# TECHNICAL SPECIFICATIONS FOR PROPOSED ACE DEMONSTRATION QUALITY MEASURES REQUESTED IN THE ACUTE CARE DEMONSTRATION APPLICATION

## Introduction

RTI, CMS' design and implementation contractor for the Acute Care Episode (ACE) Demonstration, has developed a Quality Monitoring Program which will take place during the full demonstration period for selected sites. This program is described in the Solicitation for Applications and the first set of data (a subset of the full measure set) will be collected at the time of application submission. See ***Table 1*** below for the full Quality Monitoring Program measure set and the subset of measures that must be reported at time of application[1].

In order to report the requested measures to CMS, we suggest applicants use the pre-formatted Microsoft Excel Guidance Table Shells available on the ACE Demonstration webpage: http://www.cms.hhs.gov/DemoProjectsEvalRpts/downloads/acedemonstration.pdf. See Table 11 within this guidance document for the reporting of quality and utilization measures at the time of application.

Many of the selected measures for application and the ongoing Quality Monitoring Program have been jointly developed by the entities listed below and have been subjected to additional review by several national organizations:

- CMS, which include Reporting Hospital Quality Data for Annual Payment Update (RHQDAPU), Physician Quality Reporting Initiative (PQRI), the Premier Hospital Quality Incentive Demonstration, the Hospital Quality Initiative including public reporting through Hospital Compare, and the National Hospital Inpatient Quality Measures' surgical care improvement project (SCIP)
- Agency for Health Care Research and Quality (AHRQ) patient safety indicators (PSI) and inpatient quality indicators (IQI)
- Joint Commission on Accreditation of Healthcare Organizations (Joint Commission)
- National Committee for Quality Assurance (NCQA)
- Hospital Quality Alliance
- Society of Thoracic Surgeons (STS)

[1] The full measure set being proposed for the Quality Monitoring Program will be reviewed after the demonstration sites have been awarded by CMS in collaboration with the awardees. Modifications to the measures selected or the definitions used to calculate the measures will be considered. It is RTI's and CMS' desire to have a set of measures that are meaningful to the demonstration awardees and useful in their monitoring of quality of care during the demonstration.

- American Academy of Orthopedic Surgeons (AAOS) clinical guidelines
- American College of Cardiology (ACC)/National Cardiovascular Data Registry (NCDR) Implantable Cardioverter Defibrillator (ICD) Registry
- American College of Cardiology percutaneous coronary intervention (PCI) and diagnostic catheterization performance measures and registry (CATHPCI)
- ACC/AHA Task Force on Performance Measures

For each of the quality measures adapted from published sources, we provide a brief narrative description of the measure, denominator inclusion and exclusion criteria, numerator inclusion criteria, and a notes section that details any modifications to the original specifications that we made to the measure for purposes of inclusion in the ACE Demonstration Quality Monitoring Program.

## Table 1
## Anticipated ACE Demonstration Quality Monitoring Program Frequency of Reporting

| | | ACE Demonstration Procedure Groups or Selected Procedures | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hip or Knee Replacement/ Revision | Percutaneous Coronary Intervention (PCI) | Cardiac Defibrillator Implant | Cardiac Pacemaker Implant or Revision | Coronary Artery Bypass Graft (CABG) | Cardiac Valve and Other Major Cardiothoracic |
| **Application Submission by the ACE Demonstration Sites** | | | | | | | |
| Measure 4 | Surgery patients who received appropriate venous thromboembolism prophylaxis within 24 hours prior to surgery to 24 hours after surgery | X | | | | | |
| Measure 8 | Inpatient Mortality Rate | X | X | X | X | X | X |
| Measure 11 | Percent of CABG Patients Returned to operating room during stay | | | | | X | |
| Measure 13 | Revascularization rates by number of vessels separately for PCI and CABG and Percent of CABG procedures performed off pump | | X | | | X | |
| Measure 16 | 30-Day Post-Surgery Mortality Rate | X | X | X | X | X | X |
| Measure 17 | 30-Day Readmission Rate | X | X | X | X | X | X |
| Measure 19 | Severity of Beneficiaries receiving a total hip or knee replacement/revision | X | | | | | |
| Measure 20 | Average and median length of stay | X | X | X | X | X | X |
| Measure 21 | Percent Medicare Outlier Patients | X | X | X | X | X | X |
| **Quarterly Submission by the ACE Demonstration Sites** | | | | | | | |
| Measure 1 | Prophylactic antibiotic received within 1 hour prior to surgical incision | X | | | | X | X |
| Measure 2 | Prophylactic antibiotic selection for surgical patients | X | | | | X | X |
| Measure 3 | Prophylactic antibiotics discontinued within 24 hours after surgery end time for hip and knee replacement and 48 hours for CABG and valve procedure groups | X | | | | X | X |
| Measure 4 | Surgery patients who received appropriate venous thromboembolism prophylaxis within 24 hours prior to surgery to 24 hours after surgery | X | | | | X | X |
| Measure 10 | Anti-Platelet Medication Prescribed at Discharge | | | | | X | |
| Measure 12 | Percent of PCI procedures with angiographic success and no death, myocardial infarction (MI), or emergent/salvage CABG | | X | | | | |
| Measure 13 | Revascularization rates by number of vessels separately for PCI and CABG | | X | | | X | |

(continued)

## Table 1 (continued)
## Anticipated ACE Demonstration Quality Monitoring Program Frequency of Reporting

| | | ACE Demonstration Procedure Groups or Selected Procedures | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hip or Knee Replacement/ Revision | Percutaneous Coronary Intervention (PCI) | Cardiac Defibrillator Implant | Cardiac Pacemaker Implant or Revision | Coronary Artery Bypass Graft (CABG) | Cardiac Valve and Other Major Cardiothoracic |
| **Quarterly Calculation by RTI** | | | | | | | |
| Measure 5 | Postoperative Hemorrhage/Hematoma | X | X | X | X | X | X |
| Measure 6 | Postoperative Physiologic and Metabolic Derangement | X | X | X | X | X | X |
| Measure 7 | Post-operative Sepsis | X | | | | X | X |
| Measure 9 | Use of Internal Mammary Artery in first time isolated CABG | | | | | X | |
| Measure 11 | Percent of CABG Patients Returned to operating room during stay | | | | | X | |
| Measure 14 | Post-operative Stroke | X | X | X | X | X | X |
| Measure 16 | 30-Day Post-Surgery Mortality Rate | X | X | X | X | X | X |
| Measure 17 | 30-Day Readmission Rate | X | X | X | X | X | X |
| Measure 18 | Change in mix of MS-DRG assignments | X | X | X | X | X | X |
| Measure 19 | Severity of Beneficiaries receiving a total hip or knee replacement/revision | X | | | | | |
| Measure 20 | Average and median length of stay | X | X | X | X | X | X |
| Measure 21 | Percent Medicare Outlier Patients | X | X | X | X | X | X |
| Measure 22 | Percent Discharge Destination is acute care hospital transfer or post-acute | X | X | X | X | X | X |
| **Semi-Annual Calculation by RTI** | | | | | | | |
| Measure 15 | Percent of ACE Demonstration procedure cardiovascular re-dos or orthopedic revisions during the prior six-months | X | X | X | X | X | X |
| **Annual Calculation by RTI** | | | | | | | |
| Measure 8 | Inpatient Mortality Rate | X | X | X | X | X | X |

Quality measures for the ACE Demonstration will be calculated for surgical procedures within six groupings of procedures unless otherwise specified:

- hip or knee replacement or revision of replacement
- percutaneous coronary intervention (PCI)
- cardiac defibrillator implant
- permanent cardiac pacemaker implant
- coronary artery bypass graft (CABG)
- cardiac valve and other major cardiothoracic

***Table 2*** contains the crosswalk between the ACE Demonstration procedure groups and the MS-DRGs included in the demonstration. The last column in ***Table 2*** contains the ICD-9 procedure codes for several lower limb reattachment and total ankle replacement surgical procedures that are excluded from the ACE Demonstration.

**Table 2**
**ACE Demonstration procedure group definitions: MS-DRG codes and ICD-9 procedure code exclusions**

| ACE Procedure Groups | Short name | MS-DRGs | ICD-9 procedure code exclusions |
|---|---|---|---|
| **Cardiac** | | | |
| Cardiac valve procedures | Cardiac valve | 216-221 | |
| Cardiac defibrillator implant procedures | Defibrillator | 226 – 227 | |
| Coronary Artery Bypass Graft procedures | CABG | 231-236 | |
| Permanent cardiac pacemaker implant, revision, or replacement | Pacemaker | 242-244, 258-262 | |
| Percutaneous Coronary Intervention | PCI | 246-251 | |
| **Orthopedic** | | | |
| Bilateral or multiple major joint procedures of lower extremity | Hip & Knee | 461, 462 | 81.56 |
| Revision of hip or knee replacement | Hip & Knee | 466-468 | |
| Major joint replacement or reattachment of lower extremity | Hip & Knee | 469-470 | 84.26, 84.27, 84.28 |
| Knee procedures w/o principal diagnosis of infection | Hip & Knee | 488, 489 | |

**Quality & Utilization Measure Submission at the Time of Application**

At the time of the application, CMS will collect nine quality measures for as many of the ACE Demonstration groups as the Physician-Hospital Organization (PHO) is proposing to accept a bundled payment and the measure is applicable. Again, the nine application quality measures are a subset of the full set of ACE Demonstration Quality Monitoring Program measures. Eight measures are able to be calculated using the hospital's billing records and one will require medical record abstraction of 30 discharges.

The beginning population for the eight hospital billing record-calculated measures would ideally consist of all Medicare beneficiaries who were discharged in calendar year 2007 in one of the ACE Demonstration DRGs. For simplicity, restrictions need not be made to the population to more closely align with the criteria that will be used in the demonstration. Sampling is not to be used during the demonstration. One measure (Measure 4: surgery patients who received appropriate venous thromboembolism prophylaxis within 24 hours prior to surgery to 24 hours after surgery) requires medical record abstraction using the thirty most recent discharges for hip and knee replacement.

RTI will develop or use an existing risk adjustment model with the basic elements of the risk adjuster being demographic factors and diagnoses. The model will be used to calculate risk-adjusted inpatient mortality rates (Measure 8) and 30 day post-surgery mortality rates (Measure 16). We ask that you report unadjusted mortality rates.

Detailed specifications are provided on the method of calculation that will be used during the demonstration on the pages that follow.

| | |
|---|---|
| Measure 4: | Surgery patients who received appropriate venous thromboembolism prophylaxis within 24 hours prior to surgery to 24 hours after surgery[2] |
| Measure 8: | Inpatient Mortality Rate |
| Measure 11: | Percent of CABG patients returned to operating room during stay |
| Measure 13: | Revascularization rates by number of vessels separately for PCI and CABG and Percent of CABG Procedures performed off pump |
| Measure 16: | 30-Day Post-Surgery Mortality Rate |
| Measure 17: | 30-Day Readmission Rate |
| Measure 19: | Severity of Beneficiaries receiving a total hip/knee replacement/revision |
| Measure 20: | Average and median length of stay |
| Measure 21: | Percent Medicare Outlier Patients |

[2] This measure requires medical record abstraction of your most recent 30 hip and/or knee replacement discharges.

## Measure 4: Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery

**Description:** Percent of surgical patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to Surgical Incision Time to 24 hours after *Surgery End Time.*

**Denominator Inclusion:** This measure is calculated for all discharges in the hip and knee replacement ACE Demonstration procedure group.

**Denominator Exclusion:**

1. Patients who have a length of Stay > 120 days
2. Patients whose total surgery time is less than or equal to 60 minutes
3. Patients who stayed less than or equal to 24 hours post-op
4. Patients who are on warfarin prior to admission (See ***Table 3***)
5. Patients with contraindications to both mechanical and pharmacological prophylaxis
6. Patients who stayed less than or equal to 3 calendar days postoperatively
7. Patients who did not receive *VTE Prophylaxis*

**Numerator Inclusion:** Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 hours prior to *Surgical Incision Time* to 24 hours after *Surgery End Time*. See ***Table 4*** for recommended prophylaxis.

**Notes:**

1. We made modifications to the CMS specifications so that they would be more appropriate to the ACE Demonstration. As we want to evaluate the quality of care for ***all*** ACE Demonstration beneficiaries, we removed exclusions such as age restrictions and participation in a clinical trial. Further, we removed inclusion or exclusion criteria that are not applicable to ACE Demonstration participants, such as having the procedure prior to the date of admission. The following modifications have been made:
    a) Patients less than 18 years of age
    b) Burn patients
    c) Patients with procedures performed entirely by laparoscope
    d) Patients enrolled in clinical trials
    e) Patients whose principal procedure occurred prior to the date of admission
2. The American Academy of Orthopaedic Surgeons has a clinical guideline on prevention of symptomatic pulmonary embolism in patients undergoing hip or knee arthroplasty.

3. The Premier Demonstration extension as well as PQRI, Hospital Compare, and RHQDAPU use this measure.

**Table 3**
**Trade names for Warfarin**

| |
|---|
| Barr Warfarin Sodium |
| Coumadin |
| Dicumarol |
| Jantoven |
| Panwarfin |
| Warfarin |

**Table 4**
**Selection of prophylaxes**

| **Surgery** | **Recommended prophylaxes** |
|---|---|
| Total hip replacement * | Any of the following started within 24 hours of surgery:<br>• Low molecular weight heparin (LMWH)<br>• Factor Xa Inhibitor (Fondaparinux)<br>• Warfarin |
| Total hip replacement with high risk for bleeding* | Any of the following:<br>• Graduated Compression stockings (GCS)<br>• Intermittent pneumatic compression (IPC)<br>• Venous foot pump (VFP) |
| Total knee replacement | Any of the following:<br>• Low molecular weight heparin (LMWH)<br>• Factor Xa Inhibitor (Fondaparinux)<br>• Warfarin<br>• Intermittent pneumatic compression devices (IPC)<br>• Venous foot pump (VFP) |

*Patients who receive neuraxial anesthesia or have a documented bleeding risk may pass the performance measure if appropriate pharmacologic or mechanical prophylaxis is ordered.

## Measure 8: Inpatient Mortality

**Description:** Number of inpatient deaths per 100 discharges within each ACE Demonstration procedure groups.

**Denominator Inclusion:** All discharges for the ACE Demonstration groups of CABG, cardiac valve, cardiac defibrillator implantation, cardiac pacemaker insertion, PCI, and hip and knee replacement/revision ACE Demonstration procedure groups.

**Denominator Exclusions:**

1. Cases transferring to another short-term hospital

**Numerator Inclusion:** All beneficiaries who died during the ACE Demonstration procedure hospitalization.

**Notes:**

1. The following exclusions present in the AHRQ specifications are not applied in the calculation of the ACE Demonstration measures because they do not apply to the ACE Demonstration population:

    a. AHRQ specification is limited to discharges for patients 40 years and older

    a) AHRQ specification excludes records with MDC 14 (pregnancy, childbirth, and puerperium)

    b) AHRQ specification excludes records with MDC 15 (newborns and other neonates)

    c) Missing discharge disposition

2. The Society of Thoracic Surgeons uses an NQF endorsed measure of Risk-Adjusted Inpatient Operative Mortality for CABG, which is restricted to cases with isolated CABGs, and is risk-adjusted using a multivariate hierarchical model.

3. Inpatient mortality is reported in the Premier Demonstration for isolated CABG but is not reported for hip and knee replacement.

4. The ACC/AHA Task Force on Performance Measures has an NQF endorsed risk-adjusted PCI mortality measure. Mortality is tracked in the CathPCI Registry and the ACC-NCDR ICD Registry.

## Measure 11: Surgical Re-exploration in Isolated CABG Patients during Stay

**Definition:** Percent of isolated CABG procedure patients who return to the operating room for bleeding/tamponade, graft occlusion, or other cardiac reasons. This is an NQF endorsed Society of Thoracic Surgery measure.

**Denominator Inclusion:** All patients with a procedure in the CABG ACE Demonstration procedure group who received an isolated CABG (ICD-9-CM procedure codes: 36.10-36.17, 36.19).

**Denominator Exclusions:**

1. Other heart procedures (ICD-9 procedure codes 37.32, 37.33, 37.34, 37.35, 36.2, and 35.00-35.99)

**Numerator Inclusion:** All cases where the patient experienced surgical exploration.

Notes:

1. RTI is seeking greater clarification from the STS and NQF on the specifications for this measure.

## Measure 13: Revascularization Rates by Number of Vessels and Percent of CABG Procedures Performed Off Pump

**Definition:** Percent of PCI patients and CABG patients by number of vessels treated and percent of CABG procedures performed off pump.

**Denominator Inclusion:** All patients with a cardiovascular procedure(s) in the PCI and/or CABG ACE Demonstration procedure groups. Patients should be reported in the procedure group that reflects their total cardiovascular experience during the ACE Demonstration hospitalization.

**Measure 13a:** PCI only

**Measure 13b:** CABG only

**Measure 13c:** PCI and CABG.

**Denominator Exclusions:** There are no exclusions.

**Numerator Inclusion:**

**Definition 1:** For each discharge, the number of unique vessels treated either through PCI or CABG.

**Definition 2:** The number of discharges performed off pump.

**Measure 13a1:**
Single vessel (excluding left main)
Left Main
Double vessel
More than double vessel

**Measure 13b1:**
Single vessel (excluding left main)
Left Main
Double vessel
More than double vessel

**Measure 13b2:** Number of Cases off pump

| | |
|---|---|
| **Measure 13c1:** | Single vessel (excluding left main)<br>Left Main<br>Double vessel<br>More than double vessel |
| **Measure 13c2:** | Number of Cases off pump |

**Notes:**

1. Report numerator and denominator separately as well as the calculated percent. The sum of the three percents for numerator definition must be 100 percent.

2. If multiple reperfusion techniques are used on the same vessel, count the vessel only once.

## Measure 16: 30-Day Post-Surgery Mortality

**Description:** Number of deaths within 30 days of surgery within each ACE Demonstration procedure groups.

**Denominator Inclusion:** All discharges assigned to the CABG, cardiac valve, cardiac defibrillator implantation, cardiac pacemaker insertion, PCI, and hip and knee replacement/revision ACE Demonstration procedure groups.

**Denominator Exclusions:**

1. Cases transferring to another short-term hospital

**Numerator Inclusion:** Number of deaths within 30 days of the procedure.

**Notes:**

1. The Society of Thoracic Surgeons uses an NQF endorsed measures of 30 day post surgery (including inpatient) Risk-Adjusted Operative Mortality for CABG, Aortic Valve Replacement, Mitral Valve Replacement/Repair, MVR+CABG, and AVR+CABG. Volume of procedures may prohibit the development of these sets of mortality rates. We will explore the stability of rates calculated for the STS cardiovascular groupings of CABG and valve replacement.

2. Hospital Compare reports 30-day post admission mortality for the clinical conditions of AMI, heart failure, and pneumonia.

3. RHQDAPU has a 30-day post admission mortality measure for heart failure and AMI.

4. The Premier Demonstration is testing a 30-day post admission mortality measure for the clinical conditions of AMI, heart failure, and pneumonia.

5. The ACC/AHA Task Force on Performance Measurement has an NQF endorsed morality measure for PCI.

## Measure 17: 30-Day Post-Discharge Readmission Rate

**Description:** Readmission to same facility within 30 days of discharge.

**Denominator Inclusion:** All discharges assigned to the CABG, cardiac valve, cardiac defibrillator implantation, cardiac pacemaker insertion, PCI, and hip and knee replacement/revision ACE Demonstration procedure groups.

**Denominator Exclusions:**

1. Patients who expire during the ACE Demonstration procedure hospitalization
2. Same-Day Readmits – Patients who are discharged and readmitted the same day

**Numerator Inclusion:** Number of patients who are readmitted within 30 days of date of discharge for any cause.

**Notes:**

1. The Premier Demonstration measure has numerous exclusions for the different clinical conditions. We are only applying the above two exclusions.
2. Readmissions will be limited to the same facility or to other facilities within MAC 4 depending upon our availability of hospital discharge information. If we are unable to obtain hospital discharge information from the MAC, then we will restrict this measure to the same facility. If we are able to obtain discharge information from MAC 4, then we will expand our focus to include other acute care facilities within MAC 4. However, we will not capture readmissions to acute care hospitals outside of MAC 4.

## Measure 19: Severity of Beneficiaries Receiving a Total Hip or Knee Replacement/Revision

**Description:** Percentage of total hip or knee replacements that are of advanced age, or have clinical conditions that reflect greater morbidity at the time of surgery.

**Denominator Inclusion:** All discharges assigned to the hip and knee replacement/revision ACE Demonstration procedure group.

**Denominator Exclusions:** There are no exclusions.

**Numerator Inclusion:** Number of patients that meet the following three criteria:

1. over age 75
2. with hip fracture (hip replacements/revisions only)
3. with rheumatoid arthritis

**Notes:**

1. Three separate rates are calculated for each of the clinical conditions listed in the numerator inclusion criteria.

## Measure 20: Average and Median Length of Stay

**Description:** Average and median length of stay for all discharges within each of the ACE Demonstration procedure groups. The NQF currently has this measure under consideration.

**Denominator Inclusion:** All discharges assigned to the each of the CABG, cardiac valve, cardiac defibrillator implantation, cardiac pacemaker insertion, PCI, and hip and knee replacement/revision ACE Demonstration procedure groups.

**Denominator Exclusions:** There are no exclusions.

**Numerator Inclusion:** Number of days of stay for each case assigned to the each of the ACE Demonstration procedure groups.

## Measure 21: Percent Medicare Outlier Patients

**Description:** Percent of ACE Demonstration discharges that are determined to be IPPS cost outliers

**Denominator Inclusion:** All discharges assigned to the each of the CABG, cardiac valve, cardiac defibrillator implantation, cardiac pacemaker insertion, PCI, and hip and knee replacement/revision ACE Demonstration procedure groups.

**Denominator Exclusions:**

1. Cases transferred to another acute care hospital.

**Numerator Inclusion:** Number of cases that qualify as an IPPS outlier.