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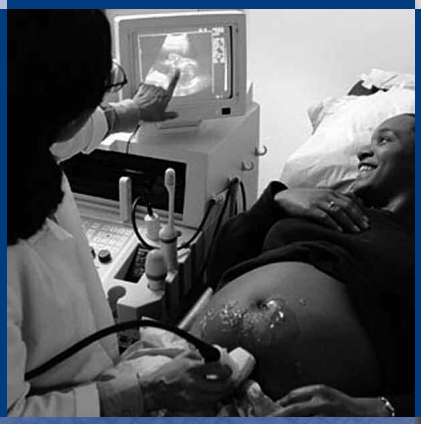

PERINATAL CARE

National Voluntary Consensus Standards for Perinatal Care 2008

A CONSENSUS REPORT

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Foreword

THERE ARE MORE THAN 4 MILLION BIRTHS per year in the United States, and pregnancy/childbirth is the second most common reason for hospital admission. Because the volume of maternity admissions is so high, deficiencies in perinatal care affect a large population of vulnerable patients and represent a significant opportunity for quality improvement. Yet there have been relatively few standardized measures in the field of perinatal care to assess and publicly report on the safety and quality of care. There is an enormous need for more standardized consensus standards in this area.

Mortality and morbidity associated with pregnancy and childbirth are substantial and to a large extent are preventable through the provision of high-quality perinatal care. Poor-quality care provided during the third trimester, labor and delivery, and the postpartum period translates into unnecessary complications, prolonged lengths of stay, costly neonatal intensive care unit admissions, and anxiety and suffering for patients and families.

The set of NQF-endorsed measures featured in this report are patient focused and address care provided by individual clinicians such as doctors, nurses, and midwives, both in hospitals and in freestanding birth centers. The perinatal standards fill gaps in quality measurement and measure care at critical points for the mother and baby from the third trimester through hospital discharge and reflect aspects of care that can be substantially influenced by provider performance. Ultimately, through public reporting and accountability, the standards—such as birth trauma rate for the mother and baby and relevant vaccinations for newborns—can increase patient safety and decrease serious complications from childbirth.

NQF thanks the members of the Perinatal Care Steering Committee and NQF Members for their commendable work in developing this much-needed measure set that can help improve the quality of healthcare for mothers and babies.

Janet M. Corrigan, PhD, MBA
President and Chief Executive Officer

National Quality Forum

The mission of the National Quality Forum is to improve the quality of American healthcare by setting national priorities and goals for performance improvement, endorsing national consensus standards for measuring and publicly reporting on performance, and promoting the attainment of national goals through education and outreach programs.

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Executive Summary

TO DATE, QUALITY MEASUREMENT AND REPORTING has focused primarily on common medical conditions such as acute coronary syndrome, pneumonia, and surgical performance, while the focus on maternal-child care has been limited. Morbidity and mortality associated with pregnancy and childbirth remain substantial and, research suggests, are to a large extent preventable through adherence to existing evidence-based guidelines. Because pregnancy/childbirth is the second most common reason for hospital admission, deficiencies in perinatal care affect a large population of vulnerable patients and represent a significant opportunity for quality improvement. However, without appropriate information about hospital performance at a national level, perinatal quality improvement efforts will be unfocused and incentives for improvement limited.

In 2003, the National Quality Forum (NQF) endorsed five measures for public reporting of hospital performance in obstetrical and newborn care, and through subsequent consensus projects NQF endorsed four additional measures specifically addressing prenatal care in the ambulatory setting. Despite these efforts, however, providers, consumers, and other stakeholders who use publicly reported performance measures are still faced with considerable gaps in the information available on the quality of perinatal care.

This report presents 17 consensus standards addressing care received during the last trimester of pregnancy through hospital discharge for both mother and newborn. The consensus standards address care provided by both individual clinicians (i.e., physicians and midwives) and facilities, including both hospitals and freestanding birthing centers. These standards reflect aspects of care—both processes and outcomes—that can be substantially influenced by provider performance. Four of the five measures previously endorsed by NQF have been retired and replaced by this measure set. The purpose of these consensus standards is to improve the quality of maternal-child care—through accountability and public reporting—by standardizing quality measurement in all relevant care settings.

National Voluntary Consensus Standards for Perinatal Care 2008

- Elective delivery prior to 39 completed weeks gestation
- Incidence of episiotomy
- Cesarean rate for low-risk first birth women
- Prophylactic antibiotic in C-section
- Appropriate DVT prophylaxis in women undergoing cesarean delivery
- Birth trauma rate measures (harmonized)
- Hepatitis B vaccine administration to all newborns prior to discharge
- Appropriate use of antenatal steroids
- Infants under 1500g delivered at appropriate site
- Nosocomial blood stream infections in neonates
- Birth dose of hepatitis B vaccine and hepatitis immune globulin for newborns of mothers with chronic hepatitis B
- Exclusive breastfeeding at hospital discharge
- First temperature within one hour of admission to NICU **AND**
- First NICU temperature <36ºC **(paired measures)**
- Retinopathy of prematurity screening
- Timely surfactant administration to premature neonates
- Neonatal immunization

Background

IN THE UNITED STATES, PREGNANCY/CHILDBIRTH is the second most common reason for hospital admission.[1] In 2005, 4.2 million childbirth-related hospital stays were recorded,[2] and during these stays the 5 most common procedures performed for patients ages 18 through 44 were related to pregnancy and childbirth.[3] Birth-related procedures were the most common procedures for infants.[4] Given the sizeable volume of maternity admissions, deficiencies in perinatal care can affect a large population of vulnerable patients. Morbidity and mortality associated with pregnancy and childbirth are substantial and, evidence suggests, are largely preventable through the delivery of high-quality perinatal care and adherence to evidence-based guidelines. Poor-quality care during the third trimester, labor and delivery, and the postpartum period can translate into unnecessary complications, prolonged lengths of stay, costly neonatal intensive care unit (NICU) admissions, and anxiety and suffering for patients and families. Moreover, numerous studies have documented persistent racial, ethnic, and socioeconomic disparities in maternal morbidity and mortality, preterm births, low birthweight infants, and other adverse outcomes.[5,6,7]

In 2003, the National Quality Forum (NQF) took the first step in standardizing measures for public reporting of hospital performance in obstetrical and newborn care with the endorsement of five voluntary consensus standards for perinatal care and services. An additional four consensus standards addressing aspects of prenatal care typically received in the ambulatory setting during first trimester of pregnancy were endorsed in 2006. Despite these efforts, because quality measurement and reporting efforts to date have primarily focused on medical conditions such as acute coronary syndrome, pneumonia, and surgical performance, the focus on maternal-child care has been limited, and considerable gaps in the information available on the quality of perinatal care remain.

In September 2007, with funding provided by the Hospital Corporation of America (HCA), NQF launched a new effort to fill these information gaps by seeking national voluntary consensus on a set of performance measures to assess the quality of perinatal services received during the last trimester of pregnancy through hospital discharge for both mother and newborn.

Strategic Directions for NQF

As NQF nears completion of its first decade, consideration of strategic issues to guide current and future activities has resulted in an expansion of NQF's mission to include three parts: 1) setting national priorities and goals for performance improvement, 2) endorsing national consensus standards for measuring and publicly reporting on performance, and 3) promoting the attainment of national goals through education and outreach programs. As greater numbers of quality measures are developed and brought to NQF for consideration, NQF must assist stakeholders in measuring "what makes a difference" and addressing what is important to achieve the best outcomes for patients and populations. An updated measurement framework, reviewed by NQF Members in December 2007, promotes shared accountability and measurement across episodes of care with a focus on outcomes and patient engagement in decisionmaking coupled with measures of the healthcare process and cost/resource use. For more information, see www.qualityforum.org.

Several strategic issues have been identified to guide consideration of candidate consensus standards:

DRIVING TOWARD HIGH PERFORMANCE. Over time, the bar of performance expectations should be raised to encourage the achievement of higher levels of system performance.

EMPHASIS ON COMPOSITE MEASURES. Composite measures provide much needed summary information pertaining to multiple dimensions of performance and are more comprehensible to patients and consumers.

MOVING TOWARD OUTCOME MEASUREMENT. Outcome measures provide information of keen interest to consumers and purchasers, and, when coupled with healthcare process measures, they provide useful and actionable information to providers. Outcome measures also focus attention on much-needed system-level improvements, because achieving the best patient outcomes often requires carefully designed care process, teamwork, and coordinated action on the part of many providers.

FOCUS ON DISPARITIES IN ALL THAT WE DO. Some of the greatest performance gaps relate to care of minority populations. Particular attention should be focused on the most relevant race/ethnicity/language/socioeconomic strata to identify relevant measures for reporting.

NQF's Consensus Development Process

Evaluating Potential Perinatal Consensus Standards

Candidate standards were solicited through an open Call for Measures in November 2007 and were actively sought by NQF staff through literature reviews and a search of the National Quality Measures Clearinghouse. In addition, as part of NQF's ongoing measure maintenance process, the five measures related to perinatal

care that were endorsed in 2003 were reconsidered alongside newly submitted candidate standards. A total of 33 measures were ultimately identified and evaluated by the Perinatal Care Steering Committee for appropriateness as voluntary consensus standards for accountability and public reporting. The Steering Committee evaluated the candidate standards using the standardized criteria derived from the work of the NQF Strategic Framework Board and endorsed by NQF of importance, scientific acceptability, usability, and feasibility (see www.qualityforum.org).

Relationship to Other NQF-Endorsed Consensus Standards

This report does not represent the entire scope of NQF work relevant to the quality of care for mothers and infants. As noted previously, NQF has endorsed several prenatal consensus standards addressing prenatal services provided in the outpatient setting, typically during the first trimester of pregnancy, in *National Voluntary Consensus Standards for Ambulatory Care—Part I: A Consensus Report*[8]*:*

- Screening for human immunodeficiency virus (HIV)
- Anti-D immune globulin administration
- Assessment of blood group (ABO) and D (Rh) type
- Blood group antibody testing

The full constellation of consensus standards, along with those presented in this report, provide a growing number of NQF-endorsed® voluntary consensus standards that directly and indirectly reflect the importance of measuring and improving quality of care. Organizations that adopt these consensus standards will promote the development of safer and higher-quality care for patients throughout the nation.

NQF-Endorsed Voluntary Consensus Standards for Perinatal Care

Overview

This report presents 17 consensus standards for perinatal care (Table 1). See Appendix A for the measure specifications. Four previously endorsed perinatal consensus standards have been retired from use. The purpose of these consensus standards is to improve the quality of healthcare through accountability and public reporting by standardizing quality measurement in all relevant care settings. All NQF-endorsed measures are fully disclosed and available for use by any interested parties (see www.qualityforum.org). The perinatal consensus standards are intended for use at various levels of analysis, as indicated for each measure in the following sections. Levels of analysis vary from the individual practitioner (e.g., physicians, midwives, and nurses) to small and large groups, hospitals, and freestanding birthing centers. The Perinatal Care Steering Committee noted that practice comparisons that fail standard tests of statistical significance are inappropriate and urged those adopting and utilizing these measures to address issues such as appropriate sample size responsibly.

Table 1: National Voluntary Consensus Standards for Perinatal Care 2008

MEASURE TITLE	MEASURE ID[a]	MEASURE DESCRIPTION AND REVIEW NUMBER[b]	LEVEL OF ANALYSIS	IP OWNER(S)[c]
Elective delivery prior to 39 completed weeks gestation*	0469	All singletons delivered at ≥37 completed weeks gestation that are electively delivered prior to 39 completed weeks gestation (PN-007-07)	Facility	HCA/ St. Marks Perinatal Center
Incidence of episiotomy*	0470	Number of vaginal deliveries with episiotomy procedures performed (PN-013-07)	Facility	Christiana Care Health Services NPIC
Cesarean rate for low-risk first birth women	0471	Proportion of livebirths born at or beyond 37.0 weeks gestation to women having their first delivery that are singleton (no twins or beyond) and vertex presentation (no breech or transverse positions) that had a cesarean birth (PN-010-07)	Facility, group, integrated system, or community	California Maternal Quality Care Collaborative

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*Time-limited endorsement.

[a] Upon NQF endorsement, each measure receives a unique NQF measure ID number.

[b] Review number.

[c] Intellectual property owner(s). For the most current specifications and supporting information, please refer to the IP owner:

AHRQ - Agency for Healthcare Research and Quality (www.ahrq.gov)
Asian Liver Center at Stanford (http://liver.stanford.edu)
CMQCC - California Maternal Quality Care Collaborative (www.cmqcc.org)
CDC - Centers for Disease Control and Prevention (www.cdc.gov)
Child Health Corporation of America (www.chca.com)
Christiana Care Health Services (www.christianacare.org)
CWISH - Council of Women and Infants Specialty Hospitals (www.cwish.org)
HCA - Hospital Corporation of America, Inc./St. Marks Perinatal Center (www.hcahealthcare.com)
Massachusetts General Hospital (www.massgeneral.org)
NPIC - National Perinatal Information Center (www.npic.org)
Providence St. Vincent Medical Center (www.providence.org)
Vermont Oxford Network (www.vtoxford.org)

Table 1: National Voluntary Consensus Standards for Perinatal Care 2008

MEASURE TITLE	MEASURE ID[a]	MEASURE DESCRIPTION AND REVIEW NUMBER[b]	LEVEL OF ANALYSIS	IP OWNER(S)[c]
Prophylactic antibiotic in C-section	0472	All women undergoing cesarean delivery without evidence of prior infection or already receiving prophylactic antibiotics for other reasons who received prophylactic antibiotics within one hour prior to surgical incision or at the time of delivery (PN-011-07)	Facility	Massachusetts General Hospital
Appropriate DVT prophylaxis in women undergoing cesarean delivery*	0473	Women undergoing cesarean delivery who receive either fractionated or unfractionated heparin or pneumatic compression devices prior to surgery (PN-006-07)	Facility	HCA/ St. Marks Perinatal Center
Birth trauma rate measures (harmonized)*	0474	Number of infants with specific birth traumas (PN-002/019-07)	Facility	AHRQ NPIC
Hepatitis B vaccine administration to all newborns prior to discharge*	0475	Number of live newborns discharged from the hospital who were administered hepatitis B vaccine prior to discharge (PN-001-07)	Facility clinician, group, or plan	CDC
Appropriate use of antenatal steroids*	0476	Total number of mothers who delivered preterm infants (24-32 weeks with preterm premature rupture of membranes or 24-34 weeks with intact membranes) who received antenatal steroids at any time prior to delivery (PN-016-07)	Facility	Providence St. Vincent Medical Center CWISH
Infants under 1500g delivered at appropriate site	0477	The number per 1,000 livebirths over 24 weeks gestation weighing less than 1500g delivered at hospitals not appropriate for that size infant (PN-022-07)	Facility, integrated system, or community	California Maternal Quality Care Collaborative

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Table 1: National Voluntary Consensus Standards for Perinatal Care 2008

MEASURE TITLE	MEASURE ID[a]	MEASURE DESCRIPTION AND REVIEW NUMBER[b]	LEVEL OF ANALYSIS	IP OWNER(S)[c]
Nosocomial blood stream infections in neonates*	0478	Selected bacterial blood stream infections per 1,000 qualifying neonates (PN-003-07)	Facility	AHRQ
Birth dose of hepatitis B vaccine and hepatitis immune globulin for newborns of mothers with chronic hepatitis B*	0479	Percentage of neonates born to hepatitis B surface antigen-positive mothers who receive a birth dose of hepatitis B vaccine and hepatitis B immune globulin within 12 hours of birth (PN-025-07)	Facility	Asian Liver Center at Stanford University
Exclusive breastfeeding at hospital discharge	0480	Livebirths not discharged from the NICU who were fed by "breast only" since birth (PN-021-07)	Facility, integrated system, or community	California Maternal Quality Care Collaborative
PAIRED MEASURES				
First temperature within one hour of admission to NICU	0481	Proportion of infants with weights between 501-1500g whose first temperature was measured within one hour of admission to the NICU (PN-029-07A)	Facility	Vermont Oxford Network
AND				
First NICU temperature <36°C	0482	Proportion of infants with weights between 501-1500g whose first temperature was taken within one hour of admission to NICU whose first temperature was <36°C (PN-029-07B)	Facility	Vermont Oxford Network

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Table 1: National Voluntary Consensus Standards for Perinatal Care 2008

MEASURE TITLE	MEASURE ID[a]	MEASURE DESCRIPTION AND REVIEW NUMBER[b]	LEVEL OF ANALYSIS	IP OWNER(S)[c]
Retinopathy of prematurity screening	0483	Number of infants born at 22 to 29 weeks gestation hospitalized at the postnatal age at which a retinal eye exam is recommended by the AAP who received a retinal exam for retinopathy of prematurity (PN-030-07)	Facility	Vermont Oxford Network
Timely surfactant administration to premature neonates	0489	Number of infants born at 22 to 29 weeks gestation who were treated with surfactant at any time who received the surfactant within 2 hours of birth (PN-031-07)	Facility	Vermont Oxford Network
Neonatal immunization	0145	Neonates with a length of stay greater than 60 days who receive DTaP, Hepatitis B, IPV, Hib, and PCV vaccines according to current AAP guidelines (PN-032-07)	Facility	Child Health Corporation of America

Endorsed Measures

0469[i] Elective delivery prior to 39 completed weeks gestation

(HCA/St. Marks Perinatal Center) *PN-007-07*[ii]

This facility-level intermediate outcome standard measures the number of infants delivered electively between 37 and 39 weeks of gestation, providing an assessment of how well providers are adhering to the guidelines of the American College of Obstetricians and Gynecologists (ACOG) restricting elective delivery (i.e., deliveries without maternal or fetal indication for delivery before the onset of spontaneous labor) prior to 39 completed weeks of gestation. The measure developer presented unpublished data from a recent analysis of 17,000 births in 24 HCA hospitals over a period of 3 months that showed that 31 percent of deliveries were elective and that 37 percent of those elective deliveries were performed at less than 39 weeks. Of infants delivered at 37 weeks, almost 20 percent of them required more than routine newborn care in a higher-level nursery, while only 8 percent of those delivered at 38 weeks and 5 percent of those delivered at 39 weeks needed additional care.

[i] NQF measure ID number.

[ii] Review number.

The Steering Committee unanimously agreed that this measure addresses an important and highly actionable aspect of perinatal care, because morbidity associated with unnecessary prematurity can be significantly diminished with proper adherence to existing guidelines. The Committee clarified that the measure is applicable only to singletons, because a significant body of data demonstrate that there is an increase in stillbirth deliveries after 38 weeks with twins. The Committee acknowledged that patient and provider education both would be important and necessary to overcome existing misconceptions that elective early delivery is generally without risk. Because the measure is new and has not yet been tested, the Committee voted in favor of a two-year, time-limited endorsement. The measure developer agreed to the Steering Committee's request to perform additional analyses to further identify what maternal groups have the highest rates of elective inductions and cesarean sections prior to 39 weeks.

An appeal was lodged against endorsement of the measure, with a specific request that the measure be expanded to include all elective deliveries prior to 39 weeks. The focus of the measure is to address inappropriate elective deliveries during the timeframe that is considered "full term," and no data were available to identify the extent to which "elective" premature deliveries are being performed during the "late preterm" period prior to 37 weeks. The Consensus Standards Approval Committee (CSAC) discussed the appeal and agreed that it would be helpful to review data on elective delivery prior to 37 weeks. The CSAC rejected the appeal.

0470 **Incidence of episiotomy**

(Christiana Care Health Services/National Perinatal Information Center [NPIC]) *PN-013-07*

This intermediate outcome measure assesses the percent of vaginal deliveries during which an episiotomy procedure was performed, excluding deliveries complicated by shoulder dystocia. Although a 2006 ACOG Practice Bulletin declared that there is insufficient objective, evidence-based data to support the liberal or routine use of episiotomy,[9] the procedure has been and remains commonplace. According to the *National Vital Statistics Report,* 33 percent of U.S. women who gave birth vaginally in 2000 had an episiotomy.[10] Additionally, studies of midline episiotomy use have demonstrated that the procedure is associated with an increased risk of severe perineal tears, including third- and fourth-degree lacerations,[11,12] with an associated increased risk of perineal pain,[13] sexual dysfunction,[14] and anal incontinence.[15]

The Steering Committee agreed that morbidity associated with this procedure could be significantly diminished with proper adherence to existing guidelines and that measuring episiotomy rates would draw much needed attention to this actionable aspect of maternal care. Committee members agreed that the measure will be useful at both the facility and—with proper sample sizes—the clinician level and concurred with the measure developer's opinion that as a "targetable" antecedent to perineal tears that is amenable to intervention, episiotomy rate would provide a more accurate reflection of quality than the currently endorsed 3rd and 4th Degree Laceration measure.

(The Committee noted that sample size is an implementation issue that must be addressed responsibly by those implementing the measure.)

Although the Steering Committee acknowledged that what constitutes an "ideal" episiotomy rate is not known, and that rates for this measure will not and should never be zero, members agreed that the data generated from this measure will nonetheless be very useful for comparison among facilities. Thus, because this is a new and as yet untested measure, the Committee voted unanimously in favor of a two-year time-limited endorsement, during which time measure testing can be completed. Of note, the measure developers explained that ICD-9-CM coding practices do not currently allow for distinction between tears resulting from episiotomies and those occurring spontaneously. However, the Expert Committee of Coders recently has rectified this situation with coding changes implemented in October 2008. The measure developers agreed that the specifications of the measure do not support measurement at the individual clinician level.

0471 **Cesarean rate for low-risk first birth women (a.k.a. NTSV [nulliparous, term, singleton, vertex] cesarean rate)**

(California Maternal Quality Care Collaborative [CMQCC])
PN-010-07

This intermediate outcome measure was developed for use at the facility, group, system, or community level. The California Maternal Quality Care Collaborative has used this measure since 2000 to focus attention on the maternal population most affected by elective medical practices such as induction and early labor admission—the first-time mother. The variation in cesarean rates in this population is striking: States,[16] hospitals within a state,[17,18] and physicians within a hospital[19] have rates that vary as much as three- to fivefold. And although some hospitals now have cesarean rates exceeding 50 percent, evidence indicates that facilities with rates as low as 15 percent to 20 percent have equivalent infant and better maternal outcomes.[20] Several studies have linked higher cesarean rates to worse neonatal outcomes.[21,22,23] Main et al.[24] found that more than 60 percent of the variation among hospitals can be attributed to first birth labor induction rates and first birth early labor admission rates. In addition, many studies have demonstrated that physician factors, rather than patient characteristics or obstetric diagnoses, are the major drivers for the differences in rates within a hospital.[25,26] A "Listening to Mothers" survey by Childbirth Connection found that 30 percent of C-section patients felt pressured to have the surgery.

The Steering Committee members agreed that although there are no existing guidelines for an "appropriate" C-section rate, the current degree of provider variation in this aspect of care is unfounded. Moreover, the Committee noted that the impact of cesarean delivery on the first-time mother is substantial, because subsequent deliveries likely will be surgical as well. The Committee appreciated that the measure has proven usable and has been associated with decreased cesarean rates where implemented. However, the Committee acknowledged that the lack of a code designating nulliparous women might make implementation on a national level challenging and recommended that usability be reassessed

during measure maintenance review. The Steering Committee also recommended that because an age-associated linear increase in cesarean rates has been noted, reported results should be stratified by maternal age.

0472 **Prophylactic antibiotic in C-section**

(Massachusetts General Hospital) *PN-011-07*

This facility-level process indicator is a measure of providers' adherence to the guidelines of the Infectious Disease Society of America and ACOG for prophylactic antibiotic administration for cesarean deliveries either within one hour prior to surgical incision or at the time of delivery. The developer noted that cesarean section is the most important risk factor for infectious complications of delivery and that the administration of prophylactic antibiotics is a well-established quality and safety practice. ACOG recommends this practice for all cesarean deliveries, regardless of patients' risk factors for infection.[27,28] The Steering Committee agreed that the measure addresses an important and highly actionable perinatal health issue for which there is considerable provider variation and substantial room for improvement. More-over, the measure, which has been in use in the MassHealth Pay for Performance Program since 2007, is complementary to the NQF-endorsed Surgical Care Improvement Project Prophylactic Antibiotics in Surgery measure, from which C-section patients are excluded. The Steering Committee unanimously recommended this measure for endorsement.

0473 **Appropriate DVT prophylaxis in women undergoing cesarean delivery**

(HCA/St. Marks Perinatal Center) *PN-006-07*

This facility-level process standard measures adherence to the guidelines of ACOG and the American College of Chest Physicians for deep venous thrombosis (DVT) prophylaxis for patients with various risk factors.[29,30] Venous thromboembolic disease is the leading cause of maternal morbidity and mortality. Pregnant women have five times the risk of venous thromboembolism compared to nonpregnant women, and several common risk factors, such as cesarean section, obesity, and age over 40 years increase the risk even further. The guidelines indicate that surgery lasting longer than 30 to 45 minutes and pregnancy are risk factors that, if present together, require DVT prophylaxis regardless of whether other predisposing factors (e.g., obesity) are present.

The Steering Committee noted that, although not all C-sections last longer than 45 minutes, it is impossible to reliably predict the duration of surgery. It therefore concluded that all women undergoing cesarean deliveries are high risk and should receive prophylaxis. The Committee acknowledged that specific studies of thromboprophylaxis for cesarean section are limited and, to date, inconclusive, but also noted that trials in nearly all other surgical populations have demonstrated the importance and effectiveness of DVT prophylaxis. Given the potentially devastating consequences of this outcome, the Steering Committee believed that without evidence to the contrary, these findings are applicable to the pregnant

surgical population as well. Accepted prophylactic regimens include fractionated, unfractionated, or low-molecular weight heparin or pneumatic compression devices.[31] The Steering Committee did note, however, that given existing concerns with medical thromboprophylaxis in women undergoing cesarean section, the use of a knee- or thigh-length pneumatic compression device is generally preferable in most patients. These devices should be placed and activated just prior to the onset of surgery and continued until the patient is fully ambulatory. In some emergency cases, the need to expedite the cesarean procedures may properly override the concern for preoperative thromboprophylaxis.

Notably, the Committee also considered an outcome measure of maternal DVT/pulmonary embolism incidence (PN-018-07). Although Committee members acknowledged NQF's strategic movement toward outcome measures, they agreed that the low incidence of this particular outcome (i.e., 0 percent to 1 percent incidence per year) would be of little use in comparing providers.

An appeal was lodged against the endorsement of this measure, citing lack of evidence supporting DVT prophylaxis in patients undergoing cesarean section. The CSAC noted that there is evidence that pregnant patients are at high risk for DVT and that there is strong evidence that DVT prophylaxis reduces the incidence of DVT in surgical patients—and cesarean section is considered major abdominal surgery. The CSAC rejected the appeal.

0474 **Birth trauma rate**

(Agency for Healthcare Research and Quality [AHRQ]/ NPIC) *PN-002/019-07*

Two similar facility-level outcome indicators measuring the relative occurrence of various birth traumas, both based on administrative data, were submitted by AHRQ and NPIC. The Steering Committee agreed that a measure of birth trauma would provide valuable information and requested that the two organizations harmonize the differences in their measure specifications. The developers agreed, and the measures ultimately were aligned to include the following injuries: subdural, cerebral, and epicranial subaponeurotic hemorrhages; long bone fractures; injuries to the spine and spinal cord; facial nerve and other cranial and peripheral nerve injuries; eye damage and traumatic glaucoma; hematoma of the liver, testes, and vulva; rupture of the liver and spleen; and scalpel wounds. Brachial plexus injuries and unspecified birth traumas were excluded from the harmonized measure. Although both of the original measures excluded infants weighing less than 1500g, the Steering Committee requested that this be changed to 2000g to exclude smaller neonates more prone to injury. As the Committee suggested, both inborn neonates and those transferred in on the day of birth are included.

Notably, the majority of the Steering Committee members recommended that the harmonized measure be advanced without the hierarchical risk adjustment originally utilized by the AHRQ measure. Both of the measure developers agreed to this recommendation. Some Committee members expressed concern

that the lack of risk adjustment would place facilities that perform a disproportionate number of high-risk deliveries at a disadvantage; however, most members believed that even the most advanced risk models do not completely correct for patient population variations and that most consumers will mistakenly assume that problems of data comparability have been completely corrected through the risk-adjustment process. Moreover, the Steering Committee noted that the interpretation of results will be made even more complex, because the categories of birth trauma in these measures range from the relatively clinically insignificant (e.g., a superficial scalpel wound) to the devastating (e.g., splenic rupture). As such, the majority of the Committee members agreed that reporting the "straight, unmanipulated" data would be more comprehensible and meaningful to consumers and that performance variations resulting from disparate patient populations can be effectively explained when reported. The Steering Committee stressed the importance of potential consumers of perinatal services discussing the data with a trusted provider before making final decisions on where to receive care. Such communication is important for all of the endorsed measures presented in this report.

Notably, even after the measure developers agreed to make the recommended changes, the Steering Committee expressed continued consternation about the wide variety of types and severity of injuries coded in the measures. One member opposed to endorsement suggested that birth trauma rate is not a good indicator of quality, because the rarity of the events being measured allows for little to no discernable statistical variation among providers. Moreover, several Committee members voiced concern that the number of concessions made during the harmonization process might have compromised the original measures' validity and that the resulting measure is, in effect, new and untested. Given these concerns, the Steering Committee recommended that the harmonized measure be considered for time-limited, rather than full, endorsement to allow for field testing. Moreover, the Committee suggested that the two-year testing period should be used to determine whether provider variation can be effectively detected by the measure, and that if it cannot, endorsement should be rescinded at the time of review.

0475 **Hepatitis B vaccine administration to all newborns prior to discharge**

(Centers for Disease Control and Prevention [CDC])
PN-001-07

This process measure, developed for use at the facility, clinician, group, or plan level, assesses the percentage of newborns administered hepatitis B vaccine prior to hospital or birthing facility discharge, in accordance with CDC's comprehensive hepatitis B immunization strategy. Administration of a dose of hepatitis B vaccine to all newborns prior to hospital discharge is recommended by the Advisory Committee on Immunization Practices (ACIP) and is supported by the American Academy of Pediatrics (AAP), ACOG, and the American Academy of Family Physicians. Nonetheless, the most recent CDC National Immunization Survey revealed that only 48.8 percent of newborns in the United States received a birth dose of the vaccine, with a range of

14.2 percent to 82.7 percent, depending on the state.[32]

Although the Steering Committee supported the measure, the majority of the members voiced concern that the lack of an exclusion for parental refusal does not reflect current practices and would improperly fault facilities when pediatricians recommend to parents that the first vaccine dose be administered as an outpatient. Others argued that because current guidelines recommend that the first dose be administered at hospital discharge, endorsement of this measures "as is" would promote proper adherence to these recommendations. Ultimately, however, the Committee agreed to recommend the measure, with the condition that the exclusion for parental refusal be incorporated into the measure. The measure developer agreed to this change. The Committee acknowledged that this modification would increase burden, because chart reviews will be required to identify the exclusion. Because the measure is new and testing has not yet been performed, the measure was recommended for time-limited endorsement.

0476 **Appropriate use of antenatal steroids**

(Providence St. Vincent Medical Center/Council of Women and Infants Specialty Hospitals [CWISH]) *PN-016-07*

This facility-level process standard is a measure of providers' adherence to the National Institutes of Health (NIH) 1994 and 2000 consensus statements recommending that a single course of corticosteroids be given to all pregnant women between 24 and 34 weeks of gestation who are at risk of preterm delivery occurring within the next 7 days to reduce the risks of prenatal mortality, respiratory distress syndrome, and other morbidities.[33,34] Although the scientific basis for the use of prenatal steroid therapy to promote fetal lung maturation is extensive and convincing, NIH reported in 1994 that fewer than 20 percent of women who were candidates for steroid therapy for preterm labor received it. The Committee members thus agreed that there is a strong evidence base for this measure and that it addresses an important and actionable aspect of perinatal care for which there is considerable provider variation and ample room for improvement. Although some debate occurred regarding whether "preterm" is better defined by dates or by birthweight, the Committee largely appreciated that this measure is consistent with the definition contained in the current ACOG guidelines (i.e., between 24 and 32 weeks with preterm premature rupture of membranes or between 24 and 34 weeks with intact membranes). The Committee agreed that, even though this measure requires chart review, it effectively captures a greater portion of the at-risk population than would a weight-based measure, because larger preterm babies would not be included in the denominator of the weight-based measure. One Committee member argued that it is the larger preterm babies that would not be captured in a weight-based measure who are often at greatest risk for respiratory distress. Ultimately, the Steering Committee voiced strong support for this measure and, because the measure is new and largely untested, the Committee recommended it for two-year time-limited endorsement.

0477 **Infants under 1500g delivered at appropriate site**

(California Maternal Quality Care Collaborative) *PN-022-07*

This is a facility- and system-level intermediate outcome measure that assesses whether neonates weighing <1500g are delivered at hospitals equipped to care for infants of that size. Premature and low birthweight newborns generally require neonatal intensive care at high-level nurseries. California and other states have shown that infants weighing <1500g have significantly better outcomes if delivered in a facility with immediate access to a Regional or Community Level III NICU.[35] Nonetheless, there has been a recent shift toward caring for these high-risk infants at lower-level facilities. Moreover, the measure developer noted that significant regional- and hospital-level variation has been documented with the measure's use in California.

Several Steering Committee members acknowledged the importance of the topic of this measure, but they suggested that its use might be unfair to rural facilities, because in rural areas there may be no hospitals with high-level NICUs close enough for transfer. However, the measure developer noted that California's rural hospitals generally have performed well on this measure, while large urban areas have not. The developer thus suggested that the measure is more a reflection of provider judgment than of resource availability. Other Steering Committee members suggested that the lack of consistent NICU-level designation across the country might complicate the implementation of this measure nationally. The developer responded that the measure can be calculated for a given facility using its existing designation. Both the developer and the Steering Committee agreed that endorsement of this measure might ultimately lead to a national effort to standardize the categorization and nomenclature of NICU facilities across the country, encourage appropriate and early transfer of high-risk patients, and promote regionalization, because hospitals will need to work together to perform well. The Steering Committee thus recommended that this measure be recommended for endorsement.

In response to questions from the CSAC, the measure developer clarified the specifications of the measure to include capturing the information on whether a facility provides services consistent with AAP-designated Level III subspecialty NICUs,[36] which have the personnel and equipment to care for infants weighing <1500 grams. Hospitals without Level III NICUs should have low rates for this measure, indicating the appropriate transfer of a mother at risk of preterm delivery to a facility capable of providing Level III care for a very low birthweight infant.

0478 **Nosocomial blood stream infections in neonates**

(AHRQ) *PN-003-07*

This is a facility-level outcome measure that assesses the number of bacterial bloodstream infections (BSIs) in infants between days 0 and 28 of life. Nosocomial bacteremia is a significant problem for infants admitted to NICUs and other hospital units. This is especially true for very low birthweight infants, who are at high risk for infection because of their

immature immune systems, combined with the need for invasive monitoring and supportive care.[37,38,39] Reported nosocomial infection rates range from 6 percent to 33 percent, but the rate varies widely among different centers. Mortality rates are high, and infections result in increased length of stay, as well as increased hospital costs and charges.[40,41,42] Effective preventive measures range from simple handwashing protocols or closed medication delivery systems to more elaborate multidisciplinary quality improvement plans involving handwashing, nutrition, skin care, respiratory care, vascular access, and diagnostic practices. All of these interventions have been shown to reduce infection rates substantially.[43,44,45]

The Steering Committee agreed that this measure addresses a highly important perinatal health outcome that can be minimized with proper adherence to existing guidelines and that although the measure is limited to BSIs, it is an acceptable proxy measure for healthcare-acquired infection rates. The Committee believed that excluding patients with lengths of stay of fewer than two days will adequately focus the measure exclusively on infections acquired in the hospital. Finally, the Committee appreciated the fact that the measure focuses on the highest risk patients (i.e., low birthweight and very low birthweight neonates and neonates that have undergone invasive procedures). However, one Committee member noted that proper identification of patients to be included in the numerator may prove challenging, because sepsis is rarely recorded as a primary diagnosis. Nonetheless, the Committee unanimously agreed that the measure is of sufficient importance to justify a recommendation for time-limited endorsement, during which the measure's reliability and its efficacy in contributing to performance improvement can be demonstrated.

0479 Birth dose of hepatitis B vaccine and hepatitis immune globulin for newborns of mothers with chronic hepatitis B

(Asian Liver Center at Stanford University) *PN-025-07*

Most individuals chronically infected with hepatitis B virus (HBV) acquire their infection at birth through mother-to-child transmission, and more than 90 percent of newly infected infants develop chronic hepatitis B.[46] The time of birth is the critical period not only for acquisition of chronic HBV infection, but also for its prevention—prophylaxis against HBV transmission is most effective when it is administered within 12 hours of birth.[47] According to the 2005 ACIP recommendations, all infants born to HBsAg-positive women should receive the HBV vaccine and hepatitis B immune globulin within 12 hours of birth, complete the HBV vaccine series after age 24 weeks, and undergo postvaccination serological testing for hepatitis B surface antibody (anti-HBs) and HBsAg between 9 and 18 months of age. Of the estimated 20,000 infants born each year to women with chronic hepatitis B, fewer than 50 percent of them are currently identified.[48,49]

The Steering Committee unanimously agreed that this facility-level process measure addresses a highly important perinatal health issue for which the potentially devastating consequences are largely avoidable with proper adherence to existing evidence-based guidelines. The Committee did acknowledge that the denominator population will be small and thus

questioned how meaningful the measure would be in public reporting initiatives. However, given the importance of this issue, all members agreed to recommend the measure for time-limited endorsement during which testing can be completed and measure performance can be demonstrated. At the Steering Committee's request, the developer agreed to specify in the numerator the 12-hour timeframe during which prophylaxis should be administered.

0480 **Exclusive breastfeeding at hospital discharge**

(California Maternal Quality Care Collaborative)
PN-021-07

This outcome standard, created for use at the facility, system, and/or community level, assesses the proportion of live births not discharged from the NICU who had newborn genetic screening and who were exclusively fed by breast since birth. Exclusive breastfeeding for the first six months of life has long been the expressed goal of the World Health Organization,[50] the Department of Health and Human Services,[51] AAP,[52] and ACOG.[53] Exclusive breastfeeding is now a Healthy People 2010 measure and is routinely reported by CDC.[54] Many states, including California,[55] also report it at the hospital level. The data in California have been used for several major intervention projects at county and regional levels. A recent Cochrane review substantiates the benefits.[56] More recently, much evidence has focused on the prenatal and intrapartum period as critical for the success of exclusive (or any) breastfeeding.[57,58,59] Exclusive breastfeeding rates during hospital stays for birth have been calculated by the California Department of Public Health for the last several years using newborn genetic disease testing data. Rates during the birth hospitalization have been found to range from 8 percent to over 90 percent. Several disadvantaged populations have lower rates of breastfeeding (e.g., African Americans, Latinas), but many studies have found that these low rates can be overcome through active encouragement and interventions by providers.

The Steering Committee unanimously agreed that this is an important measure and appreciated that its use in California has resulted in improved performance and has been linked with improved outcomes. One Committee member questioned whether the measure could be improved if it were risk adjusted. The measure developer reported that both maternal age and race had been considered and were found to be amenable to intervention in studies, suggesting that these variables are not a true barrier and can be overcome through efforts to properly educate patients. The developer noted, however, that although the measure is reported as a whole, California does stratify results to identify problem areas. Two Committee members had reservations regarding the measure's strict definition of "exclusive breastfeeding," which does not include infants who received even a single bottle-feed before discharge. The developer countered by remarking that CDC is moving toward recommending "exclusive feeding" in its guidelines and that the literature suggests that breast-feeding rates are lower at both three and six months when there is *any* supplemental feeding in the hospital. Moreover, there is little variation in California among hospitals when looking at "any breastfeeding," while considerable

variation exists among hospitals when looking at "exclusive breastfeeding," suggesting that the "exclusive" definition can be better used as a vehicle for performance improvement. Finally, one Committee member expressed serious concerns that infants of HIV-positive mothers are not excluded from the measure, despite universal agreement that this is an absolute contraindication to breastfeeding. However, the developer noted that current Healthy People 2010 goals expect performance to be only approximately 70 percent. This allows for 30 percent of the eligible population to be excluded for a variety of medical reasons—one of which would be HIV positivity. The measure developer asserted that because the highest rate of HIV-positive mothers in any given region is only 2 percent, the measure provides sufficient leeway for this contraindication. The developer also noted that the underlying issue is one involving existing data sources, because newborn screening forms currently do not include a place to identify breastfeeding contraindications.

Ultimately, despite these concerns, the majority of the Steering Committee members agreed that this measure will promote an important public health goal and recommended that it be further considered for endorsement.

PAIRED MEASURES

0481 **First temperature within one hour of admission to NICU**
(Vermont Oxford Network) *PN-029-07A*

AND

0482 **First NICU temperature <36°C**
(Vermont Oxford Network) *PN-029-07B*

Hypothermia on admission to the NICU occurs frequently in very low birthweight and preterm neonates, varies significantly among hospitals, and is associated with increased risk of morbidity and mortality. In 2006, the Vermont Oxford Network Database identified that 61 percent of the 46,000 infants weighing 501g-1500g from 632 hospitals had admission temperatures below 36.5°C (25 percent of the hospitals had rates over 76 percent), and rates varied dramatically among hospital units. The median temperatures on admission ranged from 35.3°C at 23 weeks to 36.4°C at 29 weeks.[60] In a study of more than 5,000 infants weighing 401g-1499g from 15 centers in the National Institute of Child Health and Human Development Neonatal Research Network in 2002 and 2003, 50 percent had admission temperatures under 36°C.[61] After adjusting for patient characteristics, admission temperature was found to be inversely related to the risks for mortality and late onset sepsis. The developer of this facility-level measure has thus postulated that improved attention to thermoregulation in the delivery room and during transport to the NICU could substantially reduce the frequency of hypothermia on admission and might ultimately improve rates of morbidity and mortality.

Although Steering Committee members unanimously agreed that this intermediate outcome measure addresses a highly important aspect of perinatal care, it was noted that measurement burden has not been assessed for providers who are not members of the Vermont Oxford Network. Nonetheless, it was agreed that given the importance of this measure, endorsement is both justified and would serve to promote quality improvement. However, the Steering Committee recommended that, because there are two distinct data items considered within the measure, it should be broken down into two complementary indicators: First Temperature Within One Hour of Admission to NICU and First NICU Temperature <36°C. Committee members believed that these paired measures would be "cleaner" and more easily collected and reported.

0483 **Retinopathy of prematurity screening**

(Vermont Oxford Network) *PN-030-07*

This facility-level process of care measure assesses the number of infants born at 22 to 29 weeks of gestation who were screened for retinopathy of prematurity (ROP) in accordance with the AAP 2006 screening recommendations. Specifically, AAP notes that ROP is a progressive disorder of the developing retina of low birthweight preterm infants that can lead to blindness in a small but significant percentage of affected infants. Effective prevention requires that at-risk infants receive carefully timed retinal examinations by an experienced ophthalmologist and that all pediatricians who care for at-risk preterm infants should be aware of the proper timing for these exams.[62]

The Steering Committee acknowledged that the denominator population would be relatively small for this measure, because infants discharged before reaching the recommended age for screening would not be included in the denominator. However, the majority of the Committee members agreed that this is nonetheless an important measure for which there are established guidelines and that failure to adhere to those guidelines can have devastating, lifelong consequences. Moreover, the Committee agreed that there is room for improvement in this aspect of care and that endorsement would raise the level of awareness and ultimately promote a higher quality of care.

0489 **Timely surfactant administration to premature neonates**

(Vermont Oxford Network) *PN-031-07*

This facility-level process of care standard measures the number of infants born at 22 to 29 weeks of gestation who were treated with surfactant at any time and received it within two hours of birth. Meta-analyses of randomized controlled trials have demonstrated that surfactant replacement, given as either prophylaxis or rescue treatment to infants of less than 30 weeks of gestation with surfactant deficiency, reduces mortality, the incidence and severity of respiratory distress syndrome, air leaks, and the combined outcome of bronchopulmonary dysplasia and death, compared to infants who receive placebo or rescue surfactant.[63,64] Even though early rescue surfactant administration (within two hours of birth) reduces the frequency of adverse respiratory outcomes compared with

later administration of rescue surfactant,[65] delayed surfactant treatment occurs frequently, and the proportion of infants treated within two hours of birth varies markedly among hospitals.[66] In 2006, only 76 percent of infants born at 22 to 29 weeks of gestation reported to the Vermont Oxford Network by 632 participating hospitals were treated with surfactant, and 14 percent of those treated received the first dose of surfactant after two hours of birth.[67]

The Steering Committee unanimously agreed that this important measure has a strong evidence base and is consistent with current guidelines. The Committee debated, however, whether the measure might dissuade hospitals from attempting potentially beneficial CPAP (continuous positive airway pressure) trials. Infants receiving a trial of CPAP, if ultimately treated with surfactant, typically receive their first dose later than those infants who are not tried on CPAP, and would thus likely not be included in the measure's numerator. Because early CPAP has not been well studied and what results are available are not conclusive, the Steering Committee did not wish to discourage hospitals from studying this potentially beneficial intervention. Thus, the Committee agreed that if endorsed, the measure should be stratified according to whether the infant received a trial of CPAP. The Steering Committee also noted that because the measure only considers those infants who are actually treated with surfactant, those for whom CPAP was successful would be excluded. Another concern was the potential, given the inconclusiveness of CPAP trials to date, that the measure will not reflect the optimal standard of care within several years, should CPAP prove highly beneficial. However, because NQF policy dictates routine measure maintenance every three years—and earlier should new evidence come to light—the Committee was comfortable with and unanimously recommended endorsement of this measure, with the condition that it be stratified to reflect CPAP trials.

0145 **Neonatal immunization**

(Child Health Corporation of America) *PN-032-07*

This facility-level process measure was endorsed in 2003 and was reevaluated within this project as a part of NQF's routine measure maintenance activities. Even though no information was identified to demonstrate that the use of this measure since its initial endorsement in 2003 has had a significant impact on performance or outcomes, the Steering Committee agreed that the measure addresses an important perinatal health issue for a particularly vulnerable patient population—NICU patients who have been hospitalized for more than 60 days. Moreover, the measure is consistent with AAP's current immunization guidelines and effectively meets NQF's four evaluative criteria. Thus, the Steering Committee unanimously recommended this measure for continued endorsement.

Endorsement Decision Deferred

PN-014-07 Newborn bilirubin screening prior to discharge
(Providence Health and Services/NPIC)

This facility-level process standard measures the percentage of normal infants born at ≥35 weeks of gestation who have a serum or transcutaneous bilirubin obtained before discharge. The measure assesses the prevention of one of NQF's serious reportable events (4E)—Death or Serious Disability (Kernicterus) Associated with Failure to Identify and Treat Hyperbilirubinemia in Neonates. Acute bilirubin encephalopathy or acute kernicterus resulting from newborn jaundice is again being reported in hospitals around the country. In 2001, The Joint Commission issued a sentinel event alert[68] and AAP released a statement bringing the issue of kernicterus to the attention of the pediatric community.[69] The actual incidence of acute kernicterus is unknown, because of limited clinical experience with the uncommon event and the lack of a national reporting policy. However, surrogate or proxy measures, such as readmission of healthy term and near-term newborns for intensive phototherapy for extreme hyperbilirubinemia (TSB>25), provide reasonable alternative measures of jaundice-related adverse outcomes.[70]

Studies have demonstrated constant under-detection of hyperbilirubinemia if visual recognition is the only method used for identification of jaundice,[71] and visual recognition is particularly inaccurate in babies with darker skin tones and in documenting the cephalo-caudal progression of jaundice in infants.[72] A study reported by Keren and Bhutani concludes that predischarge bilirubin expressed as a risk zone on an hour-specific bilirubin nomogram is more accurate and generates wider risk stratification than a clinical risk factor score.[73] AAP clinician practice guidelines state that before discharge, every newborn should be assessed for the risk of developing severe hyperbilirubinemia and that all nurseries should establish protocols for assessing this risk through two clinical options used individually or in combination—predischarge measurement of the bilirubin level using TSB or TcB and/or assessment of clinical risk factors. Whether or not either or both options are used, appropriate follow-up after discharge is essential.

The Steering Committee agreed that this measure addresses a potentially profoundly devastating perinatal health issue, which is largely avoidable when existing guidelines are observed. The Steering Committee largely agreed that, despite the existing controversy on the cost-effectiveness of a universal screening program, the fiscal, societal, and emotional costs resulting from this preventable disease are incalculable and justify the endorsement of this measure.

The CSAC supported the suggestion made by several NQF member organizations to defer final decision on the measure for routine bilirubin testing for all newborns to await the results of an ongoing evidence review and reconsideration by the U.S. Preventive Services Task Force that is expected in the near future. The Steering Committee, however, argued that the current guidelines by other national bodies, such as AAP, strongly support routine testing. The Steering Committee also expressed some urgency regarding the issue, given the

perceived safety considerations. Ultimately, the majority of the CSAC members continued to support the deferral of the decision until the evidence report is available.

Measures Not Endorsed

PN-004-07 **NEONATAL MORTALITY** (AHRQ)

The Steering Committee agreed that the measure addresses a highly important perinatal outcome and appreciated that it employs a hierarchical risk adjustment, which Committee members believed to be superior to the risk model contained in the currently endorsed Neonatal Mortality measure (PN-026-07). However, there was consensus that attribution would be difficult without a fully integrated system, because patients may be readmitted to a different hospital. Moreover, the measure excludes transfers-out—who are likely to be the sickest infants—and does not include transfers-in after the second day of life. The Committee noted that this would often result in the sickest babies not being included in either the transferring or receiving facility's denominator population. Committee members suggested that this could actually conceal poor care, because hospitals could transfer dying infants who are under two days of age without attribution. The Steering Committee also speculated that endorsement of the measure might induce inappropriate behaviors such as "cherry-picking" patients—conceivably even prenatally. Finally, because transfers-out are excluded, Level I and II NICUs would appear to be providing better care than Level III NICUs. The Committee feared this might be misleading to consumers when choosing a facility to care for very ill neonates. The Steering Committee members ultimately agreed that the measure does not truly reflect the quality of care provided and unanimously recommended against its endorsement.

PN-026-07 **RISK ADJUSTED INPATIENT NEONATAL MORTALITY** (The Joint Commission)

This measure was endorsed in 2003 and was reevaluated as a part of NQF's routine measure maintenance activities. The Steering Committee noted that, although the measure addresses a highly important perinatal outcome, it is both a relatively infrequent occurrence (i.e., 0.4 percent), and there has been no change in this rate since the measure was endorsed and implemented in 2003. Unlike AHRQ's Neonatal Mortality measure discussed above (PN-004-07), this measure includes transfers-in until day 28 of life. However, because transfers-out are excluded, Level I and II NICUs would again misleadingly appear to be providing better care than Level III NICUs. Additionally, the hierarchical risk model employed by the competing AHRQ measure was agreed to be technically superior to this measure's model. Finally, the Steering Committee remarked that NICU quality does not generally correlate well with mortality, because more than 95 percent of all NICU infants survive. Rather, morbidity is a better reflection of NICU care. Thus, the Committee agreed that this standard is not an adequate indicator of the quality of care provided and unanimously and strongly recommended that endorsement not be continued.

PN-005-07 **PREVENTION OF PATHOLOGIC HYPERBILIRUBINEMIA IN TERM AND NEAR TERM NEONATES** (HCA/St. Marks Perinatal Center)

The Steering Committee acknowledged that this measure addresses an important and preventable perinatal outcome. However, the Committee agreed that attribution would be difficult without a fully integrated system, because patients may be readmitted to a different hospital. Additionally, the Committee noted that the measure would hold hospitals responsible for what would likely be the result of improper follow-up in the outpatient setting. Although the Committee appreciated the improved performance resulting from the implementation of this measure within the HCA system, it was noted that because a universal bilirubin screening measure was also implemented, it was unclear whether this measure contributed significantly to observed improvements. Ultimately, the Steering Committee unanimously recommended against the endorsement of this measure.

PN-008-07 **APPROPRIATE MANAGEMENT OF GROUP B STREPTOCOCCAL (GBS) COLONIZATION IN LABOR** (HCA/St. Marks Perinatal Center)

PN-012-07 **INTRAPARTUM GROUP B STREPTOCOCCUS PROPHYLAXIS** (Massachusetts General Hospital)

PN-015-07 **GROUP B STREPTOCOCCUS ANTEPARTUM SCREENING AND INTRAPARTUM TREATMENT** (CWISH/Sharp Mary Birch Hospital)

Although the Steering Committee acknowledged that these measures address a very important perinatal health issue, it was noted that group B streptococcus (GBS) guidelines are already consistently being followed and that the Healthy People 2010 goals in this area have already been met. Moreover, there is an average risk of 10 to 20 maternal deaths per year resulting from anaphylaxis from GBS prophylaxis, and the Steering Committee noted that as GBS rates have declined, the incidence of penicillin-resistant sepsis has increased. Committee members thus agreed that because currently there is little room for improvement in this aspect of perinatal care and because limited resources must be directed to areas in which the greatest impact can be expected, none of the GBS measures submitted for endorsement can be recommended. However, the Committee wished to clarify that this decision is a reflection of the success of GBS guidelines and is not intended to redirect focus away from that area. The Steering Committee urged continued adherence to the existing guidelines.

PN-009-07 **ADMINISTRATION OF CORTICOSTEROIDS FOR FETAL MATURATION IN WOMEN AT RISK OF PRETERM DELIVERY** (HCA/St. Marks Perinatal Center)

PN-023-07 **USE OF CORTICOSTEROIDS FOR FETAL LUNG MATURATION IN INFANTS UNDER 1500G** (California Maternal Quality Care Collaborative)

Of the three antenatal steroid measures submitted for consideration, the Steering Committee generally preferred the denominator definition of PN-016-07 (Appropriate Use of Antenatal Steroids, because it considers only those women who actually delivered preterm infants. Conversely, the PN-009-07 denominator includes all women "with a diagnosis of labor and at risk of preterm delivery." The Steering Committee believed that this definition does not effectively target the population of greatest interest (i.e., delivered preterm neonates).

Although the California Maternal Care Quality Collaborative measure (PN-023-07) employs a combined weight- and dates-based definition, the majority of the Steering Committee members agreed that this would both complicate data collection and increase burden. Thus, despite the similarities among these three measures, the majority of the Steering Committee members agreed that PN-016-07 is "cleaner" and would better capture the population of interest. PN-016-07 was recommended for endorsement.

PN-017-07 DISRUPTION OF AN OBSTETRICAL WOUND REQUIRING REPAIR (NPIC/CWISH)

The Steering Committee noted that there is a very low incidence of both abdominal and perineal wound dehiscence (i.e., 0 percent to .02 percent, as reported by CWISH). Moreover, the measure considers wounds requiring repair before discharge, while the breakdown of vaginal repairs are generally handled in the outpatient setting. As such, the Committee did not believe this measure would be useful as a publicly reported measure.

PN-018-07 PERINATAL DEEP VENOUS THROMBOSIS/ PULMONARY EMBOLISM (NPIC/CWISH)

The Steering Committee acknowledged that the measure addresses an important cause of maternal mortality and that measurement cost and burden would be minimal, given the administrative data source. However, the Committee agreed that the rarity of this outcome (i.e., 0 percent to 1 percent incidence per year) would render this measure of little use for comparisons at the individual clinician or facility levels.

PN-028-07 RISK ADJUSTED VAGINAL BIRTH AFTER CESAREAN DELIVERY RATE (The Joint Commission)

This measure was endorsed in 2003 and was reevaluated as a part of NQF's routine measure maintenance activities. Some Steering Committee members agreed that this access measure does provide valuable information for women who desire access to vaginal birth after cesarean (VBAC). However, the majority believed that because this measure does not provide an assessment of either an outcome or adherence to an evidence-based guideline, it is not a true indicator of quality. Because an "ideal" VBAC rate has not been established, and it is unclear whether a higher or lower rate is desirable, results are neither meaningful nor actionable. Moreover, one Committee member noted that patients can easily obtain information on VBAC availability by directly contacting hospitals. Thus the majority of the Steering Committee members agreed that the measure does not meet the NQF criteria of importance or usability and that continued endorsement would be an improper use of limited resources and would do little to improve care or outcomes.

The CSAC initially rejected the Steering Committee recommendation to retire the currently endorsed VBAC measure and requested reconsideration by the Steering Committee of all submitted VBAC measures. The Steering Committee agreed that VBAC is an important issue but noted that the endorsed measure does not adequately differentiate between mothers for whom VBAC is indicated or medically appropriate and those for whom it is not. The Steering Committee noted that The Joint Commission's website describes the

VBAC measure as a "neutral" measure that is not used for public reporting.[iii] The Steering Committee also re-reviewed the other VBAC measures that were submitted to NQF and concluded that they are not appropriate for public reporting. Ultimately, the CSAC supported the Steering Committee's recommendation to retire the VBAC measure. The CSAC wanted to clearly signal to the measure development community that a new VBAC measure is needed and that NQF would be prepared to review new VBAC measures whenever they become available.

PN-020-07 **VBAC AVAILABILITY** (California Maternal Quality Care Collaborative)

Although some Committee members believed that endorsement of this measure would encourage facilities to provide access to VBAC consistent with ACOG guidelines (i.e., to counsel eligible women and offer VBAC with immediate access to emergency care), the majority of the Committee members agreed that this measure might paradoxically drive ill-equipped facilities to offer the procedure, ultimately placing patients in jeopardy. Moreover, although the measure defines access as a specific VBAC rate (i.e., 5 percent or greater), the Steering Committee noted that there is no consensus on what the "ideal" VBAC rate is. One Committee member pointed out that the measuring of facilities' VBAC rates has been occurring since 2003 without notable impact. Given these reservations, the majority of the Committee members recommended against endorsing this measure.

Although the Committee was not in favor of either of the VBAC measures considered in this project, and neither of the VBAC measures was recommended for use in public reporting, Committee members expressed grave concern about diminishing VBAC availability. VBAC rates have been declining since the mid-1990s, and access to the procedure has become problematic, because fewer facilities and clinicians are offering the procedure. To address this concern, and its belief that this is an extremely important quality issue that must be addressed, the Committee has developed several germane research and development recommendations that are presented in this report.

PN-024-07 **OBSTETRICAL ANESTHESIA COMPLICATIONS RATE** (NPIC/CWISH)

The Committee agreed that this measure addresses an important aspect of perinatal care.

Moreover, measure use and field testing have demonstrated that the data collection strategy can be implemented and that cost and burden would be minimal, because the measure employs an administrative data source. Ultimately, however, given the relatively low incidence of obstetrical anesthesia complications, the Steering Committee could not justify a recommendation in favor of this measure or an investment of resources in it.

[iii] "A neutral measure is one where improvement could be noted by either an increase or decrease in the rate. Thus, relative improvement can only be assessed by the provider and therefore this measure is intended for internal quality improvement at the individual hospital in their activities to probe and understand hospital processes and practices." See page 10 at www.jointcommission.org/NR/rdonlyres/4E452BCB-C4C1-415A-9792-ED676F19567C/0/QC_UserGuide_HAP_General_Public_73108.pdf.

PN-027-07 **RISK ADJUSTED THIRD OR FOURTH DEGREE LACERATION** (The Joint Commission)

This measure was endorsed in 2003 and was reevaluated as a part of NQF's routine measure maintenance activities. The Steering Committee noted that for 3rd and 4th degree lacerations, the patient's outcome depends on the quality of the repair, which is not addressed by the measure. Moreover, only three of the nine risk factors identified in the measure are modifiable—induction, use of forceps, and vacuum extraction. The Committee agreed that the major controllable risk factors for third- and fourth-degree laceration are operative delivery, which is declining, and routine episiotomy. The Steering Committee concurred that because episiotomy is a "targetable" antecedent to third- and fourth-degree lacerations that is amenable to intervention, PN-013-07 (Incidence of Episiotomy) would provide a more accurate reflection of quality than PN-027-07.

The Steering Committee also noted that the data for this measure are notoriously unreliable. For example, many providers have been encouraged not to code the "partial 3rd degree laceration" as a 3rd degree tear (i.e., providers "code down"). Finally, the Steering Committee observed that there has been no appreciable change in reported rates of significant perineal lacerations (3 percent to 5 percent) since the measure was endorsed and implemented in 2003, supporting the Committee's premise that the measure does not effectively drive performance improvement. As such, the majority of the Committee members agreed that this measure does not effectively meet NQF's evaluative criteria for importance, scientific acceptability (i.e., reliability with "coding down"), or usability, and strongly recommended that endorsement be withdrawn.

PN-033-07 **CESAREAN DELIVERY RATE** (Healthy People 2010)

This measure was endorsed in 2003 and was evaluated as a part of NQF's routine measure maintenance activities. The Committee agreed that the measure addresses an important and actionable perinatal health issue for which there is substantial unfounded provider variation. And although there are no existing guidelines on what an "appropriate" C-section rate is, the currently high rates are thought to primarily reflect provider, rather than patient, preferences. However, the Steering Committee agreed that the CMQCC measure (Cesarean Rate for Low-Risk First Birth Women, PN-010-07) has improved greatly on this standard. Specifically, the Committee appreciated that the CMQCC measure targets nulliparous patients, because the remainder of their reproductive life can be affected by this decision, and that the measure where implemented has been associated with decreased cesarean rates. Ultimately, the majority of the Committee members expressed a strong preference for PN-010-07 and recommended that it replace this measure.

Recommendations

NQF offers the following recommendations to accompany the measures:

- **Group B Streptococcus (GBS) Prophylaxis and Treatment.** Although none of the GBS measures submitted for endorsement consideration were ultimately recommended, there should be continued adherence to the existing guidelines that have so effectively contributed to the marked decline in the pathogen's transmission and related complications. Monitoring to ensure the use of the appropriate antibiotic (e.g., penicillin and not ampicillin) and continued tracking and documentation of pathogen resistance are needed. In addition, there should be tracking of maternal anaphylaxis resulting from antibiotics administered for GBS prophylaxis and treatment.

- **Corticosteroids for Fetal Maturation in Women at Risk of Preterm Delivery.** Further research is needed regarding the safety and efficacy of multiple courses of antenatal steroids and the administration of antenatal steroids to mothers 32 to 34 weeks pregnant with premature rupture of membranes. Given the current state of research, ACOG recommendations appropriately offer little guidance with regard to the latter clinical scenario, potentially encouraging the underuse of a very effective intervention.

- **VBAC.** Although neither of the VBAC measures considered within this set of measures was recommended for endorsement, it is important to emphasize concerns about the diminishing VBAC availability and to focus on this as an extremely important issue of access that must be addressed. It will be important to develop future measures related to information, access, and choice, and multiple and/or composite VBAC-associated measures would be appropriate to address the scale and complexity of the issue. The following factors should be considered in future measure development:

  - women's needs for high-quality information, counseling, and shared decision-making, in the context of access to choice of care options, and
  - the fact that measures looking at the number of VBACs as a percentage of total births or as a percentage of all repeat cesareans are meaningless, because they do not address the underlying and central issue of access.

  In addition, a measure of whether a facility meets ACOG VBAC guidelines should include both the ability to offer the service to eligible women and the ability to provide immediate emergency services for failed VBAC trials.

- **Hyperbilirubinemia Education.** The most effective means of both avoiding hyperbilirubinemia and minimizing its deleterious consequences is through proper parental education. Developers should focus future efforts on the creation of an indicator assessing this aspect of care. Appropriate education materials would include a clear message about risk, would encourage parents to ask about bilirubin testing, would emphasize the importance of early follow-up, and would provide appropriate information on breastfeeding. Existing PICK (Parents of Infants and Children with Kernicterus)/CDC education materials effectively address these topics through the use of posters, a workbook mothers, and a video. These materials have been tested in focus groups and surveyed throughout the United States, and they have been endorsed by the Department of Health and Human Services. A measure assessing the implementation and use of the PICK/CDC or similar materials would effectively fill this current measurement gap.

- **Maternal Risk Assessment.** Efforts are needed to address the absence of measures that provide a direct assessment of maternal risk factors known to be associated with adverse perinatal outcomes. Measures should be developed in the areas of maternal hypertension, preeclampsia, eclampsia, and obesity.
- **Disparities in Perinatal Care.** Although there is a lack of available measures focusing on underserved or vulnerable populations, the routine collection of data on race, ethnicity, and language for the recommended measures would allow for disparities-sensitive stratification of results. Developers should focus future efforts on the creation of measures that assess quality and disparities specifically for at-risk populations.
- **Normal Birth Measure.** Interventions such as induction of labor and episiotomy are frequently employed in the largely healthy maternal population. The development of a risk-adjusted "normal birth" measure would benefit women who wish to avoid such procedures when possible.
- **Informed Decisionmaking.** Measures of the quality of information provided to childbearing women and of the quality of informed consent would be valuable additions to a national measure set. Developers are urged to focus future efforts and resources on these important topics.
- **Smoking Cessation.** The development of measures of maternal tobacco use are needed. Developers should focus future efforts on creating measures that gauge smoking cessation rather than counseling or referral.
- **Patient Experience.** The patient experience is an important NQF measure class, but no patient experience measures were available for consideration. The CAHPS®, surveys currently in use have many strengths, but they are limited in their application to childbearing women. A "consumer assessment" instrument in the CAHPS family should be tailored specifically for this population. Population-specific considerations include accommodating the range of maternity care providers and birth settings, the range of approaches to labor pain relief, and the range of routes of medication.
- **Transitions of Care.** Obstetric admissions involve transfers from outpatient to inpatient care settings (and vice versa), and such "hand-offs" often provide significant opportunities for medical errors to occur. Developers should consider the creation of perinatal transitions of care measures, such as a "prenatal chart present at labor admission" measure.
- **Value Added.** Facilities invest a great deal of time and resources in performance measurement. Given that some of the measures endorsed in this set address relatively uncommon occurrences, it will be important to assess the value they add for patients, providers, and payers. Research is needed to determine whether the collection and dissemination of these quality measures result in measurable improvement in perinatal care and outcomes.

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Appendix A
Specifications of the National Voluntary Consensus Standards for Perinatal Care 2008

THE FOLLOWING TABLE PRESENTS the detailed specifications for the National Quality Forum (NQF)-endorsed® *National Voluntary Consensus Standards for Perinatal Care 2008.* All information presented has been derived directly from measure sources/developers without modification or alteration (except when the measure developer agreed to such modification during the NQF Consensus Development Process) and is current as of October 20, 2008. All NQF-endorsed voluntary consensus standards are open source, meaning they are fully accessible and disclosed.

MEASURE TITLE	MEASURE NUMBERS	IP OWNER(S)[a]	NUMERATOR	DENOMINATOR	EXCLUSIONS	DATA SOURCE
Elective delivery prior to 39 completed weeks gestation*	Measure ID #: 0469 Review #: PN-007-07	HCA/ St. Marks Perinatal Center	Babies from the denominator electively delivered prior to 39 completed weeks gestation.	All singletons delivered at ≥37 completed weeks gestation.	Post-dates (ICD-9 code 645), IUGR (656.5), oligohydramnios (658.0), hypertension (642), diabetes (648.0), maternal cardiac disease (648.8), previous stillbirth (648.5), placental abruption (648.6), placenta previa (641), unspecifed antenatal hemorrhage (646.2), maternal renal disease (646.7), acute fatty liver or pregnancy (651), multiple gestation (652), malpresentation (656.1), isoimmunization (656.2), maternal coagulopathy (656.4), fetal demise (657), hydramnios (658.1), and ruptured membranes (649.3), V27.1.	Medical records.

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* Time-limited endorsement.

[a] IP owner—intellectual property owner and copyright holder. ALL RIGHTS RESERVED. For the most current specifications and supporting information, please refer to the IP owner:
AHRQ - Agency for Healthcare Research and Quality (www.ahrq.gov)
Asian Liver Center at Stanford (http://liver.stanford.edu)
CMQCC - California Maternal Quality Care Collaborative (www.cmqcc.org)
CDC - Centers for Disease Control and Prevention (www.cdc.gov)
Child Health Corporation of America (www.chca.com)
Christiana Care Health Services (www.christianacare.org)
CWISH - Council of Women and Infants Specialty Hospitals (www.cwish.org)
HCA - Hospital Corporation of America, Inc./St. Marks Perinatal Center (www.hcahealthcare.com)
Massachusetts General Hospital (www.massgeneral.org)
NPIC - National Perinatal Information Center (www.npic.org)
Providence St. Vincent Medical Center (www.providence.org)
Vermont Oxford Network (www.vtoxford.org)

MEASURE TITLE	MEASURE NUMBERS	IP OWNER(S)[a]	NUMERATOR	DENOMINATOR	EXCLUSIONS	DATA SOURCE
Incidence of episiotomy*	Measure ID #: 0470 Review #: PN-013-07	Christiana Care Health Services NPIC	Number of patients from the denominator with episiotomy procedures (CPT code: 59410 or ICD-9 codes 72.1, 72.21, 72.31, 72.71; 73.6 code with 75.6) performed.	Number of vaginal deliveries (CPT 59410 or by DRG).	Vaginal deliveries complicated by a shoulder dystocia (ICD-9 660.41 or 660.42).	Claims, medical records, electronic health records.
Cesarean rate for low-risk first birth women	Measure ID #: 0471 Review #: PN-010-07	California Maternal Quality Care Collaborative	Proportion of patients from the denominator that had a cesarean birth.	Livebirths at or beyond 37.0 weeks gestation that are having their first delivery and are singleton (no twins or beyond) and vertex presentation (no breech or transverse positions).	Patients with abnormal presentation, preterm, fetal death, multiple gestation diagnosis codes, or breech procedure codes.	Claims data and vital records (birth certificate).
Prophylactic antibiotic in C-section	Measure ID #: 0472 Review #: PN-011-07	Massachusetts General Hospital	Number of patients who received prophylactic antibiotics within one hour prior to surgical incision or at the time of delivery.	All patients undergoing cesarean section without evidence of prior infection or already receiving prophylactic antibiotics for other reasons.	Patients who had a principal ICD-9 diagnosis code suggestive of preoperative infectious disease (as defined in Appendix A, Table 5.09 of the Specification Manual for National Hospital Quality Measures, Version 2.2, and future updates). Patients who were receiving antibiotics within 24 hours prior to surgery, except that prophylaxis with penicillin or ampicillin for group B streptococcus (GBS) is not a reason for exclusion. Patients with physician/ advanced practice nurse/physician assistant/certified nurse midwife documented infection or prophylaxis for infection, except that prophylaxis for GBS is not a reason for exclusion. Patients who undergo other surgeries within 3 days before or after the cesarean section.	Administrative, medical records, clinician survey, paper medical record, and electronic health record.

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MEASURE TITLE	MEASURE NUMBERS	IP OWNER(S)[a]	NUMERATOR	DENOMINATOR	EXCLUSIONS	DATA SOURCE
Appropriate DVT prophylaxis in women undergoing cesarean delivery*	Measure ID #: 0473 Review #: PN-006-07	HCA/ St. Marks Perinatal Center	Patients from the denominator who receive either fractionated or unfractionated heparin or pneumatic compression devices prior to surgery.	All women undergoing cesarean delivery.	None.	Medical records.
Birth trauma rate measures (harmonized)*	Measure ID #: 0474 Review #: PN-002/019-07	AHRQ NPIC	Discharges from the denominator with one of the following birth outcomes: 1. ICD-9-CM code 7670: subdural and cerebral hemorrhage due to trauma, intrapartum anoxia, or hypoxia 2. 76711: epicranial subaponeurotic hemorrhage (massive) 3. 7673: injuries to skeleton (excludes clavicle) 4. 7674: injury to spine and spinal cord 5. 7675: facial nerve injury 6. 7677: other cranial and peripheral nerve injuries 7. 7678: other specified birth trauma 8. 767.8: other specified birth trauma, eye damage, hematoma of liver, testes, vulva, rupture of liver, spleen, scalpel wound, traumatic glaucoma.	All neonates within a hospital. A neonate is any newborn aged 0 to 28 days (inclusive) at discharge with: 1. An ICD-9-CM code for in-hospital liveborn birth; *OR* 2. An admission type of newborn, age in days at admission equal to 0, and no code for an out-of-hospital birth; *OR* 3. Any DRG in MDC 15 (if age in days is missing).	Infants with a birth weight of less than 2000g (ICD-9-CM codes 765.00-07, 765.11-17). Infants with any diagnosis code of osteogenesis imperfecta (756.51). Infants with injury to the brachial plexus, palsy or paralysis, Erb's palsy (767.6).	Claims/discharge abstract data.

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MEASURE TITLE	MEASURE NUMBERS	IP OWNER(S)[a]	NUMERATOR	DENOMINATOR	EXCLUSIONS	DATA SOURCE
Hepatitis B vaccine administration to all newborns prior to discharge*	Measure ID #: 0475 Review #: PN-001-07	CDC	Number of newborns from the denominator administered hepatitis B vaccine (CPT for hepatitis B vaccine - 90744, CPT for immunization administration 90471, diagnosis code V05.3 for hepatitis B vaccination) prior to discharge.	Number of live newborns discharged from the hospital.	Parental refusal.	Claims, medical records, clinical database, pharmacy data, and electronic health record data.
Appropriate use of antenatal steroids*	Measure ID #: 0476 Review #: PN-016-07	Providence St. Vincent Medical Center CWISH	Number of mothers from the denominator receiving receiving antenatal steroids (corticosteroids administered IM) during pregnancy at any time prior to delivery.	Total number of mothers who delivered preterm infants (24-32 weeks with preterm premature rupture of membranes or 24-34 weeks with intact membranes).	None.	Medical record, clinical database, electronic health record.
Infants under 1500g delivered at appropriate site	Measure ID #: 0477 Review #: PN-022-07	California Maternal Quality Care Collaborative	Liveborn infants from the denominator with birthweight <1500g at the given birth hospital.	All live births over 24 weeks gestation at the given birth hospital. **Is this hospital a Level III* or equivalent neonatal intensive care unit as defined by AAP**? Yes ☐ No ☐** *Level III subspecialty NICUs have the personnel and equipment to care for infants <1500 grams. Hospitals that do not have Level III NICUs should have low rates for this measure, indicating appropriate transfer of a mother at risk of preterm delivery to a facility capable of providing Level III care for a very low birthweight infant. **American Academy of Pediatrics guidelines for Levels of Care: http://aappolicy.aappublications.org/cgi/reprint/pediatrics;114/5/1341.pdf.	None.	Birth records.

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MEASURE TITLE	MEASURE NUMBERS	IP OWNER(S)[a]	NUMERATOR	DENOMINATOR	EXCLUSIONS	DATA SOURCE
Nosocomial blood stream infections in neonates*	Measure ID #: 0478 Review #: PN-003-07	AHRQ	Any diagnosis code for: ▌ Staphylococcal septicemia, unspecified [038.10] ▌ *Staphylococcus aureus* septicemia [038.11] ▌ Other staphylococcal septicemia [038.19] ▌ Gram-negative organism NOS [038.40] ▌ Septicemia due to other gram-negative organisms, *Escherichia coli* [038.42] ▌ Septicemia due to other gram-negative organisms, *Pseudomonas* [038.43] ▌ Septicemia due to other gram-negative organisms, *Serratia* [038.44] ▌ Septicemia due to other gram-negative organisms, other [038.49] ▌ Disseminated candidiasis/Systemic candidiasis [112.5]. *OR* Patients with one of the following diagnosis codes: ▌ Septicemia [sepsis] of newborn [771.81] *OR* ▌ Bacteremia of newborn [771.83] *OR* ▌ Bacteremia [790.7] AND one of the following diagnosis codes: ▌ Streptococcus group D *(Enterococcus)* [041.04] ▌ Staphylococcus, unspecified [041.10] ▌ *Staphylococcus aureus* [041.11] ▌ Other staphylococcus [041.19] ▌ Friedländer's bacillus *(Klebsiella pneumoniae)* [041.3] ▌ *Escherichia coli* [041.4] ▌ *Pseudomonas* [041.7].	All inborn and outborn infants (admitted at 0-28 days) with a birthweight between 500 and 1499g OR a gestational age between 24 and 30 weeks AND all inborn and outborn infants with a birthweight greater than or equal to 1500g, if the infant experienced death, major surgery, mechanical ventiliation or transfer in or out from/to an acute care facility. Inborn refers to neonates born within that institution, outborn refers to neonates born elsewhere but transferred within the first 2 days of life.	Patients with a principal diagnosis of sepsis or bacterial infection. Patients with a length of stay of less than 2 days.	Claims/discharge abstract data.

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MEASURE TITLE	MEASURE NUMBERS	IP OWNER(S)[a]	NUMERATOR	DENOMINATOR	EXCLUSIONS	DATA SOURCE
Birth dose of hepatitis B vaccine and hepatitis immune globulin for newborns of mothers with chronic hepatitis B*	Measure ID #: 0479 Review #: PN-025-07	Asian Liver Center at Stanford University	Number of newborns from the denominator who receive birth doses of HBV vaccine and HBIG within 12 hours of delivery.	Number of newborns delivered from mothers who tested positive for HBsAg during pregnancy.	Stillbirths.	Medical records, clinical database, laboratory data, and electronic health record data.
Exclusive breast-feeding at hospital discharge	Measure ID #: 0480 Review #: PN-021-07	California Maternal Quality Care Collaborative	Proportion of the denominator that were fed by "breast only" since birth.	Livebirths not discharged from the NICU who had newborn genetic screening performed.	Infants in the NICU at time of newborn screen and infants who received TPN or other nutrition supplements.	Newborn screening data.
PAIRED MEASURES:						
First temperature within one hour of admission to NICU ***AND*** **First NICU temperature <36°C**	Measure ID #: 0481 Review #: PN-029-07A Measure ID #: 0482 Review #: PN-029-07B	Vermont Oxford Network	Patients from the denominator with a first temperature taken within 1 hour of NICU admission. Patients from the denominator whose first temperature was below 36°C.	All NICU admissions with a birth weight of 501-1500g. All NICU admissions with a birth weight of 501-1500g whose first temperature was measured within one hour of admission to the NICU.	Outborn infants admitted more than 28 days after birth. Outborn infants that had been home prior to admission. Infants without temperature taken within 1 hour of NICU admission.	Medical records, registries, the Vermont Oxford Network database (when applicable), and the eNICQ data collection instrument.

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MEASURE TITLE	MEASURE NUMBERS	IP OWNER(S)[a]	NUMERATOR	DENOMINATOR	EXCLUSIONS	DATA SOURCE
Retinopathy of prematurity screening	Measure ID #: 0483 Review #: PN-030-07	Vermont Oxford Network	Number of infants from the denominator receiving a retinal exam for ROP.	Number of infants aged 22 to 29 weeks gestation hospitalized at the postnatal age at which a retinal exam is recommended by the American Academy of Pediatrics.	Outborn infants admitted more than 28 days after birth. Outborn infants that had been home prior to admission.	Medical records, registries, the Vermont Oxford Network database (when applicable), and the eNICQ data collection instrument.
Timely surfactant administration to premature neonates	Measure ID #: 0489 Review #: PN-031-07	Vermont Oxford Network	Patients from the denominator treated with surfactant within 2 hours of birth.	Number of infants born at 22 to 29 weeks gestation treated with surfactant at any time.	Outborn infants admitted more than 28 days after birth. Outborn infants that had been home prior to admission.	Medical records, registries, and the Vermont Oxford Network database (when applicable).
Neonatal immunization[b]	Measure ID #: 0145 Review #: PN-032-07	Child Health Corporation of America	Patients from the denominator receiving the following immunizations according to current AAP guidelines: ▮ DtaP ▮ HepB ▮ IPV ▮ Hib ▮ PCV	Neonates with a length of stay greater than 60 days.	Documented parent refusal and mortalities. The developer recommends that the measure be suspended when there are vaccine shortages rather than including vaccine unavailability as an exclusion.	Retrospective review of both administrative and medical records data. Manual collection is required for parent refusal and cross-reference to administrative data.

[b] Previously endorsed measure; evaluated as part of NQF's ongoing measure maintenance activities.

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