinai Medical Center, Los Angeles, CA

**Mark Millard, MD**

Baylor Health Care System, Dallas, TX

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Harborview Medical Center, Seattle, WA

**Richard D. O'Connor, MD**

Sharp Rees-Stealy Medical Group, San Diego, CA

## NATIONAL QUALITY FORUM

## APPENDIX C: NQF-ENDORSED® OUTCOMES MEASURES as of APRIL 2010

| NQF # | TITLE | STEWARD |
|---|---|---|
| **Cross-cutting Measures** | | |
| 541 | Proportion of days covered (PDC): 5 rates by therapeutic category | NCQA |
| 542 | Adherence to chronic medications | CMS |
| 22 | Drugs to be avoided in the elderly: a. Patients who receive at least one drug to be avoided, b. Patients who receive at least two different drugs to be avoided | NCQA |
| 138 | Urinary catheter-associated urinary tract infection for intensive care unit (ICU) patients | CDC |
| 139 | Central line catheter-associated blood stream infection rate for ICU and high-risk nursery (HRN) patients | CDC |
| 140 | Ventilator-associated pneumonia for ICU and high-risk nursery (HRN) patients | CDC |
| 141 | Patient fall rate | ANA |
| 201 | Pressure ulcer prevalence | TJC |
| 202 | Falls with injury | ANA |
| 263 | Patient burn | ASCQC |
| 265 | Hospital transfer/admission | ASCQC |
| 266 | Patient fall | ASCQC |
| 267 | Wrong site, wrong side, wrong patient, wrong procedure, wrong implant | ASCQC |
| 299 | Surgical site infection rate | CDC |
| 337 | Decubitus ulcer (PDI 2) | AHRQ |
| 344 | Accidental puncture or laceration (PDI 1) (risk adjusted) | AHRQ |
| 345 | Accidental puncture or laceration (PSI 15) | AHRQ |

| NQF # | TITLE | STEWARD |
|---|---|---|
| 346 | Iatrogenic pneumothorax (PSI 6) (risk adjusted) | AHRQ |
| 347 | Death in low mortality DRGs (PSI 2) | AHRQ |
| 348 | Iatrogenic pneumothorax in non-neonates (PDI 5) (risk adjusted) | AHRQ |
| 349 | Transfusion reaction (PSI 16) | AHRQ |
| 350 | Transfusion reaction (PDI 13) | AHRQ |
| 351 | Death among surgical inpatients with serious, treatable complications (PSI 4) | AHRQ |
| 352 | Failure to rescue in-hospital mortality (risk adjusted) | Children's Hospital of Philadelphia |
| 353 | Failure to rescue 30-day mortality (risk adjusted) | Children's Hospital of Philadelphia |
| 362 | Foreign body left after procedure (PDI 3) | AHRQ |
| 363 | Foreign body left in during procedure (PSI 5) | AHRQ |
| 364 | Incidental appendectomy in the elderly rate (IQI 24) (risk adjusted) | AHRQ |
| 367 | Post operative wound dehiscence (PDI 11) (risk adjusted) | AHRQ |
| 368 | Post operative wound dehiscence (PSI 14) (risk adjusted) | AHRQ |
| 376 | Incidence of potentially preventable VTE | TJC |
| 450 | Postoperative DVT or PE (PSI 12) | AHRQ |
| 531 | Patient safety for selected indicators | AHRQ |
| 533 | Postoperative respiratory failure (PSI #11) | AHRQ |
| 554 | Medication reconciliation post-discharge (MRP) | NCQA |
| 167 | Improvement in ambulation/locomotion | CMS |
| 171 | Acute care hospitalization (risk-adjusted) | CMS |
| 173 | Emergent care (risk adjusted) | CMS |
| 174 | Improvement in bathing | CMS |
| 175 | Improvement in bed transferring | CMS |

| NQF # | TITLE | STEWARD |
|---|---|---|
| 176 | Improvement in management of oral medications | CMS |
| 177 | Improvement in pain interfering with activity | CMS |
| 178 | Improvement in status of surgical wounds | CMS |
| 179 | Improvement in dyspnea | CMS |
| 181 | Increase in number of pressure ulcers | CMS |
| 182 | Residents whose need for more help with daily activities has increased | CMS |
| 183 | Low-risk residents who frequently lose control of their bowel or bladder | CMS |
| 184 | Residents who have a catheter in the bladder at any time during the 14-day assessment period. (risk adjusted) | CMS |
| 185 | Recently hospitalized residents with symptoms of delirium (risk-adjusted) | CMS |
| 186 | Recently hospitalized residents who experienced moderate to severe pain at any time during the 7-day assessment period | CMS |
| 187 | Recently hospitalized residents with pressure ulcers (risk adjusted) | CMS |
| 191 | Residents who lose too much weight | CMS |
| 192 | Residents who experience moderate to severe pain during the 7-day assessment period (risk-adjusted) | CMS |
| 193 | Residents who were physically restrained daily during the 7-day assessment period | CMS |
| 194 | Residents who spent most of their time in bed or in a chair in their room during the 7-day assessment period | CMS |
| 195 | Residents with a decline in their ability to move about in their room and the adjacent corridor. | CMS |
| 196 | Residents with a urinary tract infection | CMS |
| 197 | Residents with worsening of a depressed or anxious mood. | CMS |
| 198 | High-risk residents with pressure ulcers | CMS |

| NQF # | TITLE | STEWARD |
|---|---|---|
| 199 | Average-risk residents with pressure ulcers | CMS |
| 422 | Functional status change for patients with knee impairments | FOTO |
| 423 | Functional status change for patients with hip impairments | FOTO |
| 424 | Functional status change for patients with foot/ankle impairments | FOTO |
| 425 | Functional status change for patients with lumbar spine impairments | FOTO |
| 426 | Functional status change for patients with shoulder impairments | FOTO |
| 427 | Functional status change for patients with elbow, wrist or hand impairments | FOTO |
| 428 | Functional status change for patients with general orthopedic impairments | FOTO |
| 429 | Change in basic mobility as measured by the AM-PAC | CREcare |
| 430 | Change in daily activity function as measured by the AM-PAC | CREcare |
| 442 | Functional communication measure: writing | American Speech-Language-Hearing Association |
| 443 | Functional communication measure: swallowing | American Speech-Language-Hearing Association |
| 444 | Functional communication measure: spoken language expression | American Speech-Language-Hearing Association |
| 445 | Functional communication measure: spoken language comprehension | American Speech-Language-Hearing Association |
| 446 | Functional communication measure: reading | American Speech-Language-Hearing Association |
| 447 | Functional communication measure: motor speech | American Speech- |

| NQF # | TITLE | STEWARD |
|---|---|---|
| | | Language-Hearing Association |
| 448 | Functional communication measure: memory | American Speech-Language-Hearing Association |
| 449 | Functional communication measure: attention | American Speech-Language-Hearing Association |
| 200 | Death among surgical in-patients with treatable serious complications (failure to rescue) | AHRQ |
| 530 | Mortality for selected conditions | AHRQ |
| 5 | CAHPS clinician/group surveys - (adult primary care, pediatric care, and specialist care surveys) | AHRQ |
| 6 | CAHPS Health Plan Survey v 4.0 - adult questionnaire | AHRQ |
| 7 | NCQA supplemental items for CAHPS 4.0 adult questionnaire (CAHPS 4.0H) | NCQA |
| 8 | Experience of Care and Health Outcomes (ECHO) Survey (behavioral health, managed care versions) | AHRQ |
| 9 | CAHPS Health Plan Survey v 3.0 children with chronic conditions supplement | AHRQ |
| 10 | Young Adult Health Care Survey (YAHCS) | Oregon Health & Science University |
| 11 | Promoting Healthy Development Survey (PHDS) | Oregon Health & Science University |
| 166 | HCAHPS | AHRQ |
| 228 | 3-Item Care Transition Measure (CTM-3) | University of Colorado Health Sciences Center |
| 517 | CAHPS® Home Health Care Survey | CMS |
| 327 | Risk-adjusted average length of inpatient hospital Stay | Premier, Inc |
| 328 | Inpatient hospital average length of stay (risk adjusted) | United Health Group |
| 329 | All-cause readmission index (risk adjusted) | United Health Group |

| NQF # | TITLE | STEWARD |
|---|---|---|
| 330 | 30-Day all-cause risk standardized readmission rate following heart failure hospitalization (risk adjusted) | CMS |
| 331 | Severity-standardized average length of stay—routine care (risk adjusted) | Leapfrog Group |
| 332 | Severity-standardized ALOS - special care | Leapfrog Group |
| 333 | Severity-standardized ALOS – deliveries | Leapfrog Group |
| 495 | Median time from ED arrival to ED departure for admitted ED patients | CMS |
| 496 | Median time from ED arrival to ED departure for discharged ED patients | CMS |
| 497 | Admit decision time to ED departure time for admitted patients | CMS |
| 498 | Door to diagnostic evaluation by a qualified medical personnel | LSU |
| 499 | Left without being seen | LSU |