# NATIONAL QUALITY FORUM

**Measure Evaluation 4.1**
**December 2009**

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

**TAP/Workgroup** (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

**Steering Committee:** Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few subcriteria as indicated)

| (for NQF staff use) **NQF Review #:** 0361 **NQF Project:** Surgery Endorsement Maintenance 2010 |
|---|
| **MEASURE DESCRIPTIVE INFORMATION** |
| De.1 **Measure Title:** Esophageal Resection Volume (IQI 1) |
| De.2 **Brief description of measure:** Number of discharges with a procedure for esophogeal resection |
| 1.1-2 **Type of Measure:** Structure/management<br>De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** Esophageal Resection Mortality (IQI 8) |
| De.4 **National Priority Partners Priority Area:** Population health, Safety<br>De.5 **IOM Quality Domain**: Effectiveness<br>De.6 **Consumer Care Need:** Getting better |

| CONDITIONS FOR CONSIDERATION BY NQF | |
|---|---|
| Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards: | NQF Staff |
| **A.** The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*<br>A.1 **Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes<br>A.2 **Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:**<br>A.3 **Measure Steward Agreement:** Government entity and in the public domain - no agreement necessary<br>A.4 **Measure Steward Agreement attached:** | **A**<br>Y☐<br>N☐ |
| **B.** The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section | **B**<br>Y☐<br>N☐ |

| | |
|---|---|
| **C.** The intended use of the measure includes both public reporting and quality improvement.<br>►**Purpose:** Public reporting, Internal quality improvement<br>Accountability | **C**<br>Y☐<br>N☐ |
| **D.** The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement.<br>D.1**Testing:** Yes, fully developed and tested<br>D.2 **Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?**<br>Yes | **D**<br>Y☐<br>N☐ |
| (for NQF staff use) **Have all conditions for consideration been met?**<br>**Staff Notes to Steward** (*if submission returned*)**:** | **Met**<br>Y☐<br>N☐ |
| **Staff Notes to Reviewers** (*issues or questions regarding any criteria*)**:** | |
| **Staff Reviewer Name(s):** | |

| | |
|---|---|
| **TAP/Workgroup Reviewer Name:** | |
| **Steering Committee Reviewer Name:** | |
| **1. IMPORTANCE TO MEASURE AND REPORT** | |
| Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance. ***Measures must be judged to be important to measure and report*** *in order to be evaluated against the remaining criteria.* (evaluation criteria)<br>**1a. High Impact** | **Eval Rating** |
| (for NQF staff use) **Specific NPP goal**: | |
| 1a.1 **Demonstrated High Impact Aspect of Healthcare:** Severity of illness, Patient/societal consequences of poor quality<br>1a.2<br><br>1a.3 **Summary of Evidence of High Impact:** Esophageal resection is a procedure requiring technical proficiency. Complications can include pneumonia, sepsis, anastomotic breakdown, and death. Many studies have demonstrated a relationship between hospital volume and mortality (at least fourteen studies), while only two have found no such relationship.<br><br>1a.4 **Citations for Evidence of High Impact:** Patti MG, Corvera CU, Glasgow RE, et al. A hospital´s annual rate of esophagectomy influences the operative mortality rate. J Gastrointest Surg 1998;2(2):186-92.<br><br>Owings MF, Kozak LJ. Ambulatory and inpatient procedures in the United States, 1996. Vital Health Stat 13 1998(139):1-119.<br><br>Begg CB, Cramer LD, Hoskins WJ, et al. Impact of hospital volume on operative mortality for major cancer surgery. JAMA 1998;280(20):1747-51.<br><br>Gordon TA, Bowman HM, Bass EB, et al. Complex gastrointestinal surgery: impact of provider experience on clinical and economic outcomes. J Am Coll Surg 1999;189(1):46-56.<br><br>Dimick JB, Cattaneo SM, Lipsett PA, et al. Hospital volume is related to clinical and economic outcomes of esophageal resection in Maryland. In: Ann Thorac Surg; 2001. p. 334-9; discussion 339-41. | **1a**<br>C☐<br>P☐<br>M☐<br>N☐ |

Dimick JB, Cowan JA, Jr., Ailawadi G, et al. National variation in operative mortality rates for esophageal resection and the need for quality improvement. Arch Surg 2003;138(12):1305-9.

Dimick JB, Pronovost PJ, Cowan JA, Jr., Lipsett PA. Surgical volume and quality of care for esophageal resection: Do high-volume hospitals have fewer complications? In: Ann Thorac Surg; 2003. 75:337-41

van Lanschot JJ, Hulscher JB, Buskens CJ, et al. Hospital volume and hospital mortality for esophagectomy; 2001.
Finlayson EV, Goodney PP, Birkmeyer JD, inventors; Hospital volume and operative mortality in cancer surgery: a national study. 2003 Jul.

Dudley RA, Johansen KL, Brand R, et al. Selective referral to high-volume hospitals: estimating potentially avoidable deaths. In: Jama; 2000. p. 1159-66.

Halm EA, Lee C, Chassin MR. Is volume related to outcome in health care? A systematic review and methodologic critique of the literature. In: Ann Intern Med; 2002. p. 511-20.

Dimick JB, Wainess RM, Upchurch GR, Jr., et al. National trends in outcomes for esophageal resection. In: Ann Thorac Surg; 2005. p. 212-6; discussion 217-8.

Wenner J, Zilling T, Bladstrom A, et al. The influence of surgical volume on hospital mortality and 5-year survival for carcinoma of the oesophagus and gastric cardia. In: Anticancer Res; 2005. p. 419-24.

**1b. Opportunity for Improvement**

**1b.1 Benefits (improvements in quality) envisioned by use of this measure:** Providers should increase volume or patients should select high volume providers in order to reduce overall mortality rates

**1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:**
Annual volume for IQI #01 Esophageal Resection Volume by quartile 1.0 (Q1) 1.4 (Q2) 2.4 (Q3) 8.4 (Q4)

**1b.3 Citations for data on performance gap:**
AHRQ 2007 State Inpatient Databases (SID) 424 hospitals and 1,587 discharges

**1b.4 Summary of Data on disparities by population group:**
Not applicable

**1b.5 Citations for data on Disparities:**
Not applicable

**1b**
**C☐**
**P☐**
**M☐**
**N☐**

**1c. Outcome or Evidence to Support Measure Focus**

**1c.1 Relationship to Outcomes** (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** Volume indicators are proxy, or indirect, measures of quality. They are based on evidence suggesting that hospitals performing more of certain intensive, high-technology, or highly complex procedures may have better outcomes for those procedures.

**1c.2-3. Type of Evidence:** Systematic synthesis of research

**1c.4 Summary of Evidence** (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
This indicator is part of the AHRQ Inpatient Quality Indicator set and stems from the literature summarized below. The indicator is focused on the volume of esophageal resection performed for any indication, a procedure requiring high technical skill. Only adult patients are included.

Literature based evidence

**1c**
**C☐**
**P☐**
**M☐**
**N☐**

Highlights of literature evidence:

1. Esophageal resection is a procedure requiring technical proficiency. Complications can include pneumonia, sepsis, anastomotic breakdown, and death.

2. Many studies have demonstrated a relationship between hospital volume and mortality (at least fourteen studies), while only two have found no such relationship. Methodology varies between studies including data used (e.g., clinical, administrative), adjustment of confounding factors, and accounting for the volume of the operating surgeon.

3. A few studies have also demonstrated better pre-operative characterization of the extent of disease, shorter length of stay, shorter ICU length of stay, fewer serious postoperative complications, lower hospital charges, and more discharges to home at high-volume centers, compared with low-volume centers.

4. One study demonstrated that volume of the operating surgeon accounted for about half of the hospital volume-mortality effect.

Detailed literature evidence

Face validity. Procedure volume is a surrogate measure of quality; its face validity depends on whether a strong association with outcomes of care is both plausible and widely accepted in the professional community.
Esophageal cancer surgery requires technical proficiency; errors in surgical technique or management may lead to clinically significant complications, such as sepsis, pneumonia, anastomotic breakdown, and death. However, we are not aware of any consensus guidelines or recommendations regarding minimum procedure volume. The National Cancer Policy Board of the Institute of Medicine and the National Research Council recommends that cancer "patients undergoing procedures that are technically difficult to perform and have been associated with higher mortality in lower-volume settings (including esophagectomy) receive care at facilities with extensive experience (e.g., high-volume facilities)."

Precision. The number of esophagectomies is measured accurately with discharge data; in fact, discharge data are probably the best available source for hospital volume information. Although a few facilities have relatively high volumes, most (e.g., 239 of 273 California hospitals)1 perform 10 or fewer esophagectomies for cancer during a 5-year period. As a result, this measure is expected to have poor precision.

Minimum bias. Volume measures are not subject to bias due to disease severity and comorbidities. For this reason, risk-adjustment is not appropriate. Although volume measures are theoretically subject to bias due to variation across hospitals in the use of outpatient surgery facilities, less than 1% of resections in 1996 were performed in ambulatory settings." 2
Construct validity. Volume is not a direct measure of the quality or outcomes of care. Although higher volumes have been repeatedly associated with better outcomes after esophageal surgery, these findings may be limited by inadequate risk adjustment.
Only two studies used clinical data to estimate the association between hospital volume and mortality following esophageal cancer surgery. Begg et al.3 analyzed retrospective cohort data from the Surveillance, Epidemiology, and End Results(SEER)-Medicare linked database from 1984 through 1993. The crude 30-day mortality rate was 17.3% at hospitals that performed 1-5 esophagectomies on Medicare patients during the study period, versus 3.9% and 3.4% at hospitals that performed 6-10 and 11 or more esophagectomies, respectively. The association between volume and mortality remained highly significant ($p<.001$) in a multivariate model, adjusting for the number of comorbidities, cancer stage and volume, and age. The association between hospital volume and mortality (OR=0.50, 95% CI 0.24-1.05 at hospitals with 11-20 cases/year and OR=0.49, 95% CI 0.24-0.97 at hospitals with >20 cases/year, relative to lower volume hospitals) also persisted after adjustment for cancer stage and physiologic predictors, such as the Physiological and Operative Severity Score for the enumeration of Morbidity and Mortality (POSSUM), in one study from the UK (Mortality Ref 5).
The two earliest studies using hospital discharge data found similar effects of hospital volume. Using 1990-94 data from California, Patti et al.1 estimated risk-adjusted mortality rates of 17%, 19%, 10%, 16%, and 6% across five hospital volume categories (e.g., 1-5, 6-10, 11-20, 21-30, and >30 procedures during the 5-year

study period). Their risk adjustment was quite limited; only the year of surgery, age, sex, race, payer source, tumor location, and the total number of secondary diagnoses were included. Using 1990-97 data from Maryland (adjusting only for age and payer source), Gordon et al.4 estimated that the adjusted odds of death at minimal-volume (<11 "complex gastrointestinal procedures" per year) and low-volume (11-20 procedures/ year) hospitals were 3.8 and 4.0 times that at a high-volume hospital (214 procedures/year). However, the generalizability of these results is limited by the fact that the last category included only one hospital.

This inverse association between hospital volume and mortality has been confirmed in several more recent studies, using a wide variety of administrative databases. 5-13 In the most prominent such study, Birkmeyer et al used Medicare data from 1994 through 1999 to estimate volume-outcome relationships, imputing total annual hospital volume and adjusting for age, sex, race, year of the procedure, urgency of admission, mean income from Social Security at the ZIP Code level, and coexisting conditions from the index admission and other admissions within the preceding six months (summarized as the Charlson Comorbidity Index). They found that crude mortality rates were 23.1, 18.9, 16.9, 11.7, and 8.1 percent in very low (<2 imputed cases/year), low (2-4), medium (5-7), high (8-19) and very high (>19) volume hospital groups, respectively. Unadjusted and adjusted odds ratios were 0.78 and 0.85, 0.68 and 0.76, 0.44 and 0.51, and 0.29 and 0.36 in low, medium, high and very high volume hospitals, respectively, relative to very low volume hospitals. 14 Similar findings (e.g., 2.6 to 2.9-fold variation in adjusted mortality across hospital volume strata) have been reported from studies based on the Nationwide Inpatient Sample, which is designed as a 20% random sample of all hospital discharges in the US.6,9 This association was confirmed in the Netherlands, where hospital mortality was reported as 12.1, 7.5%, and 4.9% at low (1-10 cases/year), medium (11-20), and high (>50) volume centers, respectively.33 A weaker but still significant effect was observed in Ontario, with an adjusted odds ratio of 1.9 at the lowest volume hospitals (mean 2.8 cases/year) relative to the highest volume hospitals (mean 19.0 cases/year).25

Hospital volume has been associated with other outcomes in addition to mortality. Using Massachusetts discharge data from 1992 to 2000, Kuo et al showed that high volume hospitals (>6 cases/yr) were associated with a 2-day decrease in median length of stay ($p<0.001$), a 3-day reduction in median intensive care unit stay ($p<0.001$), an increased rate of home discharge as opposed to rehabilitation hospital ($p<0.001$), and a 3.7-fold decrease in hospital mortality, relative to lower volume hospitals. The adjusted odds ratio for death at low volume hospitals was 4.3 (95% CI: 2.3 to 7.7).15 Using Medicare data from 1994 through 1999, Birkmeyer's group also found that mean postoperative length of stay was about 2 days shorter at the highest volume hospitals (>19 imputed cases/year) than at lower volume hospitals (18.2 versus 19.6-20.1 days), but readmission rates did not differ across volume strata.36 Using Maryland hospital discharge data from 1994 to 1998, Dimick et al. confirmed earlier findings related to mortality (2.5% at hospitals with at least 34 cases during the study period, versus 15.4% at lower-volume hospitals), but also found a decreased risk of pulmonary failure (2.9% versus 11.8%), renal failure (0.5% versus 8.0%), aspiration (16% versus 34%), reintubation (7.8% versus 27%), surgical complications (6.9% versus 14%), and septicemia (1.5% versus 6.2%) at high-volume hospitals.7 In a separate study, they also reported a 6-day (32%) difference in mean length of stay, and an $11,673 (35%) difference in mean charges, between hospitals that did more than 15 cases per year and hospitals that did fewer than 4 cases per year.5

Some studies have attempted to investigate surgeon volume effect. A recent British study examined the 30-day mortality among operators for esophagectomy. The 30-day mortality rate was greatest in the infrequent operators (<4 resections/yr) compared with both the intermediate group (4-11 resections/yr) and the frequent group (15.1% versus 6.6% and 11.8%, respectively). This volume effect disappeared in a parallel analysis of 5-year survival.16 An older British study also found a surgeon volume effect, but did not consider hospital volume.18 Birkmeyer et al showed that surgeon volume was inversely related to operative mortality and accounted for a large proportion of the apparent effect of hospital volume. For esophagectomy, the proportion of the hospital volume effect attributable to surgeon volume was 46%.17

Finally, a recent study in Netherlands on 573 patients diagnosed with esophageal cancer (1994-2003) showed that the preoperative investigations performed in low-volume regional centers detected true-positive malignant lymph nodes in 8% of patients and true-positive distant metastases in 7% of patients, whereas these percentages were 16% and 20%, respectively, in the high-volume referral center. 19 These findings suggested better preoperative evaluation of patients at high-volume centers.

Only a few studies have discounted the robust association between volume and outcome. One study, by Christian et al, tested whether volume was a significant predictor of mortality among 87 university teaching hospitals. All possible thresholds for volume were tested and the optimal threshold at which the odds ratio was the highest was estimated. Although they reported being "unable to identify a consistent relationship between volume and outcome" for esophagectomy, they also found an empirical threshold of 22 procedures

per year, below which hospital mortality was increased between 2 and 3-fold.20 Two other studies reported excellent outcomes from low-volume hospitals, but did not evaluate the volume outcome association.21, 22 In a Canadian study, using the Ontario cancer registry data from 1990 to 2000, surgery in a high-volume versus a low-volume hospital did not have a statistically significant influence on the odds of operative death for patients who underwent esophageal cancer resection.27

Although volume-outcome associations have been demonstrated for esophageal cancer surgery, volume seems likely to both insensitive and nonspecific as a measure of quality. It has been estimated that shifting patients in California from low-volume to high-volume hospitals would avert only 7 deaths per year, although 77% of all operations are performed in low-volume hospitals.29 One recent study in California showed that only 9% of hospitals met the 7 esophageal cancer resections per year criterion of the Leapfrog Group in 2000.24 Another study in Connecticut showed that only one hospital performed more than 7 esophageal cancer resections in FY 2000.30

Several other studies have investigated the impact of shifting patients on "avoidable deaths". One study in Ontario also showed that the absolute number of operative deaths that could potentially be avoided by shifting cases to high volume centers for esophagectomy from 1994 to 1999 would have been 4 (95% CI, 0 to 9).25 Using data from National Inpatient Sample, Birkmeyer et al estimated the total number of esophagectomy procedures performed in US, and the number of potential avoidable deaths if the Leapfrog volume standards were implemented. They found that with full nationwide implementation of the Leapfrog volume standard (which currently limits esophagectomy to hospitals with 13 or more procedures per year), 168 lives would have been saved in 1997 31 and 180 lives in 2000.32

Fosters true quality improvement. One possible adverse effect of volume-based measures is to encourage low-volume providers (who may also provide poorer quality of care) to increase their volume, simply to reach a threshold of 6 cases per year. Such responses would probably not improve patient outcomes to the same extent as moving patients from low-volume to high-volume hospitals. At the extreme, hospitals may loosen eligibility criteria and perform procedures on patients who are marginal or inappropriate candidates. The alternative of shutting down low-volume hospitals and transferring procedures to high-volume hospitals may overload these providers and impair access to care. None of these hypothesized effects has been empirically evaluated or demonstrated.

Prior use. This indicator has been utilized in the National Healthcare Quality Report35 and is currently included in the AHRQ Inpatient Quality Indicator set.

**1c.5 Rating of strength/quality of evidence (***also provide narrative description of the rating and by whom***):** Not applicable

**1c.6 Method for rating evidence:** Not applicable

**1c.7 Summary of Controversy/Contradictory Evidence:** None

**1c.8 Citations for Evidence (***other than guidelines***):** References

1. Patti MG, Corvera CU, Glasgow RE, et al. A hospital´s annual rate of esophagectomy influences the operative mortality rate. J Gastrointest Surg 1998;2(2):186-92.
2. Owings MF, Kozak LJ. Ambulatory and inpatient procedures in the United States, 1996. Vital Health Stat 13 1998(139):1-119.
3. Begg CB, Cramer LD, Hoskins WJ, et al. Impact of hospital volume on operative mortality for major cancer surgery. JAMA 1998;280(20):1747-51.
4. Gordon TA, Bowman HM, Bass EB, et al. Complex gastrointestinal surgery: impact of provider experience on clinical and economic outcomes. J Am Coll Surg 1999;189(1):46-56.
5. Dimick JB, Cattaneo SM, Lipsett PA, et al. Hospital volume is related to clinical and economic outcomes of esophageal resection in Maryland. In: Ann Thorac Surg; 2001. p. 334-9; discussion 339-41.
6. Dimick JB, Cowan JA, Jr., Ailawadi G, et al. National variation in operative mortality rates for esophageal resection and the need for quality improvement. Arch Surg 2003;138(12):1305-9.
7. Dimick JB, Pronovost PJ, Cowan JA, Jr., Lipsett PA. Surgical volume and quality of care for esophageal resection: Do high-volume hospitals have fewer complications? In: Ann Thorac Surg; 2003. 75:337-41
8. van Lanschot JJ, Hulscher JB, Buskens CJ, et al. Hospital volume and hospital mortality for

esophagectomy; 2001.
9. Finlayson EV, Goodney PP, Birkmeyer JD, inventors; Hospital volume and operative mortality in cancer surgery: a national study. 2003 Jul.
10. Dudley RA, Johansen KL, Brand R, et al. Selective referral to high-volume hospitals: estimating potentially avoidable deaths. In: Jama; 2000. p. 1159-66.
11. Halm EA, Lee C, Chassin MR. Is volume related to outcome in health care? A systematic review and methodologic critique of the literature. In: Ann Intern Med; 2002. p. 511-20.
12. Dimick JB, Wainess RM, Upchurch GR, Jr., et al. National trends in outcomes for esophageal resection. In: Ann Thorac Surg; 2005. p. 212-6; discussion 217-8.
13. Wenner J, Zilling T, Bladstrom A, et al. The influence of surgical volume on hospital mortality and 5-year survival for carcinoma of the oesophagus and gastric cardia. In: Anticancer Res; 2005. p. 419-24.
14. Birkmeyer JD, Siewers AE, Finlayson EV, et al. Hospital volume and surgical mortality in the United States. In: N Engl J Med; 2002. p. 1128-37.
15. Kuo EY, Chang Y, Wright CD. Impact of hospital volume on clinical and economic outcomes for esophagectomy. In: Ann Thorac Surg; 2001. p. 1118-24.
16. Gillison EW, Powell J, McConkey CC, et al. Surgical workload and outcome after resection for carcinoma of the oesophagus and cardia. In: Br J Surg; 2002. p. 344-8.
17. Birkmeyer JD, Stukel TA, Siewers AE, et al. Surgeon volume and operative mortality in the United States; 2003. p. 2117-27 .
18. Matthews HR, Powell DJ, McConkey CC. Effect of surgical experience on the results of resection for oesophageal carcinoma. Br J Surg 1986;73(8):621-3.
19. van Vliet EP, Eijkemans MJ, Kuipers EJ, et al. A comparison between low-volume referring regional centers and a high-volume referral center in quality of preoperative metastasis detection in esophageal carcinoma. In: Am J Gastroenterol; 2006. p. 234-42.
20. Christian CK, Gustafson ML, Betensky RA, et al. The Leapfrog volume criteria may fall short in identifying high-quality surgical centers; 2003.
21. Padmanabhan RS, Byrnes MC, Helmer SD, et al. Should esophagectomy be performed in a low-volume center? In: Am Surg; 2002. p. 348-51; discussion 351-2.
22. Urschel JD, Urschel DM. The hospital volume-outcome relationship in general thoracic surgery. Is the surgeon the critical determinant? In: J Cardiovasc Surg (Torino); 2000. p. 153-5.
23. Birkmeyer JD, Stukel TA, Siewers AE, et al. Surgeon volume and operative mortality in the United States; 2003.
24. Liu JH, Etzioni DA, O´Connell JB, et al. Using volume criteria: do California hospitals measure up? In: J Surg Res; 2003 Jul; 2003. p. 96-101.
25. Urbach DR, Bell CM, Austin PC. Differences in operative mortality between high- and low-volume hospitals in Ontario for 5 major surgical procedures: estimating the number of lives potentially saved through regionalization; 2003.
26. Goodney PP, Siewers AE, Stukel TA, et al. Is surgery getting safer? National trends in operative mortality. J Am Coll Surg 2002 Aug;Sect. 219-27.
27. Simunovic M, Rempel E, Theriault ME, et al. Influence of hospital characteristics on operative death and survival of patients after major cancer surgery in Ontario. In: Can J Surg; 2006. p. 251-8.
29. Dudley RA, Johansen KL, Brand R, et al. Selective referral to high-volume hospitals: estimating potentially avoidable deaths. JAMA 2000;283(9):1159-66.
30. Barone JE, Tucker JB, Bull SM. The Leapfrog Initiative: a potential threat to surgical education. In: Curr Surg; 2003. p. 218-21.
31. Birkmeyer JD, Finlayson EV, Birkmeyer CM, editors. Volume standards for high-risk surgical procedures: potential benefits of the Leapfrog initiative; Surgery 2001; 130:415-22.
32. Birkmeyer JD, Dimick JB. Potential benefits of the new Leapfrog standards: effect of process and outcomes measures. Surgery 2004 Jun:569-75.
33. van Lanschot JJB, Hulscher JBF, Buskens CJ, Tilanus HW, ten Kate FJW, Obertop H. Hospital volume and hospital mortality for esophagectomy. Cancer 2001; 91:1574-8.
35. National Healthcare Quality Report. In: Agency for Healthcare Research and Quality; 2003.

**1c.9 Quote the Specific guideline recommendation (***including guideline number and/or page number***):** None

**1c.10 Clinical Practice Guideline Citation:** None
**1c.11 National Guideline Clearinghouse or other URL:** None

| | |
|---|---|
| **1c.12 Rating of strength of recommendation** (*also provide narrative description of the rating and by whom*)**:**<br>Not applicable<br><br>**1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF)***:*<br>During the comprehensive medical literature review, preference was given to high quality systematic reviews, meta-analyses, and clinical trials over the past ten years, plus existing nationally recognized treatment guidelines from the leading specialty societies.<br><br>**1c.14 Rationale for using this guideline over others:**<br>Not applicable | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Importance to Measure and Report?*** | **1** |
| **Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, met?**<br>**Rationale:** | **1**<br>**Y☐**<br>**N☐** |
| **2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES** | |
| Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (evaluation criteria) | **Eval Rating** |
| **2a. MEASURE SPECIFICATIONS** | |
| **S.1 Do you have a web page where current detailed measure specifications can be obtained?**<br>**S.2 If yes, provide web page URL:**<br><br>**2a. Precisely Specified** | |
| **2a.1 Numerator Statement** (*Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome*)**:**<br>Discharges, age 18 years and older, with ICD-9-CM code for esophageal resection in any procedure field OR gastrectomy procedure code ONLY if accompanied by selected diagnosis codes.<br><br>**2a.2 Numerator Time Window** (*The time period in which cases are eligible for inclusion in the numerator*)**:**<br>Time period is user defined. Users of the measure typically use a 12 month time period.<br><br>**2a.3 Numerator Details** (*All information required to collect/calculate the numerator, including all codes, logic, and definitions*)**:**<br>CD-9-CM esophageal resection procedure codes:<br><br>424 ESOPHAGECTOMY<br>4240 ESOPHAGECTOMY NOS<br>4241 PARTIAL ESOPHAGECTOMY<br>4242 TOTAL ESOPHAGECTOMY<br>425 THORAC ESOPHAG ANAST<br>4251 THORAC ESOPHAGOESOPHAGOS<br>4252 THORAC ESOPHAGOGASTROST<br>4253 THORAC SM BOWEL INTERPOS<br>4254 THORAC ESOPHAGOENTER NEC<br>4255 THORAC LG BOWEL INTERPOS<br>4256 THORAC ESOPHAGOCOLOS NEC<br>4258 THORAC INTERPOSITION NEC<br>4259 THORAC ESOPHAG ANAST NEC<br>426 STERN ESOPHAG ANAST | **2a-specs**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |

4261 STERN ESOPHAGOESOPHAGOST
4262 STERN ESOPHAGOGASTROSTOM
4263 STERN SM BOWEL INTERPOS
4264 STERN ESOPHAGOENTER NEC
4265 STERN LG BOWEL INTERPOS
4266 STERN ESOPHAGOCOLOS NEC
4268 STERN INTERPOSITION NEC
4269 STERN ESOPHAG ANAST NEC

OR

ICD-9-CM gastrectomy procedure code:
4399 OTHER TOTAL GASTRECTOMY

ONLY if accompanied by selected diagnosis codes
1500 MALIGNANT NEOPLASM OF ESOPHAGUS, CERVICAL
1501 MALIGNANT NEOPLASM OF ESOPHAGUS, THORACIC
1502 MALIGNANT NEOPLASM OF ESOPHAGUS, ABDOMINAL
1503 MALIGNANT NEOPLASM OF ESOPHAGUS, UPPER THIRD OF
1504 MALIGNANT NEOPLASM OF ESOPHAGUS, MIDDLE THIRD OF
1505 MALIGNANT NEOPLASM OF ESOPHAGUS, LOWER THIRD OF
1508 MALIGNANT NEOPLASM OF ESOPHAGUS, OTHER SPECIFIED PART
1509 MALIGNANT NEOPLASM OF ESOPHAGUS, UNSPECIFIED

Exclude cases:
MDC 14 (pregnancy, childbirth, and puerperium)

2a.4 **Denominator Statement (***Brief, text description of the denominator - target population being measured***):**
Not applicable

2a.5 **Target population gender:** Female, Male
2a.6 **Target population age range:** 18 and older

2a.7 **Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):**
Not applicable

2a.8 **Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
Not Applicable

2a.9 **Denominator Exclusions (***Brief text description of exclusions from the target population***):** Not Applicable

2a.10 **Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Not Applicable

2a.11 **Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
Not Applicable

2a.12-13 **Risk Adjustment Type:** No risk adjustment necessary

2a.14 **Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
Risk adjustment not applicable; volume measures are not subject to bias due to disease severity and comorbidities

| | |
|---|---|
| **2a.15-17 Detailed risk model available Web page URL or attachment:** | |
| **2a.18-19 Type of Score:** Count<br>**2a.20 Interpretation of Score:** Better quality = Higher score<br>**2a.21 Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**<br>The volume is the number of discharges with a procedure for esophageal resection | |
| **2a.22 Describe the method for discriminating performance** *(e.g., significance testing)***:**<br>Performance discrimination is based on pre-defined thresholds derived from the literature. Threshold 1: 6 or more procedures per year. Threshold 2: 7 or more procedures per year. Threshold 2: 7 or more procedures per year. | |
| **2a.23 Sampling (Survey) Methodology** *If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)*:<br>Not applicable | |
| **2a.24 Data Source (***Check the source(s) for which the measure is specified and tested)***:**<br>Electronic administrative data/claims<br><br>**2a.25 Data source/data collection instrument (***Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**<br>Hospital administrative discharge data. See data requirements in the AHRQ QI Windows Application Documentation: http://www.qualityindicators.ahrq.gov/software.htm<br><br>**2a.26-28 Data source/data collection instrument reference web page URL or attachment:** URL<br>http://www.qualityindicators.ahrq.gov/software.htm<br><br>**2a.29-31 Data dictionary/code table web page URL or attachment:** URL<br>http://www.qualityindicators.ahrq.gov/downloads/winqi/AHRQ_QI_Windows_Software_Documentation_V41a.pdf<br><br>**2a.32-35 Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*<br>Facility/Agency<br><br>**2a.36-37 Care Settings (***Check the setting(s) for which the measure is specified and tested)***:**<br>Hospital<br><br>**2a.38-41 Clinical Services** (*Healthcare services being measured, check all that apply*)<br>Clinicians: Physicians (MD/DO) | |
| **TESTING/ANALYSIS** | |
| **2b. Reliability testing**<br><br>**2b.1 Data/sample** *(description of data/sample and size)***:** Not applicable<br><br>**2b.2 Analytic Method** *(type of reliability & rationale, method for testing)***:**<br>We conduct annual measure maintenance including a review of the ICD-9-CM coding.<br><br>**2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**<br>Not applicable | **2b**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **2c. Validity testing**<br><br>**2c.1 Data/sample** *(description of data/sample and size)***:** AHRQ 2007 State Inpatient Databases (SID) 424 hospitals and 1,587 discharges<br><br>**2c.2 Analytic Method** *(type of validity & rationale, method for testing)***:**<br>We conduct annual measure maintenance including a review of the numerator inclusion and exclusion criteria and calculation of comparative data. | **2c**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |

| | |
|---|---|
| **2c.3 Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:<br>Not applicable | |
| **2d. Exclusions Justified**<br><br>**2d.1 Summary of Evidence supporting exclusion(s):**<br>Not applicable<br><br>**2d.2 Citations for Evidence:**<br>Not applicable<br><br>**2d.3 Data/sample** *(description of data/sample and size)*: Not applicable<br><br>**2d.4 Analytic Method** *(type analysis & rationale)*:<br>Not applicable<br><br>**2d.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:<br>Not applicable | **2d**<br>C☐<br>P☐<br>M☐<br>N☐<br>NA☐ |
| **2e. Risk Adjustment for Outcomes/ Resource Use Measures**<br><br>**2e.1 Data/sample** *(description of data/sample and size)*: Not applicable<br><br>**2e.2 Analytic Method** *(type of risk adjustment, analysis, & rationale)*:<br>Not applicable<br><br>**2e.3 Testing Results** *(risk model performance metrics)*:<br>Not applicable<br><br>**2e.4 If outcome or resource use measure is not risk adjusted, provide rationale:** Not applicable | **2e**<br>C☐<br>P☐<br>M☐<br>N☐<br>NA☐ |
| **2f. Identification of Meaningful Differences in Performance**<br><br>**2f.1 Data/sample from Testing or Current Use** *(description of data/sample and size)*: Not applicable<br><br>**2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*:<br>Not applicable<br><br>**2f.3 Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:<br>Hospitals that perform more esophageal resections have better outcomes. Performance discrimination is completed using pre-defined thresholds derived from the literature concerning this procedure. Threshold 1: 6 or more procedures per year. Threshold 2: 7 or more procedures per year. Threshold 2: 7 or more procedures per year. | **2f**<br>C☐<br>P☐<br>M☐<br>N☐ |
| **2g. Comparability of Multiple Data Sources/Methods**<br><br>**2g.1 Data/sample** *(description of data/sample and size)*: Not applicable<br><br>**2g.2 Analytic Method** *(type of analysis & rationale)*:<br>Not applicable<br><br>**2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*:<br>Not applicable | **2g**<br>C☐<br>P☐<br>M☐<br>N☐<br>NA☐ |
| **2h. Disparities in Care** | **2h**<br>C☐ |

| | |
|---|---|
| **2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: Not applicable<br><br>**2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:**<br>Not applicable | **P☐<br>M☐<br>N☐<br>NA☐** |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Scientific Acceptability of Measure Properties?*** | **2** |
| **Steering Committee: Overall, to what extent was the criterion, *Scientific Acceptability of Measure Properties*, met?<br>Rationale:** | **2<br>C☐<br>P☐<br>M☐<br>N☐** |
| **3. USABILITY** | |
| Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria) | **Eval Rating** |
| **3a. Meaningful, Understandable, and Useful Information**<br><br>**3a.1 Current Use:** In use<br><br>**3a.2 Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*)**:**<br>1) State of California: Hospital Inpatient Mortality Indicators for California, http://oshpd.ca.gov/HID/Products/PatDischargeData/AHRQ/iqi-imi_overview.html<br>2) Illinois Hospital Association: Illinois Hospitals Caring for You, www.illinoishospitals.org<br>3) Norton Healthcare (multi-hospital system): Norton Healthcare Quality Report, http://www.nortonhealthcare.com/body.cfm?id=157<br>4) State of New Jersey: Find and Compare Quality Care in New Jersey Hospitals, http://www.nj.gov/health/healthcarequality/<br>5) Niagara Health Quality Coalition and Alliance for Quality Health Care: New York State Hospital Report Card, http://www.myhealthfinder.com/<br>6) State of Texas: Reports on Hospital Performance, http://www.dshs.state.tx.us/thcic/<br>7) State of Vermont: Department of Banking, Insurance, Securities & Health Care Administration (BISHCA) Comparison Report, http://www.bishca.state.vt.us/health-care/hospitals-health-care-practitioners/2009-vermont-hospital-report-card<br>8) Niagara Health Quality Coalition and Alliance for Quality Health Care: Washington State Hospital Report Card, http://www.myhealthfinder.com/wa09/index.php<br>9) State of Oregon: Oregon Hospital Quality Indicators, http://egov.oregon.gov/DAS/OHPPR/HQ/HospReports.shtml<br><br>**3a.3 If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years***):**<br>University Healthcare Consortium - An alliance of 103 academic medical centers and 219 of their affiliated hospitals. Reporting the AHRQ QIs to their member hospitals. (see www.uhc.edu. Note: measure results reported to hospitals; not reported on site).<br><br>Dallas Fort Worth Hospital Council – Reporting on measure results to over 70 hospitals in Texas (see www.dfwhc.ord. Note: measure results reported to hospitals; not reported on site).<br><br>Norton Healthcare - a multi-hospital system in Kentucky (see http://www.nortonhealthcare.com/about/Our_Performance/index.aspx)<br><br>Ministry Health Care - a multi-hospital system in Wisconsin (see http://ministryhealth.org/display/router.aspx. Note: measure results reported to hospitals; not reported on | **3a<br>C☐<br>P☐<br>M☐<br>N☐** |

site).

Minnesota Hospital Association
http://www.mnhospitals.org/ Note: measure used in quality improvement. Not reported publicly by the association)

**Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*)
3a.4 **Data/sample** *(description of data/sample and size)*: The 2007 AHRQ State Inpatient Databases (SID) consist of approximatley 4,000 hospitals and 38 million discharges

3a.5 **Methods** *(e.g., focus group, survey, QI project)*:
A research team from the School of Public Affairs, Baruch College, under contracts with the Department of Public Health, Weill Medical College and Battelle, Inc., has developed a pair of Hospital Quality Model Reports at the request of the Agency for Healthcare Research & Quality (AHRQ). The AHRQ hip fracture mortality measure is included in the reports. These reports are designed specifically to report comparative information on hospital performance based on the AHRQ Quality Indicators (QIs). The work was done in close collaboration with AHRQ staff and the AHRQ Quality Indicators team.

The Model Reports (discussed immediately above) are based on:
- Extensive search and analysis of the literature on hospital quality measurement and reporting, as well as public reporting on health care quality more broadly;
- Interviews with quality measurement and reporting experts, purchasers, staff of purchasing coalitions, and executives of integrated health care delivery systems who are responsible for quality in their facilities;
- Two focus groups with chief medical officers of hospitals and/or systems and two focus groups with quality managers from a broad mix of hospitals;
- Four focus groups with members of the public who had recently experienced a hospital admission; and
- Four rounds of cognitive interviews (a total of 62 interviews) to test draft versions of the two Model Reports with members of the public with recent hospital experience, basic computer literacy but widely varying levels of education.

3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*:
Given the above review of the literature and original research that was conducted, a Model report was the result that could help sponsors use the best evidence on public reports so they are most likely to have the desired effects on quality.

**3b/3c. Relation to other NQF-endorsed measures**

3b.1 **NQF # and Title of similar or related measures:**
Leapfrog esophagectomy survival predictor (NQF # unknown)

(for NQF staff use) **Notes on similar/related endorsed or submitted measures:**

**3b. Harmonization**
If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population):
3b.2 **Are the measure specifications harmonized? If not, why?**
Yes; the Leapfrog specification is based on the AHRQ specification

**3b**
C☐
P☐
M☐
N☐
NA☐

**3c. Distinctive or Additive Value**
3c.1 **Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:**
The AHRQ volume measure is paired with a mortality measure. Together, The AHRQ measure has improved discrimination and predictive properties; the AHRQ measure also has an associated measure of uncertainty.

5.1 **If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:**

**3c**
C☐
P☐
M☐
N☐
NA☐

| | |
|---|---|
| The AHRQ volume measure is paired with a mortality measure. Together, The AHRQ measure has improved discrimination and predictive properties; the AHRQ measure also has an associated measure of uncertainty. | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability?*** | **3** |
| **Steering Committee: Overall, to what extent was the criterion, *Usability*, met?**<br>**Rationale:** | **3**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **4. FEASIBILITY** | |
| Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria) | **Eval Rating** |
| **4a. Data Generated as a Byproduct of Care Processes**<br><br>**4a.1-2 How are the data elements that are needed to compute measure scores generated?**<br>Coding/abstraction performed by someone other than person obtaining original information (E.g., DRG, ICD-9 codes on claims, chart abstraction for quality measure or registry) | **4a**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **4b. Electronic Sources**<br><br>**4b.1 Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*)<br>Yes<br><br>**4b.2 If not, specify the near-term path to achieve electronic capture by most providers.** | **4b**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **4c. Exclusions**<br><br>**4c.1 Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?**<br>No<br><br>**4c.2 If yes, provide justification.** | **4c**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐**<br>**NA☐** |
| **4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences**<br><br>**4d.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.**<br>The relative rarity of esophageal resection results in an indicator that is less precise than most volume indicators, although still highly adequate for use as a quality indicator. Hospitals should examine more than one year of data if possible and average volumes for a more precise estimate. Hospitals may also consider use with the pancreatic resection indicator, another complex cancer surgery. The volume-outcome relationship on which this indicator is based may not hold over time, as providers become more experienced or as technology changes. | **4d**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **4e. Data Collection Strategy/Implementation**<br><br>**4e.1 Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:**<br>None<br><br>**4e.2 Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:**<br>Administrative data are collected as part of the routine operations. Some staff time is required to download and execute the software from the AHRQ webs site, which is available at no cost. | **4e**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |

| | |
|---|---|
| **4e.3 Evidence for costs:**<br>User reported experiences<br><br>**4e.4 Business case documentation:** None | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Feasibility?*** | **4** |
| **Steering Committee: Overall, to what extent was the criterion, *Feasibility*, met?**<br>**Rationale:** | **4**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **RECOMMENDATION** | |
| (for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.** | **Time-limited ☐** |
| **Steering Committee: Do you recommend for endorsement?**<br>**Comments:** | **Y☐**<br>**N☐**<br>**A☐** |
| **CONTACT INFORMATION** | |
| **Co.1 Measure Steward (Intellectual Property Owner)**<br>**Co.1 Organization**<br>Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850<br><br>**Co.2 Point of Contact**<br>John, Bott, MSSW, MBA, john.bott@ahrq.hhs.gov, 301-427-1317- | |
| **Measure Developer If different from Measure Steward**<br>**Co.3 Organization**<br>Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850<br><br>**Co.4 Point of Contact**<br>John, Bott, MSSW, MBA, john.bott@ahrq.hhs.gov, 301-427-1317- | |
| **Co.5 Submitter If different from Measure Steward POC**<br>John, Bott, john.bott@ahrq.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality | |
| **Co.6 Additional organizations that sponsored/participated in measure development**<br>UC Davis<br>Stanford University<br>Battelle Memorial Institute | |
| **ADDITIONAL INFORMATION** | |
| **Workgroup/Expert Panel involved in measure development**<br>**Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.**<br>None | |
| **Ad.2 If adapted, provide name of original measure:** None<br>**Ad.3-5 If adapted, provide original specifications URL or attachment** | |
| **Measure Developer/Steward Updates and Ongoing Maintenance**<br>**Ad.6 Year the measure was first released:** 2002<br>**Ad.7 Month and Year of most recent revision:** 10, 2010<br>**Ad.8 What is your frequency for review/update of this measure?** annually<br>**Ad.9 When is the next scheduled review/update for this measure?** 05, 2011 | |

| |
|---|
| **Ad.10 Copyright statement/disclaimers:** The AHRQ QI software is publicly available. We have no copyright disclaimers. |
| **Ad.11 -13 Additional Information web page URL or attachment:** |
| **Date of Submission** (*MM*/*DD*/*YY*)**:** 12/31/2010 |