

Vermont Oxford Network
NQF Measure 0484
Proportion of Infants 22 to 29 Weeks Gestation Treated with Surfactant
Who are Treated within 2 Hours of Birth

NQF Measure Number:

0484

Measure Description:

Proportion of infants 22 to 29 weeks gestation who were treated with surfactant within two hours of birth among all infants treated with surfactant in the gestational age range.

Population:

Any infant treated with surfactant who is born at the reporting hospital and whose gestational age is between 22 weeks, 0 days and 29 weeks, 6 days, regardless of where in the hospital the infant receives care.

Any outborn infant treated with surfactant who is admitted to any location in the reporting hospital within 28 days of birth, without first having gone home, and whose gestational age is between 22 weeks, 0 days and 29 weeks, 6 days, regardless of where in the hospital the infant receives care.

Exclusions:

1. Infants outside the gestational age range of 22 to 29 weeks.
2. Outborn infants admitted more than 28 days after birth.
3. Outborn infants who have been home prior to admission.
4. Infants not treated with surfactant.

Measure Stratification:

The following stratifications for this measure will be useful:

- By birth location (inborn infants, outborn infants, all infants).
- Within each birth location stratum, by three strata for treatment with nasal CPAP (continuous positive airway pressure).
 - Infants administered Nasal CPAP prior to endotracheal tube ventilation.
 - Infants administered Nasal CPAP after endotracheal tube ventilation.
 - Infants not administered Nasal CPAP.
- By week of gestational age.

Calculation Instructions

1. Identify the *population of eligible infants*: all infants treated with surfactant prior to discharge whose gestational age is between 22 weeks, 0 days, and 29 weeks, 6 days, and who were born at or admitted to the hospital within 28 days of birth without having been discharged home.

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2. Among the population of eligible infants:
 - a. Determine whether the first dose of surfactant was administered within two hours of birth.
 - b. Count the number of infants born in the hospital. This number will be the denominator for eligible inborn infants: *DENOM INBORN*.
 - c. Count the number of outborn infants. This number will be the denominator for eligible outborn infants: *DENOM OUTBORN*.
 - d. Count the number of all infants. This number will be the denominator for all eligible infants: *DENOM ALL*.
 - e. Count the number of inborn infants who received the first dose of surfactant within two hours of birth. This number is the numerator for eligible inborn infants: *NUM INBORN*.
 - f. Count the number of outborn infants who received the first dose of surfactant within two hours of birth. This number is the numerator for eligible outborn infants: *NUM OUTBORN*.
 - g. Count the total number of infants who received the first dose of surfactant within two hours of birth. This number is the numerator for all eligible infants: *NUM ALL*.

3. Calculate the proportion of infants receiving surfactant within two hours of birth for the birth location strata:
 - a. The measure for Inborn Infants is defined as:
$$\frac{NUM\ INBORN}{DENOM\ INBORN}$$

This measure represents the proportion of inborn infants 22 to 29 weeks gestation treated with surfactant who received the first dose of surfactant within 2 hours of birth.
 - b. The measure for Outborn Infants is defined as:
$$\frac{NUM\ OUTBORN}{DENOM\ OUTBORN}$$

This measure represents the proportion of outborn infants 22 to 29 weeks gestation treated with surfactant who received the first dose of surfactant within 2 hours of birth.
 - c. The measure for All Infants is defined as:
$$\frac{NUM\ ALL}{DENOM\ ALL}$$

This measure represents the proportion of all infants 22 to 29 weeks gestation (inborn and outborn) treated with surfactant who received the first dose of surfactant within 2 hours of birth.

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4. Among population of eligible infants in each of the birth location strata (inborn, outborn, and all infants):
 - a. Identify whether each infant received nasal CPAP at any time prior to discharge.
 - b. For eligible infants who received nasal CPAP, identify whether the infant received nasal CPAP prior to or after having received positive pressure ventilation through an endotracheal tube.
 - c. Among eligible infants who did not receive nasal CPAP:
 - (1) Count the number of inborn infants. This will be the denominator for eligible inborn infants who did not receive nasal CPAP: *DENOM INBORN NO CPAP*.
 - (2) Count the number of inborn infants who received surfactant treatment within two hours of birth. This will be the numerator for eligible inborn infants who did not receive nasal CPAP: *NUM INBORN NO CPAP*.
 - (3) Calculate the proportion of inborn infants receiving surfactant within two hours of birth who did not receive nasal CPAP:
$$\text{NUM INBORN NO CPAP} / \text{DENOM INBORN NO CPAP}$$

This measure represents the proportion of inborn infants who did not have nasal CPAP and who were treated with surfactant within two hours of birth.
 - (4) Count the number of outborn infants. This will be the denominator for eligible outborn infants who did not receive nasal CPAP: *DENOM OUTBORN NO CPAP*.
 - (5) Count the number of outborn infants who received surfactant treatment within two hours of birth. This will be the numerator for eligible outborn infants who did not receive nasal CPAP: *NUM OUTBORN NO CPAP*.
 - (6) Calculate the proportion of outborn infants receiving surfactant within two hours of birth who did not receive nasal CPAP:
$$\text{NUM OUTBORN NO CPAP} / \text{DENOM OUTBORN NO CPAP}$$

This measure represents the proportion of outborn infants who did not receive nasal CPAP and who were treated with surfactant within two hours of birth.
 - d. Among eligible infants who received nasal CPAP prior to endotracheal tube ventilation (*early CPAP*):
 - (1) Count the number of inborn infants. This will be the denominator for eligible inborn infants who received early CPAP: *DENOM INBORN EARLY CPAP*.

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- (2) Count the number of inborn infants who received surfactant treatment within two hours of birth. This will be the numerator for eligible inborn infants who received early CPAP: *NUM INBORN EARLY CPAP*.
- (3) Calculate the proportion of inborn infants receiving surfactant within two hours of birth who received early CPAP:

$$\text{NUM INBORN EARLY CPAP} / \text{DENOM INBORN EARLY CPAP}$$

This measure represents the proportion of inborn infants who received early CPAP and who were treated with surfactant within two hours of birth.

- (4) Count the number of outborn infants. This will be the denominator for eligible outborn infants who received early CPAP: *DENOM OUTBORN EARLY CPAP*.
- (5) Count the number of outborn infants who received surfactant treatment within two hours of birth. This will be the numerator for eligible outborn infants who received early CPAP: *NUM OUTBORN EARLY CPAP*.
- (6) Calculate the proportion of outborn infants receiving surfactant within two hours of birth who received early CPAP:

$$\text{NUM OUTBORN EARLY CPAP} / \text{DENOM OUTBORN EARLY CPAP}$$

This measure represents the proportion of outborn infants who received early CPAP and who were treated with surfactant within two hours of birth.

- e. Among eligible infants who received nasal CPAP after endotracheal tube ventilation (*late CPAP*):

- (1) Count the number of inborn infants. This will be the denominator for eligible inborn infants who received late CPAP: *DENOM INBORN LATE CPAP*.
- (2) Count the number of inborn infants who received surfactant treatment within two hours of birth. This will be the numerator for eligible inborn infants who received late CPAP: *NUM INBORN LATE CPAP*.
- (3) Calculate the proportion of inborn infants receiving surfactant within two hours of birth who received late CPAP:

$$\text{NUM INBORN LATE CPAP} / \text{DENOM INBORN LATE CPAP}$$

This measure represents the proportion of inborn infants who received late CPAP and who were treated with surfactant within two hours of birth.

- (4) Count the number of outborn infants. This will be the denominator for eligible outborn infants who received late CPAP: *DENOM OUTBORN LATE CPAP*.

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- (5) Count the number of outborn infants who received surfactant treatment within two hours of birth. This will be the numerator for eligible outborn infants who received late CPAP: *NUM OUTBORN LATE CPAP*.
- (6) Calculate the proportion of outborn infants receiving surfactant within two hours of birth who received late CPAP:

$$\text{NUM OUTBORN LATE CPAP} / \text{DENOM OUTBORN LATE CPAP}$$

This measure represents the proportion of outborn infants who received late CPAP and who were treated with surfactant within two hours of birth.

5. Definitions:

Data item definitions are from the Vermont Oxford Network Manual of Operations, available on-line at <http://www.vtoxford.org/tools/ManualofOperationsPart2.pdf>.

- a. Nasal CPAP. Indicate whether the infant was administered nasal CPAP:
- Check "**Yes**" if the infant was given continuous positive airway pressure applied through the nose at any time after leaving the Initial Resuscitation Area.
- Check "**No**" if the infant was never given continuous positive airway pressure applied through the nose after leaving the Initial Resuscitation Area.
- NOTE: Nasal IMV (intermittent mandatory ventilation) and nasal SIMV (synchronized intermittent mandatory ventilation) are both considered forms of nasal CPAP for the purpose of this definition. High flow nasal cannula oxygen is NOT considered nasal CPAP for the purpose of this definition.
- b. Nasal CPAP before endotracheal tube (ETT) ventilation:
- Check "**Yes**" if the infant was given continuous positive airway pressure applied through the nose without having previously received intermittent positive pressure breaths through an endotracheal tube.
- Check "**No**" if the infant received intermittent positive pressure breaths through an endotracheal tube before being given continuous positive airway pressure applied through the nose.
- NOTE: Nasal CPAP before endotracheal tube (ETT) ventilation is only completed when the answer to Nasal CPAP is "Yes".

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c. Gestational Age:

Record the best estimate of gestational age in weeks (Item 2a) and days (Item 2b) using the following hierarchy:

- (1) Obstetrical measures based on last menstrual period, obstetrical parameters, and prenatal ultrasound as recorded in the maternal chart.
- (2) Neonatologist's estimate based on physical criteria, neurologic examination, combined physical and gestational age exam (Ballard or Dubowitz), or examination of the lens

The best estimate should be recorded in weeks and days. In instances when the best estimate of gestational age is an exact number of weeks, enter the number of weeks in the space provided for weeks and enter "0" in the space provided for days. Do not leave the number of days blank.

d. Location of Birth:

Check "**Inborn**" if the infant was delivered at your center.

Check "**Outborn**" if the infant was delivered outside your center. Any infant requiring ambulance transfer will be considered outborn. When completing Network data forms for outborn infants, use all information available from the hospital that transferred the infant to your center as well as from your own hospital.

e. Surfactant at Any Time

Check "**Yes**" if the infant received an exogenous surfactant at any time.

Check "**No**" if the infant never received an exogenous surfactant.

f. Surfactant Time to First Dose:

If surfactant was given at any time, enter the infant's postnatal age in hours and minutes at the time when the first dose of surfactant was administered. For inborn infants, the first dose may have occurred prior to or after NICU admission. For outborn infants, the first dose may have occurred before transfer, during transport or at your hospital.

The postnatal age at first dose is the interval in hours and minutes, to the nearest minute, between the date and time of birth and the date and time at which the first dose was given. If the precise age at first dose is unknown, but an estimated age at first dose can be reliably determined to the nearest 15 minutes, please record this estimate. If the best estimate of age at first dose to the nearest 15 minutes cannot be determined, the item will be considered "Unknown".

EXAMPLE 1: An infant is born at 15:30 hours on October 1 in your hospital. The first dose of surfactant is given at 15:45 hours on October 1 in the delivery room. The postnatal age at first dose is 0 hours and 15 minutes.

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EXAMPLE 2: An infant is born at 15:30 hours on October 1 in an outlying hospital. The first dose of surfactant is given at 15:45 hours on October 1 in the delivery room at that hospital. The infant is subsequently transferred to your hospital. The postnatal age at first dose is 0 hours and 15 minutes.

EXAMPLE 3: An infant is born at 15:30 hours on October 1. The first dose of surfactant is given at 15:00 hours on October 4. The age at first dose is 71 hours and 30 minutes.

EXAMPLE 4: An infant is born at 15:30 hours on October 1. The first dose of surfactant is given at 16:30 hours on October 1. The age at first dose is 1 hour and 0 minutes. (Please record as 1 hour and 0 minutes, rather than 0 hours and 60 minutes.)

Vermont Oxford Network Contact:

Beth Anderson, Director of Operations, 802-865-4814, x 237,
banderson@vtoxford.org.