CAPQuaM PQMP Perinatal MEASURE 4 Detailed Measure Specifications

A. Description
Divides low birthweight neonates who are admitted to a Level 2 or higher nursery into five strata based upon their admission temperature and calculates the proportion of infants in each stratum based upon their temperature upon arrival to the Level 2 or higher nursery. All temperatures are analyzed using degrees Celsius and reported to one decimal place.

B. Eligible Population

Numerator: Live-born neonates with a birthweight of less than 2500 grams (as identified by ICD-9-CM Principal or Other Diagnosis Codes in Table 1) using the first temperature taken in Level 2 or higher nursery.

The numerator has 5 comprehensive and mutually exclusive strata. Each is determined by the number of children whose qualifying temperature (usually the first temperature after arrival to the Level 2 or higher nursery) falls within the criteria for that stratum.

Stratum 1 “Cold”:
All neonates with temperatures less than or equal to 34.5 degrees Celsius.

Stratum 2 “Very cool”
All neonates with temperatures greater than 34.5 degrees Celsius and less than or equal to 35.5 degrees Celsius;

Stratum 3 “Cool”:
All neonates with temperatures greater than 35.5 degrees Celsius and less than or equal to 36.5 degrees Celsius;

Stratum 4 “Euthermic”:
All neonates with temperatures greater than 36.5 degrees Celsius and less than or equal to 37.5 degrees Celsius;

Stratum 5: “Overly warm”:
All neonates with temperatures greater than 37.5 degrees Celsius.

Denominator: Live-born neonates with birthweight of less than 2500 grams (as identified from either the medical record or by ICD-9-CM Principal or Other Diagnosis Codes in Table 1) and who were admitted to a level 2 or higher nursery within 24 hours of birth. Exclusions are noted below.

Table 1. Included Populations:ICD-9-CM Principal or Other Diagnosis Code Low Birthweight Diagnosis Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>76400</td>
<td>LIGHT-FOR-DATES WTNOS</td>
</tr>
<tr>
<td>76401</td>
<td>LIGHT-FOR-DATES &lt;500G</td>
</tr>
<tr>
<td>76402</td>
<td>LT-FOR-DATES 500-749G</td>
</tr>
<tr>
<td>76403</td>
<td>LT-FOR-DATES 750-999G</td>
</tr>
<tr>
<td>76404</td>
<td>LT-FOR-DATES 1000-1249G</td>
</tr>
<tr>
<td>76405</td>
<td>LT-FOR-DATES 1250-1499G</td>
</tr>
<tr>
<td>76406</td>
<td>LT-FOR-DATES 1500-1749G</td>
</tr>
<tr>
<td>76407</td>
<td>LT-FOR-DATES 1750-1999G</td>
</tr>
<tr>
<td>76408</td>
<td>LT-FOR-DATES 2000-2499G</td>
</tr>
<tr>
<td>76410</td>
<td>LT-FOR-DATE W/MAL WTNOS</td>
</tr>
<tr>
<td>76411</td>
<td>LT-FOR-DATE W/MAL &lt;500G</td>
</tr>
<tr>
<td>76412</td>
<td>LT-DATE W/MAL 500-749G</td>
</tr>
<tr>
<td>76413</td>
<td>LT-DATE W/MAL 750-999G</td>
</tr>
<tr>
<td>76414</td>
<td>LT-DATE W/MAL 1000-1249G</td>
</tr>
<tr>
<td>76490</td>
<td>FET GROWTH RETARD WTNOS</td>
</tr>
<tr>
<td>76491</td>
<td>FET GROWTH RETARD &lt;500G</td>
</tr>
<tr>
<td>76492</td>
<td>FET GROWTH RET 500-749G</td>
</tr>
<tr>
<td>76493</td>
<td>FET GROWTH RET 750-999G</td>
</tr>
<tr>
<td>76494</td>
<td>FET GRWTH RET 1000-1249G</td>
</tr>
<tr>
<td>76495</td>
<td>FET GRWTH RET 1250-1499G</td>
</tr>
<tr>
<td>76496</td>
<td>FET GRWTH RET 1500-1749G</td>
</tr>
<tr>
<td>76497</td>
<td>FET GRWTH RET 1750-1999G</td>
</tr>
<tr>
<td>76498</td>
<td>FET GRWTH RET 2000-2499G</td>
</tr>
<tr>
<td>76500</td>
<td>EXTREME IMMATUR WTNOS</td>
</tr>
<tr>
<td>76501</td>
<td>EXTREME IMMATUR &lt;500G</td>
</tr>
<tr>
<td>76502</td>
<td>EXTREME IMMATUR 500-749G</td>
</tr>
<tr>
<td>76503</td>
<td>EXTREME IMMATUR 750-999G</td>
</tr>
<tr>
<td>76504</td>
<td>EXTREME IMMAT 1000-1249G</td>
</tr>
</tbody>
</table>
For codes 76400, 76410, 76420, 76490, 76500, birthweights should be verified from the medical record prior to including in measure.

EXCLUSIONS

Neonates who do not survive until the time limit of the measure (15 minutes after arrival to the NICU)

Neonates with Anencephaly ICD-9-CM 740

Neonates not born in hospital/medical care setting

Neonates for whom the hospital provides documentation that at the time of arrival to the NICU and before the temperature was taken the infant both had been identified as meeting written institutional criteria for the initiation of therapeutic hypothermia and such therapy was begun or planned {OPTIONAL EXCLUSION}

Neonates with Comfort care (requires all of the features below):
  Died within 48 hours of birth; AND
  Received no respiratory support after arrival to the Level 2 or higher nursery other than blow by oxygen (i.e., did not receive CPAP, intubation, or CPR after arrival at Level 2 or higher nursery)

C. DATA SOURCES

A. Medical record (paper or electronic), may be utilized to identify:
   i. Date and time of birth
   ii. Date and time of arrival to a Level 2 or higher nursery;
   iii. Date and time of first temperature upon arrival to that nursery;
   iv. Temperature and units of measurement
   v. Race/ethnicity (preferred data source)
   vi. Home zip code Mother’s State and County of Residence and or zip code (preferred data source)
   vii. Born in medical facility or transferred in (preferred data source)
   viii. 5 minute Apgar score
   ix. Birthweight (preferred data source)
   x. Documentation if child met local criteria for hypothermia and time so identified
   xi. Documentation if hypothermia was planned or initiated before temperature taken
   xii. Insurance type (optional data source)

B. Administrative data with billing and diagnosis codes, utilized to identify:
i. ICD-9 codes to identify low birthweight infants and presence of anencephaly
ii. Revenue codes indicating care in Level 2, 3, or 4 nursery (172, 173, 174)
iii. OPTIONAL source for:
   i. Date of birth
   ii. race/ethnicity
   iii. home zip code
   iv. Whether child was inborn or transferred in
   v. Birthweight range
   vi. Insurance type and benefit plan {Preferred data source}

D. CALCULATION

C. “CALCULATION” and Reporting

Step 1: Identify all live-born neonates with a birthweight less than 2500 grams, using the aforementioned codes or recorded birthweights when practical.

Step 2: Identify all of those neonates from Step 1 who were admitted to Level 2 or higher nursery).

Step 3: Record relevant attributes:
   a. Record ICD-9 comorbid diagnoses.
      EXCLUDE those with anencephaly (ICD-9-CM 740xx ).
   b. Record:
      i. Date and time of birth.
      ii. Birthweight.
      iii. 5 minute Apgar score
      iv. Date and time of arrival to Level 2 or higher nursery.
      v. If child was admitted to a Level 2 or higher nursery from regular newborn care
      vi. If child was inborn or transferred to Level 2 or higher nursery from another facility.
   c. If transferred is there documentation that neonate was not born in a medical facility
      EXCLUDE if: child not born in a medical facility

Step 4: Record the following additional data elements for all eligible neonates:
   i. Race
   ii. Ethnicity
   iii. Insurance type (Medicaid, Commercial, Uninsured)
   iv. Benefit category (HMO, PPO, Medicaid Primary Care Management Plan, Fee for service, Other)
   v. Zip Code and/ or State and County or equivalent area of Mother's residence. Record FIPS if available
   vi. Evidence child received comfort care only (when appropriate). EXCLUDE if so.
   vii. Documentation child was eligible for and received therapeutic hypothermia (when appropriate). EXCLUDE if so.
Step 5: Identify and record:

i. Time of first temperature taken in the nursery (ARRIVAL TEMPERATURE)

ii. Value of first temperature taken in the nursery

iii. Units that temperature was recorded in. If in Fahrenheit calculate Celsius as C=(F-32)*5/9

iv. Record infant age at time of ARRIVAL temperature

Step 5: If infant's age is > 75 minutes at the time of the initial temperature record the following as the ALTERNATE temperature:

i. Time of last temperature taken in the unit where the infant was delivered

ii. Value of that temperature

iii. Units that temperature was recorded in. If in Fahrenheit calculate Celsius as C=(F-32)*5/9

iv. Record infant age at time of that temperature

If infant's age at time of ARRIVAL TEMPERATURE is > 75 minutes AND infant was admitted directly to the Level 2 or higher nursery without transport from another institution OR transfer from the normal newborn nursery, report the lower of the ARRIVAL and the ALTERNATE temperature.

Step 6: Identify which numerator stratum to which the reported temperature should be assigned:

The numerator has 5 comprehensive and mutually exclusive strata. Each is determined by the number of children whose reported temperature falls within the criteria for that stratum.

Stratum 1 “Cold”: All neonates with temperatures less than or equal to 34.5 degrees Celsius.

Stratum 2 “Very cool”: All neonates with temperatures greater than 34.5 degrees Celsius and less than or equal to 35.5 degrees Celsius;

Stratum 3 “Cool”: All neonates with temperatures greater than 35.5 degrees Celsius and less than or equal to 36.5 degrees Celsius;

Stratum 4 “Euthermic”: All neonates with temperatures greater than 36.5 degrees Celsius and less than or equal to 37.5 degrees Celsius;

Stratum 5: “Overly warm”: All neonates with temperatures greater than 37.5 degrees Celsius.

Step 8. Calculate the percent of neonates who are in each stratum:

\[
= \frac{\{100\text{*number of children in each stratum}\}}{\{\text{total number of infants eligible for the measure}\}}
\]

Percents should be reported to 2 decimal places.
Minimum sample size for reporting overall nursery rates is N=20; Reporting should be further stratified by the application of stratification variables as described below to both the numerator and the denominator. Reporting strata with denominator samples less than N=15 should not be reported.

**Step 9. (Optional)** Calculate 90% confidence intervals around each reported percentage as

\[ 1.68 \times \sqrt{\frac{\text{proportion in the confidence interval} \times (1 - \text{that percentage})}{\text{the eligible N}}} \]

**Step 10.** Using eligible births and qualified temperatures, repeat steps 8 and 9 and report for each stratification category listed below, using the following data elements:

i. Birthweight (3 birthweight categories: <999 grams; 1000-1499 grams; 1500-2499 grams)

ii. Perform stratifications as indicated herein (report for each stratum where denominator >=15):
   a. Race and ethnicity (Using White non Hispanic, Black non Hispanic, Hispanic, Asian/Pacific Islander, other)
   b. Insurance type (Public/Medicaid, Private/Commercial, None/Other)
   c. Admission source (use 3 categories: inborn, transported, transferred from newborn nursery)

Location of delivery

**APPLY THESE RULES IN ORDER. STOP WHEN CATEGORIZED**

i. Categorize location of delivery as birthing room if:
   1. Location was identified as delivery room on the labor and delivery suite but was not an operating room OR
   2. Location was identified as a birthing room or equivalent OR
   3. Infant was a vaginal delivery other than a multiple gestation AND Operating Room or equivalent (C-section room would be an example of an equivalent to an operating room) is not specified as location.

ii. Otherwise categorize location as OPERATING ROOM if:
   1. Location was identified as an operating room or equivalent, OR
   2. If neonate was delivered by c-section, OR
   3. If infant was a multiple gestation (and location is unspecified) OR
   4. If location is identified as Emergency Department OR other
d. 5 minute Apgar score (Apgar of 5 or less versus 6 or more)
e. Benefit Category (Benefit category (HMO, PPO, Medicaid Primary Care Management Plan, Fee for service, Other)
f. Urban Influence Code(1) or UIC. (2013 urban influence codes available at: http://www.ers.usda.gov/data-products/urban-influence-codes.aspx#.UZUvG2cVoj8. Use mother's place of residence to determine UIC. State and County names can be linked or looked up directly or zip codes can be linked to County indirectly, using the Missouri Census Data Center (http://mcdc.missouri.edu/).
g. Level of Poverty in the County of Residence. The percent of all residents in poverty by county are available from the US Department of Agriculture at http://www.ers.usda.gov/data-products/county-level-data-sets/download-data.aspx Our stratification standards are based on 2011 US population data that we have analyzed with SAS 9.3.

Using Mother’s state and county of residence (or equivalent) or FIPS code, use the variable PCTPOVALL_2011 to categorize into one of 5 Strata:
   i. Lowest Quartile of Poverty if percent in poverty is <=12.5%
   ii. Second Quartile of Poverty if percent in poverty is >12.5% and <=16.5%
   iii. Third Quartile of poverty if percent in poverty is >16.5% and <=20.7%
   iv. First upper quartile (75th-90th) if percent in poverty is >20.7% and <=25.7%
   v. Second upper quartile (>90th percentile) if percent in poverty exceeds 25.7%

iii. Repeat stratifications a-g within birthweight categories (report for all strata for which denominator >=15)