CAPQuaM PQMP Perinatal MEASURE 3

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 a Level II or higher nursery. This is a continuous variable. The parameter of interest is the admission temperature in the NICU. Our standard, assessed in Proposed Measure 2 of the PQMP Inpatient Perinatal Collection #1, is that infants admitted to a Level 2 or higher nursery have this temperature taken within 15 minutes of admission.

This measure requests the reporting of the following:
  i. Descriptors of the Center of the Distribution (for sample size \( \geq 5 \))
     a. Mean
     b. Median (50\(^{th}\) percentile)
     c. 25\(^{th}\) percentile
     d. 75\(^{th}\) percentile
  ii. Descriptors of Dispersion
      a. Interquartile range (for sample size \( \geq 5 \))
      b. Standard Deviation (for sample size \( \geq 10 \))
  iii. Descriptors of the Warm end of the Distribution
      a. 99\(^{th}\) percentile (for sample size \( \geq 33 \))
      b. 95\(^{th}\) percentile (for sample size \( \geq 20 \))
      c. 90\(^{th}\) percentile (for sample size \( \geq 10 \))
  iv. Descriptors of the Cool End of the Distribution
      a. 1\(^{st}\) percentile (for sample size \( \geq 33 \))
      b. 5\(^{th}\) percentile (for sample size \( \geq 20 \))
      c. 10\(^{th}\) percentile (for sample size \( \geq 10 \))

Denominator:
Live-born neonates with a birthweight less than 2500 grams (as identified from either the medical record or by ICD-9-CM Principal or Other Diagnosis Codes in Table 1) admitted to a level 2 or higher nursery within
24 hours of birth. Children identified as having received Level 2 care either via medical record review and/or via revenue code 172, 173, or 174 shall be eligible for the denominator. 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>Diagnosis Code</th>
<th>Code</th>
<th>Diagnosis Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>76400</td>
<td>LIGHT-FOR-DATES WTNOS</td>
<td>76490</td>
<td>FET GROWTH RETARD WTNOS</td>
</tr>
<tr>
<td>76401</td>
<td>LIGHT-FOR-DATES &lt;500G</td>
<td>76491</td>
<td>FET GROWTH RETARD &lt;500G</td>
</tr>
<tr>
<td>76402</td>
<td>LT-FOR-DATES 500-749G</td>
<td>76492</td>
<td>FET GROWTH RET 500-749G</td>
</tr>
<tr>
<td>76403</td>
<td>LT-FOR-DATES 750-999G</td>
<td>76493</td>
<td>FET GROWTH RET 750-999G</td>
</tr>
<tr>
<td>76404</td>
<td>LT-FOR-DATES 1000-1249G</td>
<td>76494</td>
<td>FET GROWTH RET 1000-1249G</td>
</tr>
<tr>
<td>76405</td>
<td>LT-FOR-DATES 1250-1499G</td>
<td>76495</td>
<td>FET GROWTH RET 1250-1499G</td>
</tr>
<tr>
<td>76406</td>
<td>LT-FOR-DATES 1500-1749G</td>
<td>76496</td>
<td>FET GROWTH RET 1500-1749G</td>
</tr>
<tr>
<td>76407</td>
<td>LT-FOR-DATES 1750-1999G</td>
<td>76497</td>
<td>FET GROWTH RET 1750-1999G</td>
</tr>
<tr>
<td>76408</td>
<td>LT-FOR-DATES 2000-2499G</td>
<td>76498</td>
<td>FET GROWTH RET 2000-2499G</td>
</tr>
<tr>
<td>76410</td>
<td>LT-FOR-DATE W/MAL WTNOS</td>
<td>76500</td>
<td>EXTREME IMMATURE WTNOS</td>
</tr>
<tr>
<td>76411</td>
<td>LT-FOR-DATE W/MAL &lt;500G</td>
<td>76501</td>
<td>EXTREME IMMATURE &lt;500G</td>
</tr>
<tr>
<td>76412</td>
<td>LT-DATE W/MAL 500-749G</td>
<td>76502</td>
<td>EXTREME IMMATURE 500-749G</td>
</tr>
<tr>
<td>76413</td>
<td>LT-DATE W/MAL 750-999G</td>
<td>76503</td>
<td>EXTREME IMMATURE 750-999G</td>
</tr>
<tr>
<td>76414</td>
<td>LT-DATE W/MAL 1000-1249G</td>
<td>76504</td>
<td>EXTREME IMMATURE 1000-1249G</td>
</tr>
<tr>
<td>76415</td>
<td>LT-DATE W/MAL 1250-1499G</td>
<td>76505</td>
<td>EXTREME IMMATURE 1250-1499G</td>
</tr>
<tr>
<td>76416</td>
<td>LT-DATE W/MAL 1500-1749G</td>
<td>76506</td>
<td>EXTREME IMMATURE 1500-1749G</td>
</tr>
<tr>
<td>76417</td>
<td>LT-DATE W/MAL 1750-1999G</td>
<td>76507</td>
<td>EXTREME IMMATURE 1750-1999G</td>
</tr>
<tr>
<td>76418</td>
<td>LT-DATE W/MAL 2000-2499G</td>
<td>76508</td>
<td>EXTREME IMMATURE 2000-2499G</td>
</tr>
<tr>
<td>76420</td>
<td>FETAL MALNUTRITION WTNOS</td>
<td>76510</td>
<td>PRETERM INFANT NEC WTNOS</td>
</tr>
<tr>
<td>76421</td>
<td>FETAL MALNUTRITION &lt;500G</td>
<td>76511</td>
<td>PRETERM NEC &lt;500G</td>
</tr>
<tr>
<td>76422</td>
<td>FETAL MALNUTRITION 500-749G</td>
<td>76512</td>
<td>PRETERM NEC 500-749G</td>
</tr>
<tr>
<td>76423</td>
<td>FETAL MAL 750-999G</td>
<td>76513</td>
<td>PRETERM NEC 750-999G</td>
</tr>
<tr>
<td>76424</td>
<td>FETAL MAL 1000-1249G</td>
<td>76514</td>
<td>PRETERM NEC 1000-1249G</td>
</tr>
<tr>
<td>76425</td>
<td>FETAL MAL 1250-1499G</td>
<td>76515</td>
<td>PRETERM NEC 1250-1499G</td>
</tr>
<tr>
<td>76426</td>
<td>FETAL MAL 1500-1749G</td>
<td>76516</td>
<td>PRETERM NEC 1500-1749G</td>
</tr>
<tr>
<td>76427</td>
<td>FETAL MALNUTRITION 1750-1999G</td>
<td>76517</td>
<td>PRETERM NEC 1750-1999G</td>
</tr>
<tr>
<td>76428</td>
<td>FETAL MALNUTRITION 2000-2499G</td>
<td>76518</td>
<td>PRETERM NEC 2000-2499G</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}

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 6:** 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 7:** Describe the distribution of the temperatures. Minimum sample sizes for several moments are shown. Report all temperatures with their associated variables, N, and the following descriptors.

This measure requests the reporting of the following:

i. Descriptors of the Center of the Distribution (for sample size >=5)
   a. Mean
   b. Median (50th percentile)
   c. 25th percentile
   d. 75th percentile

ii. Descriptors of Dispersion
   a. Interquartile range (for sample size >=5)
   b. Standard Deviation (for sample size >=10)

iii. Descriptors of the Warm end of the Distribution
   a. 99th percentile (for sample size >=33)
   b. 95th percentile (for sample size >=20)
   c. 90th percentile (for sample size >=10)

iv. Descriptors of the Cool End of the Distribution
   a. 1st percentile (for sample size >=33)
b. 5th percentile (for sample size >=20)
c. 10th percentile (for sample size >=10)

Step 8. Using eligible births and qualified temperatures, repeat step 7 and 8 to 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:
   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 Code¹ or UIC. (2013 urban influence codes available at: [http://www.ers.usda.gov/data-products/urban-influence-codes.aspx#.UZUvG2cVoj8](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/](http://mcdc.missouri.edu/)).


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 \( \leq 12.5\% \)

ii. Second Quartile of Poverty if percent in poverty is \( >12.5\% \) and \( \leq 16.5\% \)

iii. Third Quartile of poverty if percent in poverty is \( >16.5\% \) and \( \leq 20.7\% \)

iv. First upper quartile (75th-90th) if percent in poverty is \( >20.7\% \) and \( \leq 25.7\% \)

v. Second upper quartile (>90th percentile) if percent in poverty exceeds 25.7%

iii. Repeat stratifications a-g within birthweight categories