

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 #: 0303	NQF Project: Perinatal and Reproductive Health Project
(for Endorsement Maintenance Review)	
Original Endorsement Date: Nov 15, 2007 Most Recent Endorsement Date: Nov 15, 2007 Last Updated Date: May 08, 2012	
BRIEF MEASURE INFORMATION	
De.1 Measure Title: Late sepsis or meningitis in neonates (risk-adjusted)	
Co.1.1 Measure Steward: Vermont Oxford Network	
De.2 Brief Description of Measure: Standardized rate and standardized morbidity ratio for nosocomial bacterial infection after day 3 of life for very low birth weight infants, other infants who are admitted to a neonatal intensive care unit within 28 days of birth and other infants who die in a hospital within 28 days of birth.	
2a1.1 Numerator Statement: Eligible infants with one or more of the following criteria: Criterion 1: Bacterial Pathogen. A bacterial pathogen is recovered from a blood and/or cerebral spinal fluid culture obtained after Day 3 of life. OR Criterion 2: Coagulase Negative Staphylococcus. The infant has all 3 of the following: 1. Coagulase negative staphylococcus is recovered from a blood culture obtained from either a central line, or peripheral blood sample and/or is recovered from cerebrospinal fluid obtained by lumbar puncture, ventricular tap or ventricular drain. 2. One or more signs of generalized infection (such as apnea, temperature instability, feeding intolerance, worsening respiratory distress or hemodynamic instability). 3. Treatment with 5 or more days of intravenous antibiotics after the above cultures were obtained. If the infant died, was discharged, or transferred prior to the completion of 5 days of intravenous antibiotics, this condition would still be met if the intention were to treat for 5 or more days.	
2a1.4 Denominator Statement: Eligible infants who are in the reporting hospital after day 3 of life.	
2a1.8 Denominator Exclusions: Exclude patients who do not meet eligibility criteria for birth weight, gestational age or NICU admission. Exclude infants who are discharged home, transferred or die prior to day 3 of life.	
1.1 Measure Type: Outcome 2a1.25-26 Data Source: Registry Data 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):

N/A

STAFF NOTES (issues or questions regarding any criteria)

Comments on Conditions for Consideration:

Is the measure untested? Yes ☐ No ☒ 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 Non-Condition Specific (Check all the areas that apply): [Safety : Healthcare Associated Infections](#)

1a.1 Demonstrated High Impact Aspect of Healthcare: [Affects large numbers, A leading cause of morbidity/mortality, Patient/societal consequences of poor quality, Severity of illness](#)

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

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

[Infants admitted to neonatal intensive care units are at high risk of hospital acquired infections. Hospital acquired infection in this population is associated with increased mortality, morbidity, length of stay and cost.](#)

1a.4 Citations for Evidence of High Impact cited in 1a.3: [Reese Clark MD^{1,2}, Richard Powers MD, Robert White MD, Barry Bloom MD, Pablo Sanchez MD and Daniel K Benjamin Jr MD, MPH, PhD. Nosocomial Infection in the NICU: A Medical Complication or Unavoidable Problem? Journal of Perinatology \(2004\) 24, 382–388.](#)

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: [A bundle of improvement practices has been shown to dramatically reduce the frequency of hospital acquired infection.](#)

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.]

In 2009 at 293 hospitals in the Vermont Oxford Network expanded database for all NICU admission, of the 123,000 infants of all birth weights enrolled 4% had a hospital acquired bacterial infection. There was marked variation in rates among hospitals with the following distribution by percentiles:

10TH 25th 50th 75th 90th

0.4 1.4 2.9 5.2 8.5

Showing a 20 fld variation from the 10th to the 90th percentiles.

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]

In 2009 at 293 hospitals in the Vermont Oxford Network expanded database for all NICU admission, of the 123,000 infants of all birth weights enrolled 4% had a hospital acquired bacterial infection. There was marked variation in rates among hospitals with the following distribution by percentiles:

10TH 25th 50th 75th 90th

0.4 1.4 2.9 5.2 8.5

Showing a 20 fld variation from the 10th to the 90th percentiles.

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

The rates vary by birth weight category ranging from 28% for infants <1000 grams to 1% for infants over 2500 grams. (Vermont Oxford Network 2009)

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]

Vermont Oxford Network. 2009 Expanded Database Summary. Vermont Oxford Network. Burlington, VT. 2010.

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

Health outcome – rationale supports relationship

Does the measure pass subcriterion1c?

to at least one healthcare structure, process, intervention, or service	Yes IF rationale supports relationship
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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):
 Health outcome: hospital acquired bacterial infection
 Process: specific practices related to hand hygiene, line insertion, care and removal
 Structure: a key factor is the unit culture
 Links: Unit culture impacts adherence to infection prevention practices which influence rate of infection.

1c.2-3 Type of Evidence (Check all that apply):
 Clinical Practice Guideline, Other, Selected individual studies (rather than entire body of evidence)
 other

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):
 There is strong evidence that hospital acquired infections in the NICU can be reduced by appropriate practices and by quality improvement interventions.

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

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): The available studies from NICUs are observational or before after.

1c.7 Consistency of Results across Studies (Summarize the consistency of the magnitude and direction of the effect): Consistent in magnitude and direction across NICU studies and when compared to similar studies in adult and pediatric intensive care.

1c.8 Net Benefit (Provide estimates of effect for benefit/outcome; identify harms addressed and estimates of effect; and net benefit - benefit over harms):
 Marked reductions in hospital acquired bacterial infections in the NICU can be achieved leading to better outcomes, shorter hospital stay and lower costs.

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: N/A

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

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

1c.13 Grade Assigned to the Body of Evidence: N/A

1c.14 Summary of Controversy/Contradictory Evidence: Given that the evidence is predominantly from before after or observational time series studies, there is the possibility that the magnitude of effect of quality improvement interventions on hospital acquired infection could be confounded by the non-randomized nature of the studies.

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

Joseph Schulman, Rachel Stricof, Timothy P. Stevens, Michael Horgan, Kathleen Gase, Ian R. Holzman, Robert I. Koppel, Suhas Nafday, Kathleen Gibbs, Robert Angert, Aryeh Simmonds, Susan A. Furdon, Lisa Saiman, and the New York State Regional Perinatal Care Centers
Statewide NICU Central-Line-Associated Bloodstream Infection Rates Decline After Bundles and Checklists . Pediatrics 2011; 127:3 436-444;

David D. Wirtschafter, Richard J. Powers, Janet S. Pettit, Henry C. Lee, W. John Boscardin, Mohammad Ahmad Subeh, and Jeffrey B. Gould. Nosocomial Infection Reduction in VLBW Infants With a Statewide Quality-Improvement Model . Pediatrics 2011; 127:3 419-426

Ohio Statewide Quality-Improvement Collaborative to Reduce Late-Onset Sepsis in Preterm Infants
Heather C. Kaplan, Carole Lannon, Michele C. Walsh, Edward F. Donovan, and for the Ohio Perinatal Quality Collaborative. Pediatrics 2011; 127:3 427-435

1c.16 Quote verbatim, the specific guideline recommendation (Including guideline # and/or page #):

See PDF below for extensive guideline recommendations
<http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf>

1c.17 Clinical Practice Guideline Citation: Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

<http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf>

1c.18 National Guideline Clearinghouse or other URL: N/A

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

1c.20 If guideline recommendation graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias: As in previous guidelines issued by CDC and HICPAC, each recommendation is categorized on the basis of existing scientific data, theoretical rationale, applicability and economic impact.

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

1c.22 If other, identify and describe the grading scale with definitions: As in previous guidelines issued by CDC and

- > HICPAC, each recommendation is categorized on the basis of existing
- > scientific data, theoretical rationale, applicability, and economic
- > impact.
- > <http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf>

1c.23 Grade Assigned to the Recommendation: See above for CDC grading of evidence for each component of the recommendations

1c.24 Rationale for Using this Guideline Over Others: CDC is authoritative source

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: High **1c.26 Quality:** High **1c.27 Consistency:** High

1c.28 Attach evidence submission form:

1c.29 Attach appendix for supplemental materials:

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

See Guidance for Definitions of Rating Scale: H=High; M=Moderate; L=Low; I=Insufficient; NA=Not Applicable
Created on: 05/23/2021 at 02:15 PM

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

Provide rationale based on specific subcriteria:

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

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

2. RELIABILITY & VALIDITY - SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. **(evaluation criteria)**

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

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

S.2 If yes, provide web page URL: <http://www.vtoxford.org/about/NQF%20Measure%200303.pdf>

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

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

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

Eligible infants with one or more of the following criteria:

Criterion 1: Bacterial Pathogen. A bacterial pathogen is recovered from a blood and/or cerebral spinal fluid culture obtained after Day 3 of life.

OR

Criterion 2: Coagulase Negative Staphylococcus. The infant has all 3 of the following:

1. Coagulase negative staphylococcus is recovered from a blood culture obtained from either a central line, or peripheral blood sample and/or is recovered from cerebrospinal fluid obtained by lumbar puncture, ventricular tap or ventricular drain.
2. One or more signs of generalized infection (such as apnea, temperature instability, feeding intolerance, worsening respiratory distress or hemodynamic instability).
3. Treatment with 5 or more days of intravenous antibiotics after the above cultures were obtained. If the infant died, was discharged, or transferred prior to the completion of 5 days of intravenous antibiotics, this condition would still be met if the intention were to treat for 5 or more days.

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

After day 3 of life and until death or discharge home or transfer from the reporting hospital. Infants readmitted to the reporting hospital following transfer to another hospital are monitored following readmission.

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:*

Infants in the reporting hospital after day 3 of life or readmitted after day three of life are included if they have coagulase negative staphylococcus or one of the bacterial pathogens listed below and if they meet any of the following criteria:

1. Any infant who is born at the reporting hospital and whose birth weight is between 401 and 1500 grams OR whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) should be included, regardless of where in the hospital the infant receives care.
2. Any outborn infant who is admitted to any location in the reporting hospital within 28 days of birth, without first having gone home, and whose birth weight is between 401 and 1500 grams OR whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) should be included, regardless of where in the hospital the infant receives care.
3. Any infant whose birth weight is over 1500 grams and who is admitted to a Neonatal Intensive Care Unit (NICU) in the reporting hospital within the first 28 days of life without first having gone home should be included, regardless of gestational age. A NICU is any location within the hospital in which newborn infants receive continuous positive airway pressure (CPAP) or intermittent mandatory ventilation (IMV).
4. Any infant whose birth weight is over 1500 grams and who dies at any location in the reporting hospital within 28 days of birth without first having gone home should be included. This includes inborn and outborn infants.

Bacterial Pathogens List

1. Achromobacter species [including Achromobacter xylosoxidans (also known as Alcaligenes xylosoxidans) and others]
2. Acinetobacter species
3. Aeromonas species
4. Alcaligenes species [Alcaligenes xylosoxidans and others]
5. Bacteroides species
6. Burkholderia species [Burkholderia capeciae and others]
7. Campylobacter species [Campylobacter fetus, C. jejuni and others]
8. Chryseobacterium species
9. Citrobacter species [Citrobacter diversus, C. freundii, C. koseri and others]
10. Clostridium species
11. Enterobacter species [Enterobacter aerogenes, E. cloacae, and others]
12. Enterococcus species [Enterococcus faecalis (also known as Streptococcus faecalis), E. faecium, and other Enterococcus species]
13. Escherichia coli
14. Flavobacterium species
15. Haemophilus species [Haemophilus influenzae and others]
16. Klebsiella species [Klebsiella oxytoca, K. pneumoniae and others]
17. Listeria monocytogenes
18. Moraxella species [Moraxella catarrhalis (also known as Branhamella catarrhalis) and others]
19. Neisseria species [Neisseria meningitidis, N. gonorrhoeae and others]
20. Pasteurella species
21. Prevotella species
22. Proteus species [Proteus mirabilis, P. vulgaris and others]

23. *Providencia* species [*Providencia rettgeri*, and others]
24. *Pseudomonas* species [*Pseudomonas aeruginosa* and others]
25. *Ralstonia* species
26. *Salmonella* species
27. *Serratia* species [*Serratia liquefaciens*, *S. marcescens* and others]
28. *Staphylococcus coagulase positive* [*aureus*]
29. *Stenotrophomonas maltophilia*
30. *Streptococcus* species [including *Streptococcus* Group A, *Streptococcus* Group B, *Streptococcus* Group D, *Streptococcus pneumoniae*, *Strep milleri* and others]

2a1.4 Denominator Statement (*Brief, narrative description of the target population being measured*):
Eligible infants who are in the reporting hospital after day 3 of life.

2a1.5 Target Population Category (*Check all the populations for which the measure is specified and tested if any*): Children

2a1.6 Denominator Time Window (*The time period in which cases are eligible for inclusion*):
After day 3 of life and within the first year of life.

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*):

Infants in the reporting hospital after day 3 of life or readmitted after day three of life are included if they meet any of the following criteria:

1. Any infant who is born at the reporting hospital and whose birth weight is between 401 and 1500 grams or whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) is included, regardless of where in the hospital the infant receives care.
2. Any outborn infant who is admitted to any location in the reporting hospital within 28 days of birth, without first having gone home, and whose birth weight is between 401 and 1500 grams or whose gestational age is between 22 weeks 0 days and 29 weeks 6 days (inclusive) is included, regardless of where in the hospital the infant receives care.
3. Any infant whose birth weight is over 1500 grams and who is admitted to a Neonatal Intensive Care Unit (NICU) in the reporting hospital within the first 28 days of life without first having gone home is included, regardless of gestational age. A NICU is any location within the hospital in which newborn infants receive continuous positive airway pressure (CPAP) or intermittent mandatory ventilation (IMV).
4. Any infant whose birth weight is over 1500 grams and who dies at any location in the reporting hospital within 28 days of birth without first having gone home is included. This includes inborn and outborn infants.

2a1.8 Denominator Exclusions (*Brief narrative description of exclusions from the target population*):
Exclude patients who do not meet eligibility criteria for birth weight, gestational age or NICU admission.
Exclude infants who are discharged home, transferred or die prior to day 3 of life.

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*):

1. Any infant who meets none of the following conditions is excluded:
 - Birth weight between 401 and 1500 grams

- Gestational age between 22 and 29 weeks.
 - Admitted to a neonatal intensive care unit within 28 days of birth.
 - Dies in the reporting hospital within 28 days of birth.
2. Outborn infants who are admitted to the reporting hospital more than 28 days after birth are excluded.
 3. Outborn infants who have been home prior to admission to the reporting hospital are excluded.
 4. Infants discharged home on or before day 3 of life are excluded.
 5. Infants who die on or before day 3 of life are excluded.
 6. Infants who transfer to another hospital on or before day 3 of life and who are not readmitted to the reporting hospital are excluded.
 7. Infants who transfer more than once prior to day 3 of life are excluded.

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):

N/A

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 risk adjustment process begins by using logistic regression to model the dichotomous measure with several case mix variables: gestational age and its quadratic term, APGAR score at 1 minute, maternal race, infant gender, multiple birth (Yes/No), vaginal delivery (Yes/No), birth location (Inborn/Outborn), major birth defect (Yes/No) and small for gestational age (Yes/No).

An estimate is made of the "systematic variation" associated with the hospital standardized morbidity ratios (SMRs) using the method suggested by Martuzzi and Hills (Martuzzi M and Hills M, Estimating the degree of heterogeneity between event rates using likelihood, Am J of Epi, 141, 4, 369-374 (1995). This method assumes that the SMRs are distributed gamma, and that deviations from the gamma distribution are associated with random variation. The systematic variation is used to "shrink" center SMR values and their confidence limits based on the number of infants reported. The values for centers with a smaller number of infants shrink more toward the mean of all centers than do centers with more infants. The adjusted rate for the hospital is shrunken using the calculated measure of systematic variation.

The shrinkage method described above is the "gamma-Poisson" approach to filtering random variation associated with Nosocomial Bacterial Infection as a risk adjusted indicator of performance. This approach has been used in other settings for documenting hospital performance. See, e.g., Simpson J et al, Analysing differences in clinical outcomes between hospitals, Qual Saf Health Care, 12, 257-262 (2003).

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:

[Attachment](#)

[NQF_0303_Coef_2006_2010.xlsx](#)

2a1.17-18. Type of Score: [Other](#) Adjusted rate and stadardized morbidity ratio (observed minus expected cases are also reported)

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.):

1. Determine the number of infants for a reporting period (usually a birth year) who meet the population criteria described above. Be sure that all eligible infants during the reporting period are identified. This number is termed N.
2. Using the definitions in the Network Manual of Operations, determine the number of infants who had nosocomial bacterial infection after day 3 of life and prior to discharge home for each of the N infants. This is the number of eligible infants who were diagnosed as having either coagulase negative staphylococcus and/or a late bacterial pathogen after day 3 of life. The number identified as having nosocomial bacterial infection is termed the “observed number with infection” or O for short.
3. For each of the N infants, calculate the expected value of infection by multiplying the coefficient times its covariate value for each covariate (coefficients provided on request). The covariates include:
 - Gestational Age in completed weeks (GA)
 - GA squared
 - Small for Gestational Age (data table provided on request)
 - Major birth defect (0=No, 1=Yes)
 - APGAR score at 1 minute (0 to 10)
 - Indicator variables for maternal race or ethnicity (0 or 1)
 - Hispanic
 - Black
 - White
 - Asian
 - Other
 - Birth location (0=Inborn, 1=Outborn)
 - Multiple gestation (0=No, 1=Yes)
 - Infant gender (0=Female, 1=Male)
 - Mode of delivery (0=C-Section, 1=Vaginal)
4. Add the expected values for each of the N infants to calculate the number of expected cases of nosocomial bacterial infection. This number is termed the “expected number with infection” or E for short.
5. Calculate the standardized morbidity ratio (SMRshrnk) for nosocomial bacterial infection using the values for O and E and applying the estimate for systematic variation (v_2), determined from Vermont Oxford Network analyses (provided on request).

$$\text{SMRshrnk} = (O + v_2) / (E + v_2)$$
 with standard error $\text{SESMRshrnk} = \sqrt{1/(E + (1/v_2))}$;
6. Calculate the shrunken, adjusted nosocomial bacterial infection rate (Rateshrnk) and its 95% confidence interval.

$$\text{Rateshrnk} = (\text{SMRshrnk} \times E) / N$$
 with standard error (SERateshrnk) equal to $\text{SESMRshrnk} \times E / N$.
 and 95% confidence interval for Rateshrnk equal to

$$\text{Rateshrnk} \pm 1.96 \times \text{SERateshrnk}.$$
7. Calculate the number of observed minus expected cases of nosocomial bacterial infection, adjusting for case mix and systematic variation ($O - \text{Eshrnk}$), and calculate the 95% control limits for $O - \text{Eshrnk}$.

$$O - \text{Eshrnk} = E / \text{SMRshrnk}$$
 with 95% control limits equal to $O - \text{Eshrnk} \pm 1.96 \times \text{SESMRshrnk} \times E$.

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

URL

<http://www.vtoxford.org/about/NQF%20Measure%200303.pdf>

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):

[Data for all eligible infants born during the reporting period are collected.](#)

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

[Registry Data](#)

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.*): [Vermont Oxford Network Database.](#)

2a1.27-29 Data Source/data Collection Instrument Reference Web Page URL or Attachment: URL
http://www.vtoxford.org/about/network_db.aspx

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

URL

<http://www.vtoxford.org/tools/ManualofOperationsPart2.pdf>

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

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

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

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

[Infants Born between 2001 and 2010 by Nosocomial Bacterial Infection \(Yes/No\)](#)

[-----Birth Weight Category \(grams\)-----](#)

[Infection <= 1000 1001-1500 1501-2000 2001-2500 > 2500](#)

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Yes	9,714	4,642	2,025	1,241	3,056
No	23,084	42,628	74,728	91,963	221,530

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

[Logistic regression models are run separately for very low birth weight infants and larger infants. Models are tested for performance with the area under the receiver operating characteristic curve \(AUC\). Changes in the AUC are monitored over time.](#)

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

[Area under ROC nosocomial bacterial infection models, 2006-2010, by infant population are shown below.](#)

Birth Year	Area under ROC
2006	
VLBW	0.734
Larger Infants	0.760
2007	
VLBW	0.728
Larger Infants	0.767
2008	
VLBW	0.733
Larger Infants	0.747
2009	
VLBW	0.723
Larger Infants	0.777
2010	
VLBW	0.735
Larger Infants	0.778

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:

Nosocomial bacterial bloodstream infections in neonatal intensive care units are related to increased mortality and are frequently caused by exposure to hospital staff. Risk factors include measures of prematurity (low birth weight, low gestational age and size for gestational age) as well as such factors as low APGAR score. Monitoring of bloodstream infections is critical for improving the quality of care (see, e.g., Tseng YC et al, Nosocomial bloodstream infection in a neonatal intensive care unit of a medical center: a three-year review, Journal of Microbiology, Immunology, and Infection, Sep 2002, 168-172). By taking into account risk factors associated with these infections, hospitals are given a better indication of performance. It is also important to control for random variation in performance, especially for small hospitals, since false signals can contribute to inefficient allocation of resources.

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):

The number of hospitals submitting data for the measure, with minimum and maximum number of submitted records for eligible infants born between 2006 and 2010, and percent of international hospitals are shown below.

Birth Year	Hospitals	% International	Minimum Infants	Maximum Infants
2006	165	16%	36	1478
2007	203	17%	53	1447
2008	242	18%	25	1596
2009	294	18%	30	1717
2010	325	17%	12	1568

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

The measure, including the list of bacterial pathogens, was developed by board certified neonatologists and reviewed by clinical experts in neonatal infection. The measure is reviewed annually by the Vermont Oxford Network Database Advisory Committee, consisting of national and international experts in the neonatal

community. The bacterial pathogens list was last revised in 2008.

Comprehensive business rules have been implemented in software applications so that each record submitted is tested for consistency, completeness and accuracy. Submitted records with errors must be corrected before data are finalized and reports of the measure are provided to hospitals.

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):*

Hosmer-Lemeshow goodness of fit statistics for nosocomial bacterial infection models, 2006-2010, by infant population are shown below.

Birth Year	Fit Chi-Square
2006	
VLBW	36.3
Larger Infants	12.4
2007	
VLBW	43.9
Larger Infants	12.7
2008	
VLBW	40.6
Larger Infants	16.0
2009	
VLBW	47.1
Larger Infants	11.0
2010	
VLBW	41.9
Larger Infants	26.1

The annual assessment of item definitions results in modifications to the definitions for measures collected by centers, as well as modifications to the bacterial pathogens list. Expert advisors to the registry directors provide recommendations for measure improvement and clarification of item criteria.

During data finalization, all records with errors must be corrected before reports of the measure are provided. When hospitals are unable to complete finalization, records for the birth year for that hospital are removed from the registry.

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):*
 The population measured includes premature infants and infants admitted to the neonatal intensive care unit within 28 days of birth, as well as infants who die in the hospital within 28 days of birth. The occurrence of infection is monitored after day 3 of life while the infant is hospitalized in the reporting hospital. For infants who transfer to another hospital, monitoring continues when the infant is readmitted to the reporting hospital. Infants who are discharged home are no longer monitored. These rules for tracking infants provide a reasonably homogenous population base for performance inferences and quality improvement decisions.

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

Business rules require that infants be hospitalized more than three days or the measure is not applicable. Other exclusions are also enforced by business rules that assure database integrity.

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

The following table shows the number of infants, number of records excluded and percent excluded for birth years 2006-2010.

Birth Year	Number of Infants	Number Excluded	Percent Excluded
2006	75,945	7,647	10.1%
2007	89,678	8,572	9.6%
2008	107,168	10,162	9.5%
2009	123,150	11,968	9.7%
2010	129,461	13,088	10.1%

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):*

The number of hospitals and number of patients vary by birth year based on the number of hospitals participating in the registry. Each reporting hospital submits data for all eligible infants as described in the Specifications section of this submission form. The number of hospitals for the period 2006-2010 is tabulated in item 2b2.1. above. The number of patients for this period is tabulated in item 2b3.3. above (Number of Infants minus Number Excluded).

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

The logistic regression model include the predictors listed below. Separate regression models are run for very low birth weight infants and larger infants.

- Gestational age in completed weeks and its quadratic term.
- Small for gestational age (SGA, Yes or No), defined as being in the 10th percentile or less for birth weight, given the infant's gestational age, the maternal race, the infant's gender and whether the infant was a singleton or multiple gestation. The United States Natality Datasets are used for calculating the 10th percentile values.
- Major birth defect (Yes or No).
- Multiple gestation (Yes or No).
- APGAR score at 1 minute (0 to 10).
- Infant gender (Male or Female).
- Maternal race (Hispanic, White, Asian or Other - Black is the reference category).
- Vaginal delivery (Yes or No).
- Birth location (Inborn or Outborn).

When one or more predictor variables is missing for infants with a known outcome measure, an imputation procedure is used based on Network or center specific rates for the missing values.

The adjusted rates are "shrunk" to remove random variation in signals of performance using an empirical Bayesian method. For an example of this method, see Martuzzi M and Hills M, Estimating the degree of heterogeneity between event rates using likelihood, Am J of Epi, 141, 4, 369-374 (1995) and Simpson J et al, Analysing differences in clinical outcomes between hospitals, Qual Saf Health Care, 12, 257-262 (2003).

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*):

For infants born in 2010, the coefficients with standard errors and chi-square values for very low birth weight infants and larger infants are listed separately below. These values are consistent with values obtained for infants born in previous years.

VLBW Infants:

Parameter	DF	Standard Estimate	Wald Error	Chi-Square	Pr > ChiSq
Intercept	1	-7.9290	1.7004	21.7427	<.0001
GAWeeks	1	0.8195	0.1248	43.1333	<.0001
GASQ	1	-0.0208	0.00228	83.4953	<.0001
Male	1	0.1015	0.0309	10.8079	0.0010
MultipleBirth	1	0.0164	0.0357	0.2094	0.6472
Vaginal	1	-0.0140	0.0337	0.1718	0.6785
BirthDefect	1	0.5357	0.0898	35.5700	<.0001
SmallForGA	1	0.5490	0.0514	114.2164	<.0001
AP1	1	-0.0208	0.00700	8.7861	0.0030
HispRace	1	0.0677	0.0495	1.8692	0.1716
WhiteRace	1	-0.0667	0.0378	3.1091	0.0779
AsianRace	1	-0.1357	0.0845	2.5765	0.1085
OthRace	1	0.1283	0.0979	1.7177	0.1900
Outborn	1	0.1838	0.0400	21.1029	<.0001

Larger infants:

VLBW Infants

Parameter	DF	Standard Estimate	Wald Error	Chi-Square	Pr > ChiSq
Intercept	1	36.3584	11.9060	9.3257	0.0023
GAWeeks	1	-2.1268	0.6761	9.8965	0.0017
GASQ	1	0.0277	0.00951	8.4761	0.0036
Male	1	0.0608	0.1821	0.1116	0.7384
MultipleBirth	1	-0.2306	0.2963	0.6059	0.4363
Vaginal	1	-0.0624	0.1822	0.1171	0.7322
BirthDefect	1	2.3944	0.2004	142.7884	<.0001
SmallForGA	1	0.00804	0.2659	0.0009	0.9759
AP1	1	-0.0732	0.0393	3.4786	0.0622
HispRace	1	-0.3089	0.3519	0.7704	0.3801
WhiteRace	1	-0.3410	0.2204	2.3947	0.1217
AsianRace	1	-0.7712	0.5002	2.3774	0.1231
OthRace	1	-13.3238	531.6	0.0006	0.9800
Outborn	1	0.4161	0.2025	4.2233	0.0399

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

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):

In 2010 reports were sent to 325 hospitals, and the measure was applicable for 116,373 infants.

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

If the 95% upper bound for the standardized morbidity ratio (SMR - observed value / expected value) is less than one, the hospital performance is classified as "better than expected"; if the 95% lower bound for the SMR is greater than one, the hospital performance is classified as "worse than expected"; if the 95% lower and upper bounds for the SMR includes one, performance is classified as "as expected."

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):

In 2010 45 hospitals performed better than expected, 32 performed better than expected and 248 performed as expected. Ninety-five percent confidence limits for the estimates were used to determine statistical significance.

For the unadjusted measure, the observed rates for key percentiles are shown below for infants born in 2010 for 325 infants:

Percentile Observed Percent

10th	0.0%
25th	0.9%
50th	2.2%
75th	4.2%
90th	6.5%

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):

N/A

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

N/A

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):

N/A

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): N/A

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

N/A

2.1-2.3 Supplemental Testing Methodology Information:

URL

<http://www.vtoxford.org/about/NQF%20Measure%200303.pdf>

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

If the Committee votes No, STOP

3. USABILITY

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (**evaluation criteria**)

C.1 Intended Actual/Planned Use (Check all the planned uses for which the measure is intended): [Public Reporting](#), [Quality Improvement \(external benchmarking to organizations\)](#), [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 with Benchmarking \(external benchmarking to multiple organizations\)](#), [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.]**

Performance results are made available to the members of the Vermont Oxford Network at: <https://nightingale.vtoxford.org> Participants in the Vermont Oxford Network may access a fully featured Internet reporting system (Nightingale), as well as printed reports, which document patient characteristics, treatment practices, morbidity, mortality, and length of stay for the institution. The reports also track performance over time, comparing the institution's performance to that of the Network as a whole and with subgroups of similar institutions.

Vermont Oxford Network members may make their performance available to the public at their discretion.

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: [Hospital acquired infections in neonatal intensive care units are related to increased mortality, morbidity, length of stay, and cost. Measuring and reporting performance allows care providers to identify higher than expected rates of infection and opportunities for improvement of practices.](#)

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): [N/A](#)

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

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

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

URL(s):

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

Performance results are used for quality improvement by the members of the Vermont Oxford Network: <http://www.vtoxford.org/about/membership.aspx>. Participants in the Vermont Oxford Network may access a fully featured Internet reporting system (Nightingale), as well as printed reports, which document patient characteristics, treatment practices, morbidity, mortality, and length of stay for the institution. The reports also track performance over time, comparing the institution's performance to that of the Network as a whole and with subgroups of similar institutions.

Performance results are also used by participants in the Vermont Oxford Network's Quality Improvement Collaboratives: <http://www.vtoxford.org/quality/nicq/nicq.aspx>

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:

There is strong evidence that hospital acquired infection in the NICU can be reduced by appropriate practices and QI interventions. Measuring and reporting performance allows care providers to identify opportunities to improve performance, and to implement practices that have been shown to reduce the frequency of hospital acquired infection.

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:

generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition, Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims), Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry)

4b. Electronic Sources: H M L I

4b.1 Are the data elements needed for the measure as specified available electronically (Elements that are needed to compute measure scores are in defined, computer-readable fields): ALL data elements are in a combination of electronic sources

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

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

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

A manual of operations for the registry is published annually, with definitions and criteria clearly operationalized for the measure. Comprehensive business rules are implemented in software to verify

records for consistency, completeness and accuracy. A definitive process is in effect to assure that the measure is not reported until data are complete and correct. Hospital contacts must verify that data for all eligible infants are submitted prior to finalization.

4d. Data Collection Strategy/Implementation: H ☐ M ☐ L ☐ I ☐

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

4d.1 Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues (e.g., fees for use of proprietary measures):

Patient identifiers are not collected in the registry. Confidentiality for each hospital member is strictly maintained. Procedures in place assure reasonable confidence that data are complete and accurate. There are no specific fees for this measure, although members of the Vermont Oxford Network pay an annual membership fee.

Overall, to what extent was the criterion, *Feasibility*, met? H ☐ M ☐ L ☐ I ☐

Provide rationale based on specific subcriteria:

OVERALL SUITABILITY FOR ENDORSEMENT

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

Rationale:

If the Committee votes No, STOP.

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

5. COMPARISON TO RELATED AND COMPETING MEASURES

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

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

0478 : Neonatal Blood Stream Infection Rate (NQI 03)

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? No

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

Both the numerator and denominator of the two measures are different. The risk adjustment method and method for controlling for random variation is not specified in NQF 0478.

5b. Competing Measure(s)

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

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

(Provide analyses when possible):

This measure is superior to NQF 0478 for the following reasons:

1. Our measure distinguishes coagulase negative staphylococcal infections from other bacterial pathogens. The criteria for coagulase negative staphylococcal infection are more stringent. Since coagulase negative staphylococcus may also be a contaminant of cultures the stringent criteria are superior. In addition, our two measures allow us to report separately on coagulase negative staphylococcal infections from other bacterial pathogens.
2. The population for our measure is more inclusive, allowing monitoring of all very low birth weight infants (birth weight 401 to 1500 grams or gestational age 22-29 weeks), as well as all larger infants who are admitted to the NICU within 28 days of birth or who die in the hospital within 28 days of birth.
3. Our risk adjustment methods are clearly specified and include methods for controlling for random variation. The latter is particularly important when the number of reported infants is small.
- 2.

CONTACT INFORMATION

Co.1 Measure Steward (Intellectual Property Owner): Vermont Oxford Network, 33 Kilburn St, Burlington, Vermont, 05401

Co.2 Point of Contact: Beth, Anderson, banderson@vtoxford.org, 802-865-4814-237

Co.3 Measure Developer if different from Measure Steward: Vermont Oxford Network, 33 Kilburn St, Burlington, Vermont, 05401

Co.4 Point of Contact: Beth, Anderson, banderson@vtoxford.org, 802-865-4814-237

Co.5 Submitter: Beth, Anderson, banderson@vtoxford.org, 802-865-4814-237, Vermont Oxford Network

Co.6 Additional organizations that sponsored/participated in measure development:

Co.7 Public Contact: Beth, Anderson, banderson@vtoxford.org, 802-865-4814-237, Vermont Oxford Network

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 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:

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.3 Year the measure was first released: 2008

Ad.4 Month and Year of most recent revision: 10, 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? 09, 2012

Ad.7 Copyright statement: Copyright © 2011 Vermont Oxford Network, Inc.

Ad.8 Disclaimers:

Ad.9 Additional Information/Comments:

Date of Submission (MM/DD/YY): 10/17/2011