

NATIONAL QUALITY FORUM

Measure Submission and Evaluation Worksheet 5.0

This form contains the information submitted by measure developers/stewards, organized according to NQF's measure evaluation criteria and process. The evaluation criteria, evaluation guidance documents, and a blank online submission form are available on the [submitting standards web page](#).

NQF #: 0361	NQF Project: Surgery Project 2014
(for Endorsement Maintenance Review)	
Original Endorsement Date: May 15, 2008 Most Recent Endorsement Date: Dec 02, 2011 Last Updated Date: Jan 03, 2013	
BRIEF MEASURE INFORMATION	
De.1 Measure Title: Esophageal Resection Volume (IQI 1)	
Co.1.1 Measure Steward: Agency for Healthcare Research and Quality	
De.2 Brief Description of Measure: Number of discharges with a procedure for esophageal resection	
2a1.1 Numerator Statement: 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 code for esophageal cancer.	
2a1.4 Denominator Statement: Not applicable	
2a1.8 Denominator Exclusions: Not Applicable	
1.1 Measure Type: Structure 2a1. 25-26 Data Source: Claims 2a1.33 Level of Analysis: Facility	
1.2-1.4 Is this measure paired with another measure? No	
De.3 If included in a composite, please identify the composite measure (title and NQF number if endorsed): Esophageal Resection Mortality (IQI 8)	

STAFF NOTES (issues or questions regarding any criteria)
Comments on Conditions for Consideration:
Is the measure untested? Yes <input type="radio"/> No <input checked="" type="radio"/> If untested, explain how it meets criteria for consideration for time-limited endorsement:
1a. Specific national health goal/priority identified by DHHS or NPP addressed by the measure (check De.5): 5. Similar/related <u>endorsed</u> or submitted measures (check 5.1): Other Criteria:
Staff Reviewer Name(s):

1. IMPACT, OPPORTUNITY, EVIDENCE - IMPORTANCE TO MEASURE AND REPORT
Importance to Measure and Report is a threshold criterion that must be met in order to recommend a

measure for endorsement. All three subcriteria must be met to pass this criterion. See [guidance on evidence](#).

Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria. ([evaluation criteria](#))

1a. High Impact: H O M O L O I O

(The measure directly addresses a specific national health goal/priority identified by DHHS or NPP, or some other high impact aspect of healthcare.)

De.4 Subject/Topic Areas (Check all the areas that apply): [Surgery](#), [Surgery : Thoracic](#)

De.5 Non-Condition Specific (Check all the areas that apply):

1a.1 Demonstrated High Impact Aspect of Healthcare: [Severity of illness](#), [Patient/societal consequences of poor quality](#)

1a.2 If "Other," please describe:

1a.3 Summary of Evidence of High Impact (Provide epidemiologic or resource use data):

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.

1a.4 Citations for Evidence of High Impact cited in 1a.3: [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.](#)

[Owings MF, Kozak LJ. Ambulatory and inpatient procedures in the United States, 1996. Vital Health Stat 13 1998\(139\):1-119.](#)

[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.](#)

[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.](#)

[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.](#)

[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.](#)

See Guidance for Definitions of Rating Scale: H=High; M=Moderate; L=Low; I=Insufficient; NA=Not Applicable
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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: H ☐ M ☐ L ☐ I ☐

(There is a demonstrated performance gap - variability or overall less than optimal performance)

1b.1 Briefly explain the 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 less than optimal performance across providers): [**For Maintenance** – Descriptive statistics for performance results for this measure - distribution of scores for measured entities by quartile/decile, mean, median, SD, min, max, etc.] 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: [**For Maintenance** – Description of the data or sample for measure results reported in 1b.2 including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included]

AHRQ 2007 State Inpatient Databases (SID) 424 hospitals and 1,587 discharges

1b.4 Summary of Data on Disparities by Population Group: [**For Maintenance** – Descriptive statistics for performance results for this measure by population group]

Not applicable

1b.5 Citations for Data on Disparities Cited in 1b.4: [**For Maintenance** – Description of the data or sample for measure results reported in 1b.4 including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included]

Not applicable

1c. Evidence (Measure focus is a health outcome OR meets the criteria for quantity, quality, consistency of the body of evidence.)

Is the measure focus a health outcome? Yes ☐ No ☐ **If not a health outcome, rate the body of evidence.**

Quantity: H ☐ M ☐ L ☐ I ☐ Quality: H ☐ M ☐ L ☐ I ☐ Consistency: H ☐ M ☐ L ☐ I ☐

Quantity	Quality	Consistency	Does the measure pass subcriterion 1c?
M-H	M-H	M-H	Yes <input type="radio"/>
L	M-H	M	Yes <input type="radio"/> IF additional research unlikely to change conclusion that benefits to patients outweigh harms: otherwise No <input type="radio"/>
M-H	L	M-H	Yes <input type="radio"/> IF potential benefits to patients clearly outweigh potential harms: otherwise No <input type="radio"/>
L-M-H	L-M-H	L	No <input type="radio"/>
Health outcome – rationale supports relationship to at least one healthcare structure, process, intervention, or service			Does the measure pass subcriterion 1c? Yes <input type="radio"/> IF rationale supports relationship

1c.1 Structure-Process-Outcome Relationship (Briefly state the measure focus, e.g., health outcome,

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intermediate clinical outcome, process, structure; then identify the appropriate links, e.g., structure-process-health outcome; process- health outcome; intermediate clinical outcome-health outcome):

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 (Check all that apply):

Systematic synthesis of research

1c.4 Directness of Evidence to the Specified Measure (State the central topic, population, and outcomes addressed in the body of evidence and identify any differences from the measure focus and measure target population):

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

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 ($p < .001$), a 3-day reduction in median intensive care unit stay ($p < .001$), 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 Quantity of Studies in the Body of Evidence *(Total number of studies, not articles):*

1c.6 Quality of Body of Evidence *(Summarize the certainty or confidence in the estimates of benefits and harms to patients across studies in the body of evidence resulting from study factors. Please address: a) study design/flaws; b) directness/indirectness of the evidence to this measure (e.g., interventions, comparisons, outcomes assessed, population included in the evidence); and c) imprecision/wide confidence intervals due to few patients or events):*

1c.7 Consistency of Results across Studies *(Summarize the consistency of the magnitude and direction of the effect):*

1c.8 Net Benefit *(Provide estimates of effect for benefit/outcome; identify harms addressed and estimates of effect; and net benefit - benefit over harms):*

1c.9 Grading of Strength/Quality of the Body of Evidence. Has the body of evidence been graded?

1c.10 If body of evidence graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias:

1c.11 System Used for Grading the Body of Evidence: Not applicable

1c.12 If other, identify and describe the grading scale with definitions:

1c.13 Grade Assigned to the Body of Evidence: Not applicable

1c.14 Summary of Controversy/Contradictory Evidence: None

1c.15 Citations for Evidence other than Guidelines *(Guidelines addressed below):*

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.16 Quote verbatim, the specific guideline recommendation (Including guideline # and/or page #):
 None

1c.17 Clinical Practice Guideline Citation: None

1c.18 National Guideline Clearinghouse or other URL: None

1c.19 Grading of Strength of Guideline Recommendation. Has the recommendation been graded?

1c.20 If guideline recommendation graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias:

1c.21 System Used for Grading the Strength of Guideline Recommendation: 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.

1c.22 If other, identify and describe the grading scale with definitions:

1c.23 Grade Assigned to the Recommendation: Not applicable

1c.24 Rationale for Using this Guideline Over Others: Not applicable

Based on the NQF descriptions for rating the evidence, what was the developer's assessment of the quantity, quality, and consistency of the body of evidence?

1c.25 Quantity: 1c.26 Quality: 1c.27 Consistency:

1c.28 Attach evidence submission form:

1c.29 Attach appendix for supplemental materials:

Was the threshold criterion, *Importance to Measure and Report*, met?

(1a & 1b must be rated moderate or high and 1c yes) Yes ☐ No ☒

Provide rationale based on specific subcriteria:

For a new measure if the Committee votes NO, then STOP.

For a measure undergoing endorsement maintenance, if the Committee votes NO because of 1b. (no opportunity for improvement), it may be considered for continued endorsement and all criteria need to be evaluated.

2. RELIABILITY & VALIDITY - 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)**

Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. Testing information and results should be entered in the appropriate field. Supplemental materials may be referenced or attached in item 2.1. See [guidance on measure testing](#).

S.1 Measure Web Page (*In the future, NQF will require measure stewards to provide a URL link to a web page where current detailed specifications can be obtained*). Do you have a web page where current detailed specifications for this measure can be obtained? [Yes](#)

S.2 If yes, provide web page URL:

<http://www.qualityindicators.ahrq.gov/downloads/iqi/TechSpecs42/IQI%2001%20Esophageal%20Resection%20Volume.pdf>

2a. RELIABILITY. Precise Specifications and Reliability Testing: H● M● L● I●

2a1. Precise Measure Specifications. (*The measure specifications precise and unambiguous.*)

2a1.1 Numerator Statement (*Brief, narrative description of the measure focus or what is being measured about the target population, e.g., cases from the target population with the target process, condition, event, or outcome*):

[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 code for esophageal cancer.](#)

2a1.2 Numerator Time Window (*The time period in which the target process, condition, event, or outcome is eligible for inclusion*):

[Time period is user defined. Users of the measure typically use a 12 month time period.](#)

2a1.3 Numerator Details (*All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, codes with descriptors, and/or specific data collection items/responses*):

[ICD-9-CM esophageal resection procedure codes:](#)

424 ESOPHAGECTOMY
 4240 ESOPHAGECTOMY NOS
 4241 PARTIAL ESOPHAGECTOMY
 4242 TOTAL ESOPHAGECTOMY
 425 THORAC ESOPHAG ANAST
 4251 THORAC ESOPHAGUESOPHAGOS
 4252 THORAC ESOPHAGOGASTROST
 4253 THORAC SM BOWEL INTERPOS
 4254 THORAC ESOPHAGOENTER NEC
 4255 THORAC LG BOWEL INTERPOS
 4256 THORAC ESOPHAGOCOLOS NEC
 4258 THORAC INTERPOSITION NEC
 4259 THORAC ESOPHAG ANAST NEC
 426 STERN ESOPHAG ANAST
 4261 STERN ESOPHAGUESOPHAGOST
 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 TOTAL GASTRECTOMY NEC

ONLY if accompanied by esophageal cancer diagnosis codes

1500 MAL NEO CERVICAL ESOPHAG
 1501 MAL NEO THORACIC ESOPHAG
 1502 MAL NEO ABDOMIN ESOPHAG
 1503 MAL NEO UPPER 3RD ESOPH
 1504 MAL NEO MIDDLE 3RD ESOPH
 1505 MAL NEO LOWER 3RD ESOPH
 1508 MAL NEO ESOPHAGUS NEC
 1509 MAL NEO ESOPHAGUS NOS

Exclude cases:

- MDC 14 (pregnancy, childbirth, and puerperium)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

2a1.4 Denominator Statement (Brief, narrative description of the target population being measured):
 Not applicable

2a1.5 Target Population Category (Check all the populations for which the measure is specified and tested if any): Adult/Elderly Care, Elderly

2a1.6 Denominator Time Window (The time period in which cases are eligible for inclusion):
 Not applicable

2a1.7 Denominator Details (All information required to identify and calculate the target population/denominator such as definitions, codes with descriptors, and/or specific data collection items/responses):
 Not Applicable

2a1.8 Denominator Exclusions (Brief narrative description of exclusions from the target population):
 Not Applicable

2a1.9 Denominator Exclusion Details (All information required to identify and calculate exclusions from the denominator such as definitions, codes with descriptors, and/or specific data collection items/responses):
 Not Applicable

2a1.10 Stratification Details/Variables (All information required to stratify the measure results including the stratification variables, codes with descriptors, definitions, and/or specific data collection items/responses):
 Not Applicable

2a1.11 Risk Adjustment Type (Select type. Provide specifications for risk stratification in 2a1.10 and for statistical model in 2a1.13): No risk adjustment or risk stratification **2a1.12 If "Other," please describe:**

2a1.13 Statistical Risk Model and Variables (Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development should be addressed in 2b4.):
 Risk adjustment not applicable; volume measures are not subject to bias due to disease severity and comorbiditiesNot applicable

2a1.14-16 Detailed Risk Model Available at Web page URL (or attachment). Include coefficients,

equations, codes with descriptors, definitions, and/or specific data collection items/responses. Attach documents only if they are not available on a webpage and keep attached file to 5 MB or less. NQF strongly prefers you make documents available at a Web page URL. Please supply login/password if needed:

2a1.17-18. Type of Score: [Count](#)

2a1.19 Interpretation of Score (*Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score*):
[Better quality = Higher score](#)

2a1.20 Calculation Algorithm/Measure Logic(*Describe the calculation of the measure score as an ordered sequence of steps including identifying the target population; exclusions; cases meeting the target process, condition, event, or outcome; aggregating data; risk adjustment; etc.*):
[The volume is the number of discharges with a procedure for esophageal resection](#)

2a1.21-23 Calculation Algorithm/Measure Logic Diagram URL or attachment:

2a1.24 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):
[Not applicable](#)

2a1.25 Data Source (*Check all the sources for which the measure is specified and tested*). If other, please describe:
[Claims](#)

2a1.26 Data Source/Data Collection Instrument (*Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.*): [Hospital administrative discharge data. See data requirements in the AHRQ QI Windows Application Documentation:
http://www.qualityindicators.ahrq.gov/software.htm](#)

2a1.27-29 Data Source/data Collection Instrument Reference Web Page URL or Attachment: [URL
http://www.qualityindicators.ahrq.gov/software.htm](#)

2a1.30-32 Data Dictionary/Code Table Web Page URL or Attachment:
[URL
http://www.qualityindicators.ahrq.gov/downloads/winqi/AHRQ_QI_Windows_Software_Documentation_V41a.pdf](#)

2a1.33 Level of Analysis (*Check the levels of analysis for which the measure is specified and tested*):
[Facility](#)

2a1.34-35 Care Setting (*Check all the settings for which the measure is specified and tested*):
[Inpatient/Hospital](#)

2a2. Reliability Testing. *(Reliability testing was conducted with appropriate method, scope, and adequate demonstration of reliability.)*

2a2.1 Data/Sample *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):*

Not applicable

2a2.2 Analytic Method *(Describe method of reliability testing & rationale):*

We conduct annual measure maintenance including a review of the ICD-9-CM coding.

2a2.3 Testing Results *(Reliability statistics, assessment of adequacy in the context of norms for the test conducted):*

Not applicable

2b. VALIDITY. Validity, Testing, including all Threats to Validity: H● M● L● I●

2b1.1 Describe how the measure specifications *(measure focus, target population, and exclusions) are consistent with the evidence cited in support of the measure focus (criterion 1c) and identify any differences from the evidence:*

2b2. Validity Testing. *(Validity testing was conducted with appropriate method, scope, and adequate demonstration of validity.)*

2b2.1 Data/Sample *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):*

AHRQ 2007 State Inpatient Databases (SID) 424 hospitals and 1,587 discharges

2b2.2 Analytic Method *(Describe method of validity testing and rationale; if face validity, describe systematic assessment):*

We conduct annual measure maintenance including a review of the numerator inclusion and exclusion criteria and calculation of comparative data.

2b2.3 Testing Results *(Statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment):*

Not applicable

POTENTIAL THREATS TO VALIDITY. *(All potential threats to validity were appropriately tested with adequate results.)*

2b3. Measure Exclusions. *(Exclusions were supported by the clinical evidence in 1c or appropriately tested with results demonstrating the need to specify them.)*

2b3.1 Data/Sample for analysis of exclusions *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):*

Not applicable

2b3.2 Analytic Method *(Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference):*

Not applicable

2b3.3 Results *(Provide statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses):*

Not applicable

2b4. Risk Adjustment Strategy. *(For outcome measures, adjustment for differences in case mix (severity) across measured entities was appropriately tested with adequate results.)*

2b4.1 Data/Sample (Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):

Not applicable

2b4.2 Analytic Method (Describe methods and rationale for development and testing of risk model or risk stratification including selection of factors/variables):

Not applicable

2b4.3 Testing Results (*Statistical risk model: Provide quantitative assessment of relative contribution of model risk factors; risk model performance metrics including cross-validation discrimination and calibration statistics, calibration curve and risk decile plot, and assessment of adequacy in the context of norms for risk models. Risk stratification: Provide quantitative assessment of relationship of risk factors to the outcome and differences in outcomes among the strata*):

Not applicable

2b4.4 If outcome or resource use measure is not risk adjusted, provide rationale and analyses to justify lack of adjustment: Not applicable

2b5. Identification of Meaningful Differences in Performance. (The performance measure scores were appropriately analyzed and discriminated meaningful differences in quality.)

2b5.1 Data/Sample (Describe the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):

Not applicable

2b5.2 Analytic Method (Describe methods and rationale to identify statistically significant and practically/meaningfully differences in performance):

Not applicable

2b5.3 Results (Provide measure performance results/scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningful differences in performance):

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.

2b6. Comparability of Multiple Data Sources/Methods. (If specified for more than one data source, the various approaches result in comparable scores.)

2b6.1 Data/Sample (Describe the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included):

Not applicable

2b6.2 Analytic Method (Describe methods and rationale for testing comparability of scores produced by the different data sources specified in the measure):

Not applicable

2b6.3 Testing Results (Provide statistical results, e.g., correlation statistics, comparison of rankings; assessment of adequacy in the context of norms for the test conducted):

Not applicable

2c. Disparities in Care: H M L I NA (If applicable, the measure specifications allow identification of disparities.)

2c.1 If measure is stratified for disparities, provide stratified results (Scores by stratified

categories/cohorts): [Not applicable](#)

2c.2 If disparities have been reported/identified (e.g., in 1b), but measure is not specified to detect disparities, please explain:

[Not applicable](#)

2.1-2.3 Supplemental Testing Methodology Information:

Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, met? (*Reliability and Validity must be rated moderate or high*) Yes ☒ No ☒
Provide rationale based on specific subcriteria:

If the Committee votes No, STOP

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**)

C.1 Intended Actual/Planned Use (*Check all the planned uses for which the measure is intended*): [Public Reporting](#), [Quality Improvement \(Internal to the specific organization\)](#)

3.1 Current Use (*Check all that apply; for any that are checked, provide the specific program information in the following questions*):

3a. Usefulness for Public Reporting: H ☒ M ☒ L ☒ I ☒
(The measure is meaningful, understandable and useful for public reporting.)

3a.1. Use in Public Reporting - disclosure of performance results to the public at large (*If used in a public reporting program, provide name of program(s), locations, Web page URL(s)). If not publicly reported in a national or community program, state the reason AND plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement: **[For Maintenance** – *If not publicly reported, describe progress made toward achieving disclosure of performance results to the public at large and expected date for public reporting; provide rationale why continued endorsement should be considered.*]*

- 1) State of California: Hospital Inpatient Mortality Indicators for California, http://oshpd.ca.gov/HID/Products/PatDischargeData/AHRQ/iqi-imi_overview.html
- 2) Illinois Hospital Association: Illinois Hospitals Caring for You, www.illinoishospitals.org
- 3) Norton Healthcare (multi-hospital system): Norton Healthcare Quality Report, <http://www.nortonhealthcare.com/body.cfm?id=157>
- 4) State of New Jersey: Find and Compare Quality Care in New Jersey Hospitals, <http://www.nj.gov/health/healthcarequality/>
- 5) Niagara Health Quality Coalition and Alliance for Quality Health Care: New York State Hospital Report Card, <http://www.myhealthfinder.com/>
- 6) State of Texas: Reports on Hospital Performance, <http://www.dshs.state.tx.us/thcic/>
- 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>
- 8) Niagara Health Quality Coalition and Alliance for Quality Health Care: Washington State Hospital Report Card, <http://www.myhealthfinder.com/wa09/index.php>

9) State of Oregon: Oregon Hospital Quality Indicators,
<http://egov.oregon.gov/DAS/OHPPR/HQ/HospReports.shtml>

3a.2. Provide a rationale for why the measure performance results are meaningful, understandable, and useful for public reporting. If usefulness was demonstrated (e.g., focus group, cognitive testing), describe the data, method, and results:

3.2 Use for other Accountability Functions (payment, certification, accreditation). If used in a public accountability program, provide name of program(s), locations, Web page URL(s): [University Healthcare Consortium - An alliance of 103 academic medical centers and 219 of their affiliated hospitals. Reporting the AHRQ QIs to their member hospitals. \(see www.uhc.edu. Note: measure results reported to hospitals; not reported on site\).](#)

[Dallas Fort Worth Hospital Council – Reporting on measure results to over 70 hospitals in Texas \(see www.dfwhc.org. Note: measure results reported to hospitals; not reported on site\).](#)

[Norton Healthcare - a multi-hospital system in Kentucky \(see http://www.nortonhealthcare.com/about/Our_Performance/index.aspx\)](#)

[Ministry Health Care - a multi-hospital system in Wisconsin \(see http://ministryhealth.org/display/router.aspx. Note: measure results reported to hospitals; not reported on site\).](#)

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

3b. Usefulness for Quality Improvement: H M L I
(The measure is meaningful, understandable and useful for quality improvement.)

3b.1. Use in QI. If used in quality improvement program, provide name of program(s), locations, Web page URL(s):

[For Maintenance – *If not used for QI, indicate the reasons and describe progress toward using performance results for improvement].*

3b.2. Provide rationale for why the measure performance results are meaningful, understandable, and useful for quality improvement. If usefulness was demonstrated (e.g., QI initiative), describe the data, method and results:

Overall, to what extent was the criterion, Usability, met? H M L I
Provide rationale based on specific subcriteria:

4. FEASIBILITY

Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. **(evaluation criteria)**

4a. Data Generated as a Byproduct of Care Processes: H M L I

4a.1-2 How are the data elements needed to compute measure scores generated? *(Check all that apply).*

Data used in the measure are:

[Coded by someone other than person obtaining original information \(e.g., DRG, ICD-9 codes on claims\)](#)

See Guidance for Definitions of Rating Scale: H=High; M=Moderate; L=Low; I=Insufficient; NA=Not Applicable
 Created on: 05/25/2021 at 08:43 AM

4b. Electronic Sources: H ☐ M ☒ L ☐ I ☐

4b.1 Are the data elements needed for the measure as specified available electronically (*Elements that are needed to compute measure scores are in defined, computer-readable fields*): [Yes](#)

4b.2 If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources:

4c. Susceptibility to Inaccuracies, Errors, or Unintended Consequences: H ☐ M ☒ L ☐ I ☐

4c.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to prevent, minimize, or detect. If audited, provide results:

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. Data Collection Strategy/Implementation: H ☐ M ☒ L ☐ I ☐

A.2 Please check if either of the following apply (*regarding proprietary measures*):

4d.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 and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues (*e.g., fees for use of proprietary measures*):

[None](#)

Overall, to what extent was the criterion, *Feasibility*, met? H ☐ M ☒ L ☐ I ☐
Provide rationale based on specific subcriteria:

OVERALL SUITABILITY FOR ENDORSEMENT

Does the measure meet all the NQF criteria for endorsement? Yes ☒ No ☐

Rationale:

If the Committee votes No, STOP.

If the Committee votes Yes, the final recommendation is contingent on comparison to related and competing measures.

5. COMPARISON TO RELATED AND COMPETING MEASURES

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure before a final recommendation is made.

5.1 If there are related measures (*either same measure focus or target population*) or competing measures (*both the same measure focus and same target population*), list the NQF # and title of all related and/or competing measures:

[0737 : Survival Predictor for Esophagectomy Surgery](#)

5a. Harmonization

5a.1 If this measure has EITHER the same measure focus OR the same target population as [NQF-endorsed measure\(s\)](#): Are the measure specifications completely harmonized?

5a.2 If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden:

5b. Competing Measure(s)

5b.1 If this measure has both the same measure focus and the same target population as NQF-endorsed measure(s):

Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible):

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.

Related Measures: Leapfrog esophagectomy survival predictor (NQF # unknown)

CONTACT INFORMATION

Co.1 Measure Steward (Intellectual Property Owner): Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850

Co.2 Point of Contact: Pamela, Owens, PhD, Pam.Owens@ahrq.hhs.gov, 301-427-1412-

Co.3 Measure Developer if different from Measure Steward: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850

Co.4 Point of Contact: John, Bott, MSSW, MBA, john.bott@ahrq.hhs.gov, 301-427-1317-

Co.5 Submitter: Mamatha, Pancholi, MS, Mamatha.Pancholi@ahrq.hhs.gov, 301-427-1470-, Agency for Healthcare Research and Quality

Co.6 Additional organizations that sponsored/participated in measure development:
UC Davis
Stanford University
Battelle Memorial Institute

Co.7 Public Contact: John, Bott, MSSW, MBA, john.bott@ahrq.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development

Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.
None

Ad.2 If adapted, provide title of original measure, NQF # if endorsed, and measure steward. Briefly describe the reasons for adapting the original measure and any work with the original measure steward: None

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.3 Year the measure was first released: 2002 Ad.4 Month and Year of most recent revision: 10, 2010 Ad.5 What is your frequency for review/update of this measure? annually Ad.6 When is the next scheduled review/update for this measure? 05, 2011
Ad.7 Copyright statement: The AHRQ QI software is publicly available. We have no copyright disclaimers.
Ad.8 Disclaimers:
Ad.9 Additional Information/Comments:
Date of Submission (MM/DD/YY): 10/26/2010