

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 #: 0478	NQF Project: Perinatal and Reproductive Health Project
(for Endorsement Maintenance Review)	
Original Endorsement Date: Oct 24, 2008 Most Recent Endorsement Date: Oct 24, 2008	
BRIEF MEASURE INFORMATION	
De.1 Measure Title: Neonatal Blood Stream Infection Rate (NQI #3)	
Co.1.1 Measure Steward: Agency for Healthcare Research and Quality	
De.2 Brief Description of Measure: Percentage of high-risk newborn discharges with an ICD-9-CM diagnosis code of bloodstream infection	
2a1.1 Numerator Statement: Discharges among cases meeting the inclusion and exclusion rules for the denominator with an ICD-9-CM code for bloodstream infection in any secondary diagnosis field	
2a1.4 Denominator Statement: All newborns and outborns with 1) Birth weight 500 to 1499g OR 2) Gestational age between 24 and 30 weeks OR 3) Birth weight greater than or equal to 1500g AND - in-hospital death OR - operating room procedure OR - mechanical ventilation OR - age in days less than 2 AND transferred from another health care facility	
2a1.8 Denominator Exclusions: Exclude cases: <ul style="list-style-type: none"> • with principal diagnosis code of sepsis or secondary diagnosis code present on admission • with birth weight less than 500 grams • with length of stay less than 2 days • with missing data for (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing) See Pediatric Quality Indicators Appendices: <ul style="list-style-type: none"> • Appendix L – Low Birth Weight Categories http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/TechnicalSpecifications/PDI%20Appendices.pdf	
1.1 Measure Type: Outcome 2a1. 25-26 Data Source: Administrative 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): Not applicable	

STAFF NOTES <i>(issues or questions regarding any criteria)</i>
Comments on Conditions for Consideration:

Is the measure untested? Yes <input type="checkbox"/> No <input type="checkbox"/> 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 endorsed 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 M L I
(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): [Perinatal](#)
De.5 Cross Cutting Areas (Check all the areas that apply): [Safety : Healthcare Associated Infections](#)

1a.1 Demonstrated High Impact Aspect of Healthcare: [Affects large numbers, 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):
[In the 2008 State Inpatient Data \(SID\) there were 5,090 bloodstream infection events out of 106,899 high risk newborns, for a rate of 46.7 per 1,000. Approximatley 47% of these events are coded as NOT present on admission.](#)

[Health care-associated bacteremia is a significant problem for infants admitted into neonatal intensive care units \(NICUs\) and other hospital units. This is especially true for very low birth weight infants who are at high risk for these infections due to their immature immune systems and need for invasive monitoring and supportive care \(Adams-Chapman & Stoll, 2002; Bloom et al., 2003; Clark et al., 2004a; Clark et al., 2004b; Gaynes et al., 1996; Payne et al., 2004; Sohn et al., 2001; Stoll et al., 2002\). Reported health care-associated infection rates range from 6% to 33%, but the rate varies widely among different centers \(Adams-Chapman & Stoll, 2002; Bloom et al.,2003; Clark et al.,2004b ; Sohn et al.,2001; Stoll et al.,2002\). Mortality rates are high and infections result in increased length of stay as well as increased hospital costs and charges \(Adams-Chapman & Stoll, 2002; Bloom et al.,2003; Clark et al., 2004b; Horbar et al., 2001; Kilbride et al., 2003a; Sohn et al.,2001; Stoll et al., 2002\).](#)

[The incidence of health care-associated bacteremia increases with decreasing birth weight. Other risk factors include central venous catheter use, prolonged time using parenteral nutrition, prolonged time on mechanical ventilation, use of H2-blocking agents, and overcrowding or heavy staff loads \(Adams-Chapman & Stoll, 2002; Barton et al., 1999; Gaynes et al., 1996; Stoll et al., 2002\). The most common causative organisms are coagulase-negative staphylococci, Staphylococcus aureus, enterococci, Enterobacter sp, and Escherichia coli \(Adams-Chapman & Stoll, 2002; Clark et al., 2004b; Gaynes et al., 1996; Horbar et al., 2001; Payne et al., 2004; Sohn et al., 2001; Stoll et al., 2002\).](#)

1a.4 Citations for Evidence of High Impact cited in 1a.3: [HCUP State Inpatient Databases \(SID\). Healthcare Cost and Utilization Project \(HCUP\). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Includes approximately 6 million pediatric discharges for 2,500 hospitals.](#)

[Adams-Chapman, I. & Stoll, B.J. \(2002\). Prevention of nosocomial infections in the neonatal intensive care unit. Current Opinion in Pediatrics.14 \(2\):157-64.](#)
[Barton, L., Hodgman, J.E., & Pavlova, Z. \(1999\). Causes of death in the extremely low birth weight infant. Pediatrics. 103\(2\):446-51.](#)

Bloom, B.T., Craddock, A., Delmore, P.M., et al. (2003). Reducing acquired infections in the NICU: observing and implementing meaningful differences in process between high and low acquired infection rate centers. *Journal of Perinatology*. 23(6):489-92.

Clark, R., Powers, R., White, R., Bloom, B., Sanchez, P., & Benjamin, D.K., Jr. (2004a). Prevention and treatment of nosocomial sepsis in the NICU. *Journal of Perinatology*. 4; 24(7):446-53.

Clark, R., Powers, R., White, R., Bloom, B., Sanchez, P., & Benjamin, D.K., Jr. (2004b). Nosocomial infection in the NICU: a medical complication or unavoidable problem? *Journal of Perinatology*. 24(6):382-8.

Gaynes, R.P., Edwards, J.R., Jarvis, W.R., Culver, D.H., Tolson, J.S., & Martone, W.J. (1996). Nosocomial infections among neonates in high-risk nurseries in the United States. *National Nosocomial Infections Surveillance System. Pediatrics*. 98(3 Pt 1):357-61.

Horbar, J.D., Rogowski, J., Plsek, P.E., et al. (2001). Collaborative quality improvement for neonatal intensive care. NIC/Q Project Investigators of the Vermont Oxford Network. *Pediatrics*. 107(1):14-22.

Kilbride, H.W., Wirtschafter, D.D., Powers, R.J., & Sheehan, M.B. (2003a). Implementation of evidence-based potentially better practices to decrease nosocomial infections. *Pediatrics*. 111(4 Pt 2):e519-33.

Kilbride, H.W., Powers, R., Wirtschafter, D.D., et al. (2003b). Evaluation and development of potentially better practices to prevent neonatal nosocomial bacteremia. *Pediatrics*. 111(4 Pt 2):e504-18.

Payne, N.R., Carpenter, J.H., Badger, G.J., Horbar, J.D., & Rogowski, J. (2004). Marginal increase in cost and excess length of stay associated with nosocomial bloodstream infections in surviving very low birth weight infants. *Pediatrics*. 114(2):348-55.

Sohn, A.H., Garrett, D.O., Sinkowitz-Cochran, R.L., et al. (2001). Prevalence of nosocomial infections in neonatal intensive care unit patients: Results from the first national point-prevalence survey. *Journal of Pediatrics*. 139(6):821-7.

Stoll, B.J., Hansen, N., Fanaroff, A.A., et al. (2002). Late-onset sepsis in very low birth weight neonates: the experience of the NICHD Neonatal Research Network. *Pediatrics*. 110(2 Pt 1):285-91.

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:

This measure is intended to identify adverse events of bloodstream infection that occur in the hospitalization of interest and may be prevented through improved processes or structures of care.

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.]

Risk adjusted rate per 1,000 discharges:

1st figure: Estimate

2nd figure: Standard error

3rd figure: P-value relative to marked group (marked group = "c")

4th figure: P-value: current year relative to prior year (2008/2007)

DNC: data not collected

DSU: data do not meet criteria for statistical reliability, data quality or confidentiality

Hospital characteristic:

Location of inpatient treatment:

Northeast

c 43.494 1.623 DNC

Midwest 37.175 1.580 0.005 DNC

South 68.833 1.101 0.000 DNC

West 56.902 1.508 0.000 DNC

Ownership/control:

Private, not-for-profit c 52.669 0.824 DNC

Private, for-profit 41.200 2.579 0.000 DNC

Public 69.861 1.541 0.000 DNC

Teaching status:

Teaching 57.071 0.948 0.007 DNC
 Nonteaching c 53.302 1.035 DNC

Location of hospital (NCHS):

Large central metropolitan 60.333 0.981 0.000 DNC
 Large fringe metropolitan c 43.945 1.934 DNC
 Medium metropolitan 53.137 1.346 0.000 DNC
 Small metropolitan 56.671 2.647 0.000 DNC
 Micropolitan 34.795 5.151 0.096 DNC
 Noncore DSU DSU DSU DNC

Bed size of hospital:

Less than 100 DSU DSU DSU DNC
 100 - 299 c 50.448 1.414 DNC
 300 - 499 57.149 1.151 0.000 DNC
 500 or more 58.392 1.145 0.000 DNC

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]

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (NIS), 2008, and AHRQ Quality Indicators, modified version of 4.1.

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

Risk adjusted rate per 1,000 discharges:

1st figure: Estimate
 2nd figure: Standard error
 3rd figure: P-value relative to marked group (marked group = "c")
 4th figure: P-value: current year relative to prior year (2008/2007)
 DNC: data not collected
 DSU: data do not meet criteria for statistical reliability, data quality or confidentiality

Patient characteristic:

Gender:

Male c 55.238 0.943 DNC
 Female 55.533 1.044 0.834 DNC

Median income of patient's ZIP code:

First quartile (lowest income) 59.934 1.265 0.001 DNC
 Second quartile 53.427 1.362 0.963 DNC
 Third quartile 53.217 1.461 0.958 DNC
 Fourth quartile (highest income) c 53.330 1.558 DNC

Location of patient residence (NCHS):

Large central metropolitan 60.330 1.177 0.000 DNC
 Large fringe metropolitan c 50.881 1.507 DNC
 Medium metropolitan 52.353 1.581 0.500 DNC
 Small metropolitan 50.009 2.277 0.749 DNC
 Micropolitan 62.184 2.345 0.000 DNC
 Noncore 49.404 3.047 0.664 DNC

Expected payment source:
 Private insurance c 49.828 1.054 DNC
 Medicare DSU DSU DSU DNC
 Medicaid 60.550 0.982 0.000 DNC
 Other insurance 67.404 4.170 0.000 DNC
 Uninsured / self-pay / no charge 35.256 4.714 0.003 DNC

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]

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008, and AHRQ Quality Indicators, modified version of 4.1.

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 subcriterion1c?
M-H	M-H	M-H	Yes <input type="checkbox"/>
L	M-H	M	Yes <input type="checkbox"/> IF additional research unlikely to change conclusion that benefits to patients outweigh harms: otherwise No <input type="checkbox"/>
M-H	L	M-H	Yes <input type="checkbox"/> IF potential benefits to patients clearly outweigh potential harms: otherwise No <input type="checkbox"/>
L-M-H	L-M-H	L	No <input type="checkbox"/>

Health outcome – rationale supports relationship to at least one healthcare structure, process, intervention, or service

Does the measure pass subcriterion1c?

Yes IF rationale supports relationship

1c.1 Structure-Process-Outcome Relationship (Briefly state the measure focus, e.g., health outcome, intermediate clinical outcome, process, structure; then identify the appropriate links, e.g., structure-process-health outcome; process- health outcome; intermediate clinical outcome-health outcome):

Effective preventive measures range from simple hand-washing protocols or closed medication delivery systems to more elaborate multidisciplinary quality improvement plans involving hand-washing, nutrition, skin care, respiratory care, vascular access, and diagnostic practices. All of these interventions have been shown to substantially reduce infection rates, albeit in nonrandomized studies using historical or concurrent control units (Adams-Chapman & Stoll, 2002; Aly et al., 2005; Bloom et al., 2003; Clark et al., 2004a; Clark et al., 2004b; Horbar et al., 2001; Lam et al., 2004; Kilbride et al., 2003a; Kilbride et al., 2003b; Ng et al., 2004; Schelonka et al., 2006). For example, six Vermont Oxford Network NICUs reduced their rates of coagulase-negative staphylococcus infections from 22.0% in 1994 to 16.6% in 1996 after implementing a quality improvement model (versus a much smaller decrease from 15.4% to 14.5% at 66 comparison NICUs) (Horbar et al., 2001). A similar reduction from 24.6% to 16.4% was achieved with a multi-modality, multi-hospital intervention focusing on hand hygiene with an effective agent before and after every patient contact, eliminating hand jewelry and artificial nails, using maximal barrier precautions during central venous catheter insertion, decreasing the number of skin punctures, reducing the duration of intravenous lipid and deep line use, and improving the diagnosis of health care-associated infections. (Kilbride et al., 2003a; Kilbride et al., 2003b).

Given the fragility and susceptibility of the patient population, a baseline level of health care-associated infections will be expected, even with good protocols in place. However, those centers that have prevention protocols, and are able to encourage health care workers to adhere to these protocols, will probably have success in reducing their rates of health care-associated bacteremia in their neonatal population. Indeed, several quasi-experimental studies have demonstrated that NICUs can lower their infection rates (based on positive blood cultures) from as high as 13.5 per 1,000 patient days to as low as 3.0 per 1,000 patient days (Adams-Chapman & Stoll, 2002; Aly et al., 2005; Bloom et al., 2003; Clark et al., 2004a; Clark et al., 2004b; Horbar et al., 2001; Lam et al., 2004; Kilbride et al., 2003a; Kilbride et al., 2003b; Ng et al., 2004; Schelonka et al., 2006).

1c.2-3 Type of Evidence (Check all that apply):

Selected individual studies (rather than entire body of evidence)

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*):

Not applicable

1c.5 **Quantity of Studies in the Body of Evidence** (*Total number of studies, not articles*): Not applicable

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*): Not applicable

1c.7 **Consistency of Results across Studies** (*Summarize the consistency of the magnitude and direction of the effect*): Not applicable

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

Not applicable

1c.9 **Grading of Strength/Quality of the Body of Evidence.** Has the body of evidence been graded? No

1c.10 **If body of evidence graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias:** Not applicable

1c.11 **System Used for Grading the Body of Evidence:** Other

1c.12 **If other, identify and describe the grading scale with definitions:** Not applicable

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

1c.14 **Summary of Controversy/Contradictory Evidence:** Not applicable

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

Adams-Chapman, I. & Stoll, B.J. (2002). Prevention of nosocomial infections in the neonatal intensive care unit. *Current Opinion in Pediatrics*. 14 (2):157-64.

Aly, H., Herson, V., Duncan, A., et al. (2005). Is bloodstream infection preventable among premature infants? A tale of two cities. *Pediatrics*. 115(6):1513-8.

Bloom, B.T., Craddock, A., Delmore, P.M., et al. (2003). Reducing acquired infections in the NICU: observing and implementing meaningful differences in process between high and low acquired infection rate centers. *Journal of Perinatology*. 23(6):489-92.

Clark, R., Powers, R., White, R., Bloom, B., Sanchez, P., & Benjamin, D.K., Jr. (2004a). Prevention and treatment of nosocomial sepsis in the NICU. *Journal of Perinatology*. 4; 24(7):446-53.

Clark, R., Powers, R., White, R., Bloom, B., Sanchez, P., & Benjamin, D.K., Jr. (2004b). Nosocomial infection in the NICU: a medical complication or unavoidable problem? *Journal of Perinatology*. 24(6):382-8.

Horbar, J.D., Rogowski, J., Plsek, P.E., et al. (2001). Collaborative quality improvement for neonatal intensive care. NIC/Q Project Investigators of the Vermont Oxford Network. *Pediatrics*. 107(1):14-22.

Kilbride, H.W., Wirtschafter, D.D., Powers, R.J., & Sheehan, M.B. (2003a). Implementation of evidence-based potentially better practices to decrease nosocomial infections. *Pediatrics*. 111(4 Pt 2):e519-33.

Kilbride, H.W., Powers, R., Wirtschafter, D.D., et al. (2003b). Evaluation and development of potentially better practices to prevent neonatal nosocomial bacteremia. *Pediatrics*. 111(4 Pt 2):e504-18.

Lam, B.C., Lee, J., & Lau, Y.L. (2004). Hand Hygiene Practices in a Neonatal Intensive Care Unit: A Multimodal Intervention and Impact on Nosocomial Infection. *Pediatrics*. 114 (5):e565.

Ng, P.C., Wong, H.L., Lyon, D.J., et al. (2004). Combined use of alcohol hand rub and gloves reduces the incidence of late onset infection in very low birthweight infants. *Archives of Disease in Childhood Fetal &*

Neonatal Edition. 89(4):F336-40.

Schelonka, R.L., Scruggs, S., Nichols, K., Dimmitt, R.A., & Carlo, W.A. (2006). Sustained reductions in neonatal nosocomial infection rates following a comprehensive infection control intervention. *Journal of Perinatology*. 26(3):176-9.

1c.16 Quote verbatim, the specific guideline recommendation (Including guideline # and/or page #):
Not applicable

1c.17 Clinical Practice Guideline Citation: Not applicable

1c.18 National Guideline Clearinghouse or other URL: Not applicable

1c.19 Grading of Strength of Guideline Recommendation. Has the recommendation been graded? No

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: Other

1c.22 If other, identify and describe the grading scale with definitions: Not applicable

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: Moderate 1c.26 Quality: Moderate 1c.27 Consistency: Moderate

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://qualityindicators.ahrq.gov/modules/pdi_resources.aspx

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 among cases meeting the inclusion and exclusion rules for the denominator with an ICD-9-CM code for bloodstream infection in any secondary diagnosis field

2a1.2 Numerator Time Window *(The time period in which the target process, condition, event, or outcome is eligible for inclusion):*
Users may select the time window, but generally one calendar year

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:*
Note: the specification reflects the harmonized measure with The Joint Commission, rather than the technical specification as currently posted.

Any secondary diagnosis ICD-9-CM code for:

03810
STAPHYLOCOCC SEPTICEM NOS
03811
METH SUSC STAPH AUR SEPT
03812
MRSA SEPTICEMIA
03819
STAPHYLOCOCC SEPTICEM NEC
03840
GRAM-NEG SEPTICEMIA NOS
03842
E COLI SEPTICEMIA
03843
PSEUDOMONAS SEPTICEMIA
03844
SERRATIA SEPTICEMIA
03849
GRAM-NEG SEPTICEMIA NEC
1125
DISSEMINATED CANDIDIASIS

OR

Any secondary diagnosis ICD-9-CM code for:

77181
NB SEPTICEMIA [SEPSIS]
77183
BACTEREMIA OF NEWBORN

AND

Any secondary diagnosis ICD-9-CM code for:

04104
ENTEROCOCCUS GROUP D
04110
STAPHYLOCOCCUS UNSPCFIED
04111
MTH SUS STPH AUR ELS/NOS
04119
OTHER STAPHYLOCOCCUS
0413
KLEBSIELLA INFECT N
0414
E. COLI INFECT NOS

04141
 SHIGA TXN-PRODUCE E.COLI
 04142
 SHGA TXN PROD E.COLI NEC
 04143
 SHGA TXN PROD E.COLI NOS
 04149
 E.COLI INFECTION NEC/NOS
 0417
 PSEUDOMONAS INFECT NOS
 04185
 OTH GRAM NEGATV BACTERIA

2a1.4 Denominator Statement (Brief, narrative description of the target population being measured):

All newborns and outborns with
 1) Birth weight 500 to 1499g OR
 2) Gestational age between 24 and 30 weeks OR
 3) Birth weight greater than or equal to 1500g AND
 - in-hospital death OR
 - operating room procedure OR
 - mechanical ventilation OR
 - age in days less than 2 AND transferred from another health care facility

2a1.5 Target Population Category (Check all the populations for which the measure is specified and tested if any): [Children's Health](#)

2a1.6 Denominator Time Window (The time period in which cases are eligible for inclusion):

Users may select the time window, but generally one calendar year

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):

Note: the specification reflects the harmonized measure with The Joint Commission, rather than the technical specification as currently posted.

In-hospital death (DISP=20)

ICD-9-CM Diagnosis Codes for gestation age between 24 and 30 weeks:

76522
 24 COMPLETED WEEKS OF GESTATION
 76523
 25-26 COMPLETED WEEKS OF GESTATION
 76524
 27-28 COMPLETED WEEKS OF GESTATION
 76525
 29-30 COMPLETED WEEKS OF GESTATION

ICD-9-CM Procedure Codes for Mechanical Ventilation:

9670
 CONTINUOUS MECHANICAL VENTILATION OF UNSPEC DURATION
 9671
 CONTINUOUS MECHANICAL VENTILATION FOR LESS THAN 96 CONSECUTIVE HRS
 9672
 CONTINUOUS MECHANICAL VENTILATION FOR 96 CONSECUTIVE HOURS OR MORE

See Pediatric Quality Indicators Appendices:

- Appendix A – Operating Room Procedure Codes

NOTE: THE FOLLOWING CODES SHOULD BE REMOVED FROM APPENDIX A:

- ‘0058’ INS INTRA-ANSM PRES MNTR (begin 2008)
- ‘0059’ INTRAVASC MSMNT COR ART (begin 2008)
- ‘0067’ INTRAVAS MSMNT THORC ART (begin 2008)
- ‘0068’ INTRAVAS MSMT PERIPH ART (begin 2008)
- ‘0069’ INTRAVS MSMT VES NEC/NOS (begin 2008)

- Appendix I – Definitions of Neonate, Newborn, Normal Newborn, and Outborn
- Appendix J – Admission Codes for Transfers
- Appendix L – Low Birth Weight Categories

<http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/TechnicalSpecifications/PDI%20Appendices.pdf>

2a1.8 Denominator Exclusions (*Brief narrative description of exclusions from the target population*):

Exclude cases:

- with principal diagnosis code of sepsis or secondary diagnosis code present on admission
- with birth weight less than 500 grams
- with length of stay less than 2 days
- with missing data for (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

See Pediatric Quality Indicators Appendices:

- Appendix L – Low Birth Weight Categories

<http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/TechnicalSpecifications/PDI%20Appendices.pdf>

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*):

Note: the specification reflects the harmonized measure with the Joint Commission, rather than the technical specification as currently posted.

ICD-9-CM Diagnosis Codes for Sepsis:

0380

STREPTOCOCCAL SEPTICEMIA

0381

STAPHYLOCOCCAL SEPTICEMIA

03810

STAPHYLOCOCCAL SEPTICEMIA, UNSPECIFIED

03811

METHICILLIN SUSCEPTIBLE STAPHYLOCOCCUS AUREUS SEPTICEMIA (OCT08)

03812

METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS SEPTICEMIA (OCT08)

03819

OTHER STAPHYLOCOCCAL SEPTICEMIA

0382

PNEUMOCOCCAL SEPTICEMIA (STREPTOCOCCUS PNEUMONIAE SEPTICEMIA)

0383

SEPTICEMIA DUE TO ANAEROBES

03840

GRAM-NEGATIVE ORGANISM, UNSPECIFIED

03841

HEMOPHILUS INFLUENZAE

03842

ESCHERICHIA COLI

03843

PSEUDOMONAS
 03844
 SERRATIA
 03849
 SEPTICEMIA DUE TO OTHER GRAM-NEGATIVE ORGANISMS
 0388
 OTHER SPECIFIED SEPTICEMIAS
 0389
 UNSPECIFIED SEPTICEMIA
 1125
 DISSEMINATED CANDIDIASIS
 77181
 NB SEPTICEMIA [SEPSIS]
 77183
 BACTEREMIA OF NEWBORN
 78552
 SEPTIC SHOCK
 78559*
 SHOCK WITHOUT MENTION OF TRAUMA, OTHER
 7907
 BACTEREMIA
 99591
 SYSTEMIC INFLAMMATORY RESPONSE SYNDROME DUE TO INFECTIOUS PROCESS W/O ORGAN DYSFUNCTION
 99592
 SYSTEMIC INFLAMMATORY RESPONSE SYNDROME DUE TO INFECTIOUS PROCESS W/ ORGAN DYSFUNCTION
 9980
 POSTOPERATIVE SHOCK
 99800
 POSTOPERATIVE SHOCK, NOS
 99802
 POSTOP SHOCK, SEPTIC
 *Not valid for discharges effective October 1, 2004

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): Statistical risk model **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.):

The predicted value for each case is computed using a hierarchical model (logistic regression with hospital random effect) and covariates for gender, birthweight (500g groups), modified CMS DRG, congenital anomalies, transfer-in status and the availability of point of origin. The specific covariates retained in the model for this measure are listed below. The reference population used in the regression is the universe of discharges for states that participate in the HCUP State Inpatient Data (SID) for the years 2008, a database consisting of 43 states and approximately 6 million pediatric discharges. The expected rate is computed as the sum of the predicted value for each case divided by the number of cases for the unit of analysis of interest (i.e., hospital). The risk adjusted rate is computed using indirect standardization as the observed rate divided by the expected rate, multiplied by the reference population rate.

Specific covariates used for this measure:

Birth Weight 1000 to 2499
 Birth Weight 750 to 999

NQF #0478 Neonatal Blood Stream Infection Rate (NQI #3)

Birth Weight <500 to 749
 Modified DRG 1501 Neonates, died or transferred to another acute care facility
 Congenital anomalies category 1 Gastrointestinal
 Congenital anomalies category 5 Cardiovascular
 Congenital anomalies category 8 Other
 TRANSFER Transfer-in
 NOPOUB04 UB-04 Point-of-Origin Data Not Available

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:

URL
<http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/Risk%20Adjustment%20Tables%20PDI%204.3.pdf>
 Not applicable

2a1.17-18. Type of Score: [Rate/proportion](#)

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 = Lower 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 measure is expressed as a rate, defined as (outcome of interest / population at risk) or (numerator / denominator). The AHRQ Quality Indicators (AHRQ QI) software performs six steps to produce the rate 1) Discharge-level data is used to identify inpatient records containing the outcome of interest and 2) the population at risk. 3) Calculate observed rates. Using output from steps 1 and 2, observed rates are calculated for user-specified combinations of stratifiers. 4) Calculate expected rates. Use the risk-adjustment model to calculate the rate one would expect at the hospital based on the hospital's case-mix and the average performance for that case-mix in the reference population. 5) Calculate risk-adjusted rate. Use the indirect standardization to account for case-mix. For indicators that are not risk-adjusted, the risk-adjusted rate is the same as the observed rate. 6) Calculate smoothed rate. A Univariate shrinkage factor is applied to the risk-adjusted rates. The shrinkage estimator reflects a reliability adjustment unique to each indicator and provider. The estimator is the signal-to-noise ratio, where signal is the between provider variance and noise is the within provider variance.

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

URL
<http://qualityindicators.ahrq.gov/Downloads/Resources/Publications/2011/QI%20Empirical%20Methods%2005-03-11.pdf>
 Not applicable

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:

[Administrative 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.): [HCUP State Inpatient Databases \(SID\). Healthcare Cost and Utilization Project \(HCUP\). 2008. Agency for Healthcare Research and Quality, Rockville, MD.](#)

2a1.27-29 Data Source/data Collection Instrument Reference Web Page URL or Attachment: [URL](#)

<http://hcup-us.ahrq.gov/sidoverview.jsp>

Not applicable

2a1.30-32 Data Dictionary/Code Table Web Page URL or Attachment:

URL

<http://qualityindicators.ahrq.gov/Downloads/Software/WinQI/V43/AHRQ%20QI%20Software%20Instructions,%20WinQI.pdf>

Not applicable

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): Hospital/Acute Care Facility

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):

HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Includes approximately 6 million pediatric discharges for 2,500 hospitals.

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

The signal to noise ratio is the ratio of the between hospital variance (signal) to the within hospital variance (noise). The formula is $\text{signal} / (\text{signal} + \text{noise})$. The ratio itself is only a diagnostic for the degree of variance in the risk-adjusted rate systematically associated with the provider. Therefore, what matters is the magnitude of the variance in the "smoothed" rate (that is, the variance in the risk-adjusted rate after the application of the univariate shrinkage estimator based on the signal ratio).

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

Updated Testing Results including both benign and malignant cases:

What the data demonstrate is systematic variation in the provider level rate of 0.419 to 69.167 per 1,000 from the 5th to 95th percentile after a signal ratio of 0.831 is applied as the shrinkage estimator (that is, after accounting for variation due to random factors).

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:

No differences identified

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):

HCUP Kids' Inpatient Database (KID). Healthcare Cost and Utilization Project (HCUP). 2000 and 2003. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/kidoverview.jsp

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

A structured panel review of each indicator was undertaken to evaluate the face validity (from a clinical perspective) of the indicator. Specifically, the panels approach sought to establish consensual validity, which "extends face validity from one expert to a panel of experts who examine and rate the appropriateness of each item...." The methodology for the structured review was adapted from the RAND/UCLA Appropriateness Method and consisted of an initial independent assessment of each indicator by clinician panelists using an initial questionnaire, a conference call among all panelists, followed by a final independent assessment by clinician panelists using the same questionnaire. The panel process served to refine definitions of some indicators, add new measures, and dismiss indicators with major concerns from further consideration.

Measures Of Pediatric Health Care Quality Based On Hospital Administrative Data

The Pediatric Quality Indicators Neonatal Indicator Appendix (2008)

http://qualityindicators.ahrq.gov/Downloads/Modules_Non_Software/Modules%20Development%20Bullet/pdi_development.zip

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*):

The multi-specialty Panel rated the indicator as acceptable on overall usefulness as an indicator of potentially preventable complications of care.

Question / Median / Agreement status

Overall rating – internal QI area / 8 / Agree

Overall rating – comparative purposes / 8 / Agree

Importance / 8.5 / Agree

Preventability / 7 / Indeterminate

Likelihood of Medical Error / 6.5 / Indeterminate

Charting / 8 / Agree

Bias / 5 / Indeterminate

Final recommendation

Internal QI: Recommended

Comparative purposes: Recommended

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*):

HCUP Kids' Inpatient Database (KID). Healthcare Cost and Utilization Project (HCUP). 2000 and 2003. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/kidoverview.jsp

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

Clinical panel review (see above for a description of the methodology)

Exclusions were intended to identify cases where the outcome of interest was more likely to be present on admission.

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

Changes Implemented as a Result of Pediatric Panel Review

Admissions from home or late transfers excluded. Patients admitted from home may have acquired the infection at home. Likewise, patients transferred on or after day two of age, may have acquired the infection at the transferring facility.

NOTE: In the current specification this is implemented as an inclusion criteria

- age in days less than 2 AND transferred from another health care facility

Exclude patients with a length of stay of less than 2 days - It is unlikely that these patients would acquire a nosocomial pathogen in such a short timespan.

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*):

HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Includes approximately 6 million pediatric discharges for 2,500 hospitals.

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

Risk-adjustment models use a standard set of categories based on readily available classification systems for demographics,

severity of illness and comorbidities. Within each category, covariates are initially selected based on a minimum of 30 cases in the outcome of interest. Then a stepwise regression process on a development sample is used to select a parsimonious set of covariates where $p < .05$. Model is then tested on a validation sample.

If the user's data lacks present on admission information, then the likelihood that the outcome of interest and the covariates are present on admission is estimated using a Markov Chain Monte Carlo (MCMC) estimation procedure. That likelihood is then used to adjust the observed and expected rates.

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*):

c-statistic for the outcome of interest (y|x): 0.614

c-statistic for present on admission (p|x): 0.718 (when POA data are missing)

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*):

HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Includes approximately 6 million pediatric discharges for 2,500 hospitals.

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

Posterior probability distribution parameterized using the Gamma distribution

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

Raw Rates (numerator / denominator):

5th 25th Median 75th 95th

0.000419 0.004075 0.012324 0.028426 0.069167

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*): Rates are risk-adjusted rate per 1,000

"c": Reference for p-value test statistics

1st figure: estimate
 2nd figure: standard error
 3rd figure: p value relative to marked group (marked group = "c")
 4th figure: p value: current year relative to prior year (2008/2007)
 DNC: data not collected
 DSU: data do not meet criteria for statistical reliability, data quality or confidentiality

Patient characteristic:

Gender:

Male c 55.238 0.943 DNC
 Female 55.533 1.044 0.834 DNC

Median income of patient's ZIP code:

First quartile (lowest income) 59.934 1.265 0.001 DNC
 Second quartile 53.427 1.362 0.963 DNC
 Third quartile 53.217 1.461 0.958 DNC
 Fourth quartile (highest income) c 53.330 1.558 DNC

Location of patient residence (NCHS):

Large central metropolitan 60.330 1.177 0.000 DNC
 Large fringe metropolitan c 50.881 1.507 DNC
 Medium metropolitan 52.353 1.581 0.500 DNC
 Small metropolitan 50.009 2.277 0.749 DNC
 Micropolitan 62.184 2.345 0.000 DNC
 Noncore 49.404 3.047 0.664 DNC

Expected payment source:

Private insurance c 49.828 1.054 DNC
 Medicare DSU DSU DSU DNC
 Medicaid 60.550 0.982 0.000 DNC
 Other insurance 67.404 4.170 0.000 DNC
 Uninsured / self-pay / no charge 35.256 4.714 0.003 DNC

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 Purpose/ Use (Check all the purposes and/or 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): **Public Reporting, Quality Improvement (Internal to the specific organization)**

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.]**

The measure (with some adaptations) is included in the Specifications Manual for The Joint Commission National Quality Core Measures.

In addition, the measure is included in the three year release plan of the MONAHRQ tool, which is a desktop software tool that enables organizations - such as state and local data organizations, regional reporting collaboratives, hospitals and hospital systems, and health plans - to quickly and easily generate a health care reporting Website. MONAHRQ analyzes, summarizes, and presents information in a format ready for use by consumers and other decision makers. At the time the measure is added to MONAHRQ the public will be informed of the enhancement through various presentations and through the MONAHRQ listserv. <http://monahrq.ahrq.gov/>

Finally, AHRQ observed in the Measure Application Partnership (MAP) forum that the preponderance of measurement and reporting is on adults and the elderly. Public reporting sites have a tendency to not adopt pediatric and neonatal measures. For example, in comparing NQF endorsed AHRQ QI adult measures where there is a corresponding pediatric measure (e.g. PSI 5 & PDI 3: foreign body left during procedure for adults & peds respectively) we see the adult version of the measure appears in public reports nearly four times as often as the pediatric measure. AHRQ supported the discussion in its committee participation within the MAP in favor of measurement of all ages where possible, which includes pediatrics and neonates.

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: The MONAHRQ reporting format is based on research conducted by team from the School of Public Affairs, Baruch College, under contracts with the Department of Public Health, Weill Medical College and Battelle, Inc., has developed a pair of Hospital Quality Model Reports at the request of the Agency for Healthcare Research & Quality (AHRQ). These reports are designed specifically to report comparative information on hospital performance based on the AHRQ Quality Indicators (QIs). The work was done in close collaboration with AHRQ staff and the AHRQ Quality Indicators team.

The Model Reports (discussed immediately above) are based on:

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

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): **Not applicable**

3b. **Usefulness for Quality Improvement:** H M L I

(The measure is meaningful, understandable and useful for quality improvement.)

NQF #0478 Neonatal Blood Stream Infection Rate (NQI #3)

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].

The Neonatal Blood Stream Infection Rate (NQI 3) is one of three neonatal measures within the Pediatric Quality Indicators (PDIs) module. The PDIs are a set of indicators providing information on potential in-hospital complications and adverse events following surgery. The PDIs were developed after a comprehensive literature review, analysis of ICD-9-CM codes, review by a clinician panel, implementation of risk adjustment, and empirical analyses.

The PDIs can be used to help hospitals identify potential adverse events that might need further study; provide the opportunity to assess the incidence of adverse events and in hospital complications using administrative data found in the typical discharge record; include indicators for complications occurring in hospital that may represent patient safety events.

The following entity uses the NQI 3 measure in quality improvement:

1) University Healthsystem Consortium (UHC)

UHC is an alliance of 103 academic medical centers and 219 of their affiliated hospitals. UHC reports this and other AHRQ QIs to their member hospitals for their internal quality improvement purposes.

2) National Perinatal Information Center/Quality Analytic Services (NPIC/QAS)

NPIC/QAS member hospitals (70 hospitals, 305,850 inborns in CY 2010) receive their NQI 3 rate quarterly. Their rate is compared to the average for their subgroup of hospitals and to the NPIC/QAS data base average. Clinical staff at each facility review their rate and validate their data using lists of numerator cases against medical record documentation. Generally few discrepancies are found; when discrepancies are identified, clinicians use the information to determine if the source is provider documentation, inappropriate coding or a problem with quality of care.

Within each quarterly report, NPIC/QAS member hospitals are given a graph of their rate compared to their subgroup average and database average. This external benchmarking helps hospitals identify whether they are significantly above or below their subgroup and database averages. Each hospital is also provided the 2008 AHRQ NQI 3 provider rate. Where there are significant differences, hospitals will generally initiate a QI activity and monitor change in their rates over time.

http://www.npic.org/services/V102_SAMPLE_Expanded_Set_of_Perinatal_Indicators.pdf

http://www.npic.org/Services/V102_SAMPLE_Appendices_for_Expanded_Set_of_Perinatal_Indicators.pdf

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:

Users can readily use the observed, expected and risk-adjusted rate results to identify opportunities for improvement for specific patient populations based on default stratifiers or risk adjustment model covariates. In addition, comparative data from the AHRQ SID and KID databases provides relative performance information.

The AHRQ QI support line receives approximately 150 user queries per month and almost 50 user per month download the AHRQ QI PDI software. Users have used the PDI since the release in 2006, and the NQI since initial release in 2009.

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)

4b. Electronic Sources: H <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> I <input type="checkbox"/>
4b.1 Are the data elements needed for the measure as specified available electronically (<i>Elements that are needed to compute measure scores are in defined, computer-readable fields</i>): ALL data elements in electronic claims
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 <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> I <input type="checkbox"/>
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: Coding professionals follow detail guidelines, are subject to training and credentialing requirements, peer review and audit.
4d. Data Collection Strategy/Implementation: H <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> I <input type="checkbox"/>
A.2 Please check if either of the following apply (<i>regarding proprietary measures</i>): 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 (<i>e.g., fees for use of proprietary measures</i>): The AHRQ QI software has been publicly available at no cost since 2001; Users have over ten years of experience using the AHRQ QI software in SAS and Windows.
Overall, to what extent was the criterion, <i>Feasibility</i> , met? H <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> I <input type="checkbox"/> Provide rationale based on specific subcriteria:

OVERALL SUITABILITY FOR ENDORSEMENT
Does the measure meet all the NQF criteria for endorsement? Yes <input type="checkbox"/> No <input type="checkbox"/> 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 (<i>either same measure focus or target population</i>) or competing measures (<i>both the same measure focus and same target population</i>), list the NQF # and title of all related and/or competing measures:
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 (<i>e.g., a more valid or efficient way to measure quality</i>); OR provide a rationale for the additive value of endorsing an additional measure. (<i>Provide analyses when possible</i>):

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CONTACT INFORMATION

<p>Co.1 Measure Steward (Intellectual Property Owner): Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850</p>
<p>Co.2 Point of Contact: John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-</p>
<p>Co.3 Measure Developer if different from Measure Steward: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850</p>
<p>Co.4 Point of Contact: John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-</p>
<p>Co.5 Submitter: John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality</p>
<p>Co.6 Additional organizations that sponsored/participated in measure development: Battelle Memorial Institute, University of California-Davis, Stanford University</p>
<p>Co.7 Public Contact: John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality</p>

ADDITIONAL INFORMATION

<p>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</p>
<p>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</p>
<p>Measure Developer/Steward Updates and Ongoing Maintenance Ad.3 Year the measure was first released: 2009 Ad.4 Month and Year of most recent revision: 08, 2011 Ad.5 What is your frequency for review/update of this measure? Annual Ad.6 When is the next scheduled review/update for this measure? 12, 2011</p>
<p>Ad.7 Copyright statement: None</p>
<p>Ad.8 Disclaimers: None</p>
<p>Ad.9 Additional Information/Comments: None</p>
<p>Date of Submission (MM/DD/YY): 10/19/2011</p>