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 #:** OT3-028-10 **NQF Project:** Patient Outcomes Measures: Child Health and Mental Health (Phase III)
MEASURE DESCRIPTIVE INFORMATION
De.1 Measure Title: Standardized mortality ratio for neonates undergoing non-cardiac surgery
De.2 Brief description of measure*:* Ratio of observed to expected rate of in-hospital mortality following non-cardiac surgery among infants <= 30 days of age, risk-adjusted.
1.1-2 Type of Measure: Outcome **De.3 If included in a composite or paired with another measure, please identify composite or paired measure**
De.4 National Priority Partners Priority Area: Safety **De.5 IOM Quality Domain**: Effectiveness **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.* **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 **A.2 Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:** **A.3 Measure Steward Agreement:** Agreement will be signed and submitted prior to or at the time of measure submission **A.4 Measure Steward Agreement attached:** NQF Measure Stewards-634006417122480685.pdf	**A** **Y** ☐ **N** ☐
B. The measure owner/steward verifies there is an identified responsible entity and process to maintain and	**B**

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	Y☐ N☐
C. The intended use of the measure includes both public reporting and quality improvement. ►**Purpose:** Public reporting, Internal quality improvement	C Y☐ 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. D.1**Testing:** No, testing will be completed within 24 months D.2 **Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?** Yes	D Y☐ N☐
(for NQF staff use**)** **Have all conditions for consideration been met?** **Staff Notes to Steward** (*if submission returned*)**:**	**Met** Y☐ 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) **1a. High Impact**	Eval Rating
(for NQF staff use) Specific NPP goal:	
1a.1 Demonstrated High Impact Aspect of Healthcare: Leading cause of morbidity/mortality **1a.2** **1a.3 Summary of Evidence of High Impact:** Compared to an adult population, surgery in neonates is rare. However, with advances in neonatal care it is increasingly used to address a wide variety of congenital and acquired conditions. Such interventions have significant risks of morbidity and mortality. To date, investigations typically involve a specific disease entity such as congenital diaphragmatic hernia, necrotizing enterocolitis, gastroschisis or infant lung pathology requiring resection. **1a.4 Citations for Evidence of High Impact:** Mettauer NL, Pierce CM, Cassidy JV, Kiely EM, Petros AJ. One-year survival in congenital diaphragmatic hernia, 1995-2006. Arch Dis Child. 2009;94(5):407. Sangkhathat S, Patrapinyokul S, Tadtayathikom K, Osatakul S. Peri-operative factors predicting the outcome of hepatic porto-enterostomy in infants with biliary atresia. J Med Assoc Thai. 2003;86(3):224-31. Arnold MA, Chang DC, Nabaweesi R, Colombani PM, Bathurst MA, Mon KS, Hosmane S, Abdullah F. Risk stratification of 4344 patients with gastroschisis into simple and complex categories. J Pediatr Surg. 2007;42(9):1520-5. Aspirot A, Puligandla PS, Bouchard S, Su W, Flageole H, Laberge JM. A contemporary evaluation of surgical outcome in neonates and infants undergoing lung resection. J Pediatr Surg. 2008;43(3):508-12. Fisher JC, Jefferson RA, Arkovitz MS, Stolar CJ. Redefining outcomes in right congenital diaphragmatic	**1a** C☐ P☐ M☐ N☐

hernia. J Pediatr Surg. 2008;43(2):373-9.
Grushka JR, Laberge JM, Puligandla P, Skarsgard ED, Canadian Pediatric Surgery N. Effect of hospital case volume on outcome in congenital diaphragmatic hernia: the experience of the Canadian Pediatric Surgery Network. J Pediatr Surg. 2009;44(5):873-6.
Ameh EA. Morbidity and mortality of inguinal hernia in the newborn. Niger Postgrad Med J. 2002;9(4):233-4.
Kurscheid T, Holschneider AM. Necrotizing enterocolitis (NEC)--mortality and long-term results. Eur J Pediatr Surg. 1993;3(3):139-43.

1b. Opportunity for Improvement

1b.1 Benefits (improvements in quality) envisioned by use of this measure: Non-cardiac neonatal surgery is performed in a variety of settings and for a broad spectrum of diseases. The number of operations for a specific disease entity is relatively low making meaningful comparisons between various populations or health-care systems difficult. A risk-adjustment method for newborns undergoing non-cardiac surgery allows an assessment of a wide variety of surgical procedures and thereby permits comparisons of in-hospital mortality of large groups by adjusting for case mix complexity. Understanding the variation is critical to guide quality improvement.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
Mortality associated with neonatal and infant surgery varies across institutions, surgeons, and other patient groups.

1b.3 Citations for data on performance gap:
Grushka JR, Laberge JM, Puligandla P, Skarsgard ED, Canadian Pediatric Surgery N. Effect of hospital case volume on outcome in congenital diaphragmatic hernia: the experience of the Canadian Pediatric Surgery Network. J Pediatr Surg. 2009;44(5):873-6.
Arnold MA, Chang DC, Nabaweesi R, Colombani PM, Bathurst MA, Mon KS, Hosmane S, Abdullah F. Risk stratification of 4344 patients with gastroschisis into simple and complex categories. J Pediatr Surg. 2007;42(9):1520-5.
Javid PJ, Jaksic T, Skarsgard ED, Lee S, Canadian Neonatal N. Survival rate in congenital diaphragmatic hernia: the experience of the Canadian Neonatal Network. J Pediatr Surg. 2004;39(5):657-60.
Blakely ML, Tyson JE, Lally KP, McDonald S, Stoll BJ, Stevenson DK, Poole WK, Jobe AH, Wright LL, et al. Laparotomy versus peritoneal drainage for necrotizing enterocolitis or isolated intestinal perforation in extremely low birth weight infants: outcomes through 18 months adjusted age. Pediatrics. 2006;117(4):e680-7.

1b.4 Summary of Data on disparities by population group:
N/A

1b.5 Citations for data on Disparities:
N/A

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*)**:** Compared to an adult population, surgery in neonates is rare. However, with advances in neonatal care it is increasingly used to address a wide variety of congenital and acquired conditions. Such interventions have significant risks of morbidity and mortality.

1c.2-3. Type of Evidence:

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
N/A

1c
C☐ P☐ M☐ N☐

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):** N/A **1c.6 Method for rating evidence:** N/A **1c.7 Summary of Controversy/Contradictory Evidence:** N/A **1c.8 Citations for Evidence (***other than guidelines***):** N/A **1c.9 Quote the Specific guideline recommendation (***including guideline number and/or page number***):** N/A **1c.10 Clinical Practice Guideline Citation:** N/A **1c.11 National Guideline Clearinghouse or other URL:** N/A **1c.12 Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):** N/A **1c.13 Method for rating strength of recommendation** (*If different from* USPSTF system, *also describe rating and how it relates to USPSTF)*: N/A **1c.14 Rationale for using this guideline over others:** N/A	
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?** **Rationale:**	**1** **Y☐** **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? **S.2 If yes, provide web page URL:** **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***):** Cases of non-cardiac surgery among infants <= 30 days of age resulting in in-hospital death. **2a.2 Numerator Time Window (***The time period in which cases are eligible for inclusion in the numerator***):** Not pre-specified, but a minimum of one year is recommended. **2a.3 Numerator Details (***All information required to collect/calculate the numerator, including all codes, logic, and definitions***):** Number of cases of non-cardiac surgery among infants <= 30 days of age undergoing one of 63 eligible procedures where patient disposition is death prior to hospital discharge. Eligible Surgical Procedures:	**2a-specs** **C☐** **P☐** **M☐** **N☐**

ICD-9-CM procedure codes are listed with each surgical procedure.

02.12 Other repair of cerebral meninges
02.2 Ventriculostomy
02.34 Ventricular shunt to abdominal cavity and organs
02.42 Replacement of ventricular shunt
03.51 Repair of spinal meningocele
03.52 Repair of spinal myelomeninigocele
18.29 Excision or destruction of other lesion of external ear (not preauricular sinus)
25.91 Lingual frenotomy
25.92 Lingual frenectomy
27.54 Repair of cleft lip
31.73 Closure of other fistula of trachea (tracheoesophageal fistulectomy)
33.1 Incision of lung
33.93 Puncture of lung
34.09 Other incision of pleura
43.11 Percutaneous endoscopic gastrostomy
43.19 Other gastrostomy
43.3 Pyloromyotomy
44.29 Other pyloroplasty (revision of pylorus)
44.66 Other procedures for creation of esophagogastric sphincteric competence
45.02 Other incision of small intestine (not duodenum)
45.26 Open biopsy of large intestine
45.62 Other partial resection of small intestine (duodenectomy, ileectomy, jejunectomy)
45.73 Right hemicolectomy (ileocolectomy, right radical colectomy)
45.76 Sigmoidectomy
45.79 Other partial excision of large intestine (enterocolectomy NEC)
45.91 Small-to-small intestinal anastomosis
46.01 Exteriorization of small intestine (loop ileostomy)
46.03 Exteriorization of large intestine
46.10 Colostomy, not otherwise specified
46.11 Temporary colostomy
46.13 Other permanent colostomy
46.20 Ileostomy, not otherwise specified
46.21 Temporary ileostomy
46.39 Other enterostomy (duodenostomy, feeding enterostomy)
46.51 Closure of stoma of small intestine
46.79 Other repair of intestine (duodenoplasty)
46.81 Intra-abdominal manipulation of small intestine
47.09 Other appendectomy (not laparoscopic)
48.25 Open biopsy of rectum
48.41 Soave submucosal resection of rectum
48.49 Other pull-through resection of rectum
49.79 Other repair of anal sphincter (repair of old obstetric laceration of anus)
53.02 Repair of indirect inguinal hernia
53.10 Bilateral repair of inguinal hernia, not otherwise specified
53.12 Bilateral repair of indirect inguinal hernia
53.49 Other umbilical herniorrhaphy (not with prosthesis)
53.7 Repair of diaphragmatic hernia, abdominal approach
53.80 Repair of diaphragmatic hernia with thoracic approach, not otherwise specified
54.11 Exploratory laparotomy
54.12 Reopening of recent laparotomy site
54.21 Laparoscopy (peritoneoscopy)
54.3 Excision or destruction of lesion or tissue of abdominal wall or umbilicus (debridement of abdominal wall, omphalectomy)
54.59 Other lysis of peritoneal adhesions (not laparoscopic)
54.71 Repair of gastroschisis

54.72 Other repair of abdominal wall
54.95 Incision of peritoneum
62.3 Unilateral orchiectomy
62.5 Orchiopexy
64.49 Other repair of penis
64.91 Dorsal or lateral slit of prepuce
64.92 Incision of penis
64.93 Division of penile adhesions
84.03 Amputation through hand

2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured***):**
Total cases of non-cardiac surgery among infants <= 30 days of age.

2a.5 Target population gender: Male, Female
2a.6 Target population age range: Age <= 30 days at time of surgery.

2a.7 Denominator Time Window (*The time period in which cases are eligible for inclusion in the denominator***):**
Not pre-specified, but a minimum of one year is recommended.

2a.8 Denominator Details (*All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
Number of cases of non-cardiac surgery among infants <= 30 days of age undergoing one of 63 eligible procedures. See below for eligible procedures.

Eligible Surgical Procedures:

ICD-9-CM procedure codes are listed with each surgical procedure.

02.12 Other repair of cerebral meninges
02.2 Ventriculostomy
02.34 Ventricular shunt to abdominal cavity and organs
02.42 Replacement of ventricular shunt
03.51 Repair of spinal meningocele
03.52 Repair of spinal myelomeninigocele
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43.19 Other gastrostomy
43.3 Pyloromyotomy
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45.02 Other incision of small intestine (not duodenum)
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45.62 Other partial resection of small intestine (duodenectomy, ileectomy, jejunectomy)
45.73 Right hemicolectomy (ileocolectomy, right radical colectomy)
45.76 Sigmoidectomy
45.79 Other partial excision of large intestine (enterocolectomy NEC)
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46.01 Exteriorization of small intestine (loop ileostomy)
46.03 Exteriorization of large intestine
46.10 Colostomy, not otherwise specified

46.11 Temporary colostomy
46.13 Other permanent colostomy
46.20 Ileostomy, not otherwise specified
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46.39 Other enterostomy (duodenostomy, feeding enterostomy)
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54.11 Exploratory laparotomy
54.12 Reopening of recent laparotomy site
54.21 Laparoscopy (peritoneoscopy)
54.3 Excision or destruction of lesion or tissue of abdominal wall or umbilicus (debridement of abdominal wall, omphalectomy)
54.59 Other lysis of peritoneal adhesions (not laparoscopic)
54.71 Repair of gastroschisis
54.72 Other repair of abdominal wall
54.95 Incision of peritoneum
62.3 Unilateral orchiectomy
62.5 Orchiopexy
64.49 Other repair of penis
64.91 Dorsal or lateral slit of prepuce
64.92 Incision of penis
64.93 Division of penile adhesions
84.03 Amputation through hand

2a.9 Denominator Exclusions (*Brief text description of exclusions from the target population***):** Patients > 30 days of age at time of surgery; those undergoing cardiac surgery or having a major structural cardiac defect (excluding atrial and ventricular septal defects and patent ductus arteriosus); premature infants; neonates undergoing procedures which were endoscopic or closed; catheterizations; circumcisions; and sutures of superficial lacerations.

2a.10 Denominator Exclusion Details (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Neonates undergoing cardiac surgery are excluded because a risk adjustment method for congenital heart surgery already exists. Premature infants are defined as < 37 weeks gestation. Other excluded procedures are: endoscopy (through natural anatomic openings, through previously made stomas, endoscopic procedures, endoscopic biopsies); closed (percutaneous) biopsies; closed reductions; sutures of superficial lacerations; catheterizations; dilations; injections; aspirations; radiologic procedures; dental extractions; laser/cryo/photocoagulation therapies; circumcisons; incidental procedures.

2a.11 Stratification Details/Variables (*All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
N/A

2a.12-13 Risk Adjustment Type: Case-mix adjustment

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
Variables are procedure risk category, any serious respiratory condition, and necrotizing enterocolitis.

Details are provided in attachment Item 2a.15.

2a.15-17 Detailed risk model available Web page URL or attachment: Attachment Item 2a.15 Risk Adjustment-634021885111244254.doc

2a.18-19 Type of Score: Ratio
2a.20 Interpretation of Score:
2a.21 Calculation Algorithm (*Describe the calculation of the measure as a flowchart or series of steps***):**
The measure is a standardized mortality ratio for infants <= 30 days of age undergoing non-cardiac surgery.

It is defined as the ratio of observed to expected rates of in-hospital mortality. This technique allows computation of an overall risk-adjusted measure of performance for groups of patients.

To begin, the observed mortality rate is calculated for each group. This is defined as the number of cases of non-cardiac surgery resulting in in-hospital death divided by the total number of cases of non-cardiac surgery.

Next, the expected mortality rate is calculated for each group. To do this, a multivariable logistic regression model with outcome in-hospital death is fitted. Three variables are incorporated as covariates: procedure risk categories 2, 3, and 4 as binary covariates, with category 1 as the reference group; presence of a serious respiratory condition; and presence of necrotizing enterocolitis. This logistic model is used to calculate the predicted probability of death for each individual case in the data set. The average predicted probability of death for all cases in a group, calculated by summing the predicted probabilities for each case and dividing by the total number of cases, represents the expected mortality rate for the group, adjusting for case mix.

The standardized mortality ratio (SMR) is then calculated as the observed mortality rate divided by the expected mortality rate.

If the observed mortality rate for a group is higher than expected, meaning that the group performs worse than would be expected given its case mix, the SMR is greater than 1. If the observed mortality rate for a group is lower than would be expected, indicating better than anticipated performance, the SMR is less than 1.

Reference:
Son JK, Lillehei CW, Gauvreau K, Jenkins KJ. A risk adjustment method for newborns undergoing noncardiac surgery. Annals of Surgery, in press.

2a.22 Describe the method for discriminating performance *(e.g., significance testing)***:**
In addition to standardized mortality ratios, 95% confidence intervals are calculated. If the entire confidence interval lies above 1.0, the observed in-hospital mortality rate is higher than expected and performance is worse than the average performance of the reference group. If the entire confidence interval lies below 1.0, the observed in-hospital mortality rate is lower than expected and performance is better than the average performance of the reference group.

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)*:
Not pre-specified, although it is recommended that the sample size be large enough such that there is at least one death in each procedure type risk group.

2a.24 Data Source (*Check the source(s) for which the measure is specified and tested)*
Electronic clinical data, Paper medical record/flow-sheet, Electronic administrative data/claims

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.***):**
N/A

2a.26-28 Data source/data collection instrument reference web page URL or attachment:

2a.29-31 Data dictionary/code table web page URL or attachment: Attachment Item 2a.29 Data

Dictionary-634021885240930924.doc **2a.32-35 Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)* Facility/Agency **2a.36-37 Care Settings (***Check the setting(s) for which the measure is specified and tested)* Hospital **2a.38-41 Clinical Services** (*Healthcare services being measured, check all that apply*) Clinicians: Physicians (MD/DO)	
TESTING/ANALYSIS	
2b. Reliability testing **2b.1 Data/sample** *(description of data/sample and size)***:** Formal testing of reliability/repeatability has not yet been performed. **2b.2 Analytic Method** *(type of reliability & rationale, method for testing)***:** N/A **2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:** N/A	**2b** **C☐** **P☐** **M☐** **N☐**
2c. Validity testing **2c.1 Data/sample** *(description of data/sample and size)***:** Original derivation of method: (1) Kids' Inpatient Database (KID) 2000; 5117 total cases. Subsequent validation: (2) Kids' Inpatient Database (KID) 2003; 5807 total cases. **2c.2 Analytic Method** *(type of validity & rationale, method for testing)***:** Discrimination of the risk adjustment method has been quantified using the area under the receiver-operator characteristic (ROC) curve (c statistic); calibration was assessed using the Hosmer-Lemeshow test. **2c.3 Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)***:** (1) Area under the ROC curve 0.92; p value for Hosmer-Lemeshow test 0.11. (2) Area under the ROC curve 0.90; p value for Hosmer-Lemeshow test 0.09.	**2c** **C☐** **P☐** **M☐** **N☐**
2d. Exclusions Justified **2d.1 Summary of Evidence supporting exclusion(s):** Formal testing of measure exclusions has not been performed. **2d.2 Citations for Evidence:** N/A **2d.3 Data/sample** *(description of data/sample and size)***:** N/A **2d.4 Analytic Method** *(type analysis & rationale)***:** N/A **2d.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)***:** N/A	**2d** **C☐** **P☐** **M☐** **N☐** **NA☐**
2e. Risk Adjustment for Outcomes/ Resource Use Measures	**2e**

2e.1 Data/sample *(description of data/sample and size)*: N/A

2e.2 Analytic Method *(type of risk adjustment, analysis, & rationale)*:
Formal testing of the need for risk adjustment has not been performed.

2e.3 Testing Results *(risk model performance metrics)*:
N/A

2e.4 If outcome or resource use measure is not risk adjusted, provide rationale: N/A

C☐ P☐ M☐ N☐ NA☐

2f. Identification of Meaningful Differences in Performance

2f.1 Data/sample from Testing or Current Use *(description of data/sample and size)*: Kids' Inpatient Database 2003; 3228 cases performed at 83 institutions, each with >= 20 eligible surgical cases in the single calendar year.

2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance *(type of analysis & rationale)*:
A multivariable model (described in attachment Item 2a.15) can be used to generate expected mortality rates based on case mix (described in Item 2a.21) for groups of patients within a single data set. These expected rates, which are based on average performance within the data set, can be used to calculate standardized mortality ratios for each group. 95% confidence intervals for the standardized mortality ratios can also be calculated. If the confidence interval for a ratio fails to contain the value 1, this suggests that group performance is either significantly better or significantly worse than average.

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)*:
The table below shows standardized mortality ratios for a sample of 15 institutions among 83 centers contributing to the data set. The groups of patients being compared are those treated at each institution.

Hospital	Observed	Expected Mortality Rate	Mortality Rate	SMR	95% Confidence Interval
A	0.00%	3.32%	0.00	(0.00, 1.20)	
B	0.00%	1.63%	0.00	(0.00, 6.33)	
C	1.54%	2.40%	0.64	(0.01, 3.57)	
D	3.33%	3.81%	0.87	(0.01, 4.87)	
E	2.08%	2.10%	0.99	(0.01, 5.52)	
F	3.60%	3.53%	1.02	(0.27, 2.61)	
G	2.25%	1.74%	1.29	(0.15, 4.66)	
H	3.45%	2.61%	1.32	(0.15, 4.77)	
I	3.23%	2.13%	1.52	(0.02, 8.43)	
J	2.47%	1.43%	1.73	(0.19, 6.23)	
K	4.41%	2.19%	2.01	(0.40, 5.89)	
L	4.44%	2.15%	2.07	(0.56, 5.29)	
M	7.69%	3.71%	2.07	(0.42, 6.06)	
N	9.84%	3.00%	3.28	(1.20, 7.14)	
O	7.50%	2.05%	3.66	(0.74, 10.69)	

In this sample, only one institution (N) differs significantly from average performance; mortality is higher than would be expected given the center's case mix.

2f C☐ P☐ M☐ N☐

2g. Comparability of Multiple Data Sources/Methods

2g.1 Data/sample *(description of data/sample and size)*: N/A

2g C☐ P☐

2g.2 Analytic Method *(type of analysis & rationale)*: Formal evaluation of comparability of multiple data sources has not been performed. However, this measure was designed such that it could be implemented using a variety of different data sources. **2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*: N/A	**M**☐ **N**☐ **NA**☐
2h. Disparities in Care **2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: N/A **2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:** N/A	**2h** **C**☐ **P**☐ **M**☐ **N**☐ **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?** **Rationale:**	*2* **C**☐ **P**☐ **M**☐ **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 **3a.1 Current Use:** Testing not yet completed **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*): Not yet planned. **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***):** Not yet planned. **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)*: N/A **3a.5 Methods** *(e.g., focus group, survey, QI project)*: Testing of interpretability not performed. **3a.6 Results** *(qualitative and/or quantitative results and conclusions)*: N/A	**3a** **C**☐ **P**☐ **M**☐ **N**☐
3b/3c. Relation to other NQF-endorsed measures **3b.1 NQF # and Title of similar or related measures:** No similar measure.	
(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	**3b** **C**☐

population/setting/data source or different topic but same target population): **3b.2 Are the measure specifications harmonized? If not, why?** N/A	**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:** N/A **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:** N/A	**3c C☐ P☐ M☐ N☐ NA☐**
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?** **Rationale:**	**3 C☐ P☐ M☐ 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 **4a.1-2 How are the data elements that are needed to compute measure scores generated?** Data generated as byproduct of care processes during care delivery (Data are generated and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition), 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), Other Electronic medical record	**4a C☐ P☐ M☐ N☐**
4b. Electronic Sources **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*) Yes **4b.2 If not, specify the near-term path to achieve electronic capture by most providers.**	**4b C☐ P☐ M☐ N☐**
4c. Exclusions **4c.1 Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?** No **4c.2 If yes, provide justification.**	**4c C☐ P☐ M☐ N☐ NA☐**
4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences **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.** Because this measure can be applied in administrative databases, it can be subject to the coding inaccuracies sometimes associated with these databases. This problem is minimized if prospectively collected data are used.	**4d C☐ P☐ M☐ N☐**
4e. Data Collection Strategy/Implementation	**4e**

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: Not yet done. **4e.2 Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** Costs to implement has not yet been studied. **4e.3 Evidence for costs:** N/A **4e.4 Business case documentation:** N/A	**C☐ P☐ M☐ N☐**
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?** **Rationale:**	**4** **C☐ P☐ M☐ 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? **Comments:**	**Y☐ N☐ A☐**
CONTACT INFORMATION	
Co.1 Measure Steward (Intellectual Property Owner) **Co.1 Organization** Children's Hospital Boston, Program for Patient Safety and Quality, 300 Longwood Avenue, Boston, Massachusetts, 02115 **Co.2 Point of Contact** Nina, Rauscher, MS, RN, CPHQ, nina.rauscher@childrens.harvard.edu, 617-355-6567-	
Measure Developer If different from Measure Steward **Co.3 Organization** Children's Hospital Boston, Department of Surgery, 300 Longwood Avenue, Boston, Massachusetts, 02115 **Co.4 Point of Contact** Nina, Rauscher, MS, RN, CPHQ, nina.rauscher@childrens.harvard.edu, 617-355-6567-	
Co.5 Submitter If different from Measure Steward POC Nina, Rauscher, MS, RN, CPHQ, nina.rauscher@childrens.harvard.edu, 617-355-6567-, Children's Hospital Boston	
Co.6 Additional organizations that sponsored/participated in measure development	
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.**	

Ad.2 If adapted, provide name of original measure: **Ad.3-5 If adapted, provide original specifications URL or attachment**
Measure Developer/Steward Updates and Ongoing Maintenance **Ad.6 Year the measure was first released:** **Ad.7 Month and Year of most recent revision:** **Ad.8 What is your frequency for review/update of this measure?** **Ad.9 When is the next scheduled review/update for this measure?**
Ad.10 Copyright statement/disclaimers:
Ad.11 -13 Additional Information web page URL or attachment:
Date of Submission (*MM/DD/YY*)**:** 09/21/2010