# NICU Data Manual of Definitions

*2019*

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# Introduction

In this manual you will find definitions for data collection for the A/D, DRD, CPETs, and CCS forms. You will also find detailed information for the CCS Report.

If you have questions or need additional assistance, you can contact the Data Center team by submitting a ticket through our Help Desk system at www.cpqcchelp.org. Please feel free to ask any data related questions or raise any issues you have through this system. The Help Desk also provides a set of Frequently Asked Questions for quick answers to common questions.

Note that this is a manual explaining how to enter data for infants in the NICU Database, on the NICU Data site.

# NICU Data Eligibility

The NICU Data website collects the elements of the NICU Database on-line. Starting in 2007, CPQCC as an agent of the **California Perinatal Transport System (CPeTS)** is also collecting data on all infants who were transported into a participating NICU for medical/diagnostic services or surgery.

### Infants meeting the following criteria are eligible for the NICU Database:

- The infant's birth weight is 401 to 1,500 grams, and was born or admitted at your hospital withing 28 days of birth.
- The infant's gestational age is 22 weeks to 31 weeks and 6 days (less than 32 weeks), and was born or admitted at your hospital within 28 days of birth.
- The infant was admitted to your hospital within 28 days of birth and at least one of the following conditions applied:
    - Infant death;
    - Major surgery;
    - Intubated Assisted Ventilation greater than 4 continuous hours;
    - Acute transport-in to receive medical, diagnostic, or surgical therapy that cannot be provided at the sending hospital;
    - Early bacterial sepsis;
    - Total Serum Bilirubin of ≥ 25 mg/dL (427 micromols/Liter) and/or an exchange transfusion;
    - Nasal IMV/SIMV or any other form of non-intubated assisted ventilation greater than 4 continuous hours.
    - *Suspected* encephalopathy or *suspected* perinatal asphyxia defined as cardiorespiratory depression at birth based on any one (or more) of the following: (1) pH less than 7.0 on an umbilical blood sample or a blood gas obtained within one hour of life, (2) 5-minute Apgar score of less than or equal to 3, or (3) 10-minute Apgar score of less than or equal to 4.
    - Underwent active therapeutic hypothermia, in other words, the infant was actively cooled (received hypothermia therapy) during the admission to your NICU [active cooling includes selective head cooling or whole body cooling];
    - Compelling clinical evidence of seizures, or of focal or multifocal clonic or tonic seizures. Included in this definition is also EEG evidence of seizures regardless of clinical status.

Note:

1. Any infant with a birth weight greater than 1,500 grams is eligible for the NICU Database if the infant is admitted to your NICU within 28 days of birth, and then fulfills at least one of the above criteria during the episode of care in your NICU. For hyperbilirubinemia/exchange transfusion, the infant may or may not be admitted to your NICU.

2. "A live borninfant is one who breathes or has any evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscle, regardless of whether the umbilical cord has been cut or the placenta is attached. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps."
   *Source:*American Academy of Pediatrics: Clinical Reports: Standard Terminology for Fetal, Infant, and Perinatal Deaths. The Committee on Fetus and Newborn. Pediatrics 2011; 128:1 177-181.

## Infants meeting the following acute inter-facility transport criteria are eligible for the CPeTS Acute Inter-facility Transports database:

**A CPeTS Acute Inter-facility Transport** into your NICU is defined as: "the movement of an infant from one inpatient setting to another inpatient setting for a higher level of care on or before day 28 of life (i.e. medical, diagnostic, or surgical therapy that cannot be provided at the sending hospital.)." In the NICU Database, this is called an Acute Transport.

Transport Form Use During a Declared Disaster: When the Governor of the State of California has declared a region a "Designated Disaster Area," infants being transported from or to a facility, in order to comply with evacuation orders, do not need a completed CPeTS Neonatal Transport Form.

Starting from 2019, this definition was amended to no longer include infants transported for insurance or staffing/bed availability issues.

Note:

1. Infants who were transported into your center for growth/discharge planning or chronic/hospice care, or for insurance reasons or bed availability/staffing reasons are not eligible for the CPeTS Acute Inter-Facility Transports database.

2. An infant that is Acutely Transported-in by a NICU Transport Team from another facility is also considered an Acute Transport-In and is eligible for the CPeTS Acute Inter-Facility Transports database.

**Examples:**

| Birth Weight (grams) | Gestational Age (Weeks/Days) | Transported-In | Event | NICU Database Eligibility | Forms Needed |
|---|---|---|---|---|---|
| 350 | 22/0 | No | None | Eligible | A/D |

| Birth Weight (grams) | Gestational Age (Weeks/Days) | Transported-In | Event | NICU Database Eligibility | Forms Needed |
|---|---|---|---|---|---|
| 400 | 21/6 | No | None | Not Eligible | - |
| 401 | 21/6 | No | None | Eligible | A/D |
| 475 | 23/6 | No | Delivery Room Death | Eligible | DRD |
| 475 | 23/6 | Yes - Chronic Care | None | Eligible | A/D |
| 475 | 23/6 | Yes - Surgery | None | Eligible | CPeTS & A/D |
| 1500 | 30/0 | No | None | Eligible | A/D |
| 1500 | 30/0 | Yes - Growth | None | Eligible | A/D |
| 1501 | 22/0 | No | None | Eligible | A/D |
| 1501 | 22/0 | No | Infant Death | Eligible | A/D |
| 1600 | 20/0 | No | None | Not Eligible | - |
| 1600 | 20/0 | Yes - Chronic Care | None | Not Eligible | - |
| 1600 | 20/0 | Yes - DX/RX Services | Acute Transport-In | Eligible | CPeTS & A/D |
| 1600 | 30/0 | No | Ventilation > 4 hours | Eligible | A/D |
| 1767 | 31/1 | No | Delivery Room Death | Eligible | DRD |

| Birth Weight (grams) | Gestational Age (Weeks/Days) | Transported-In | Event | NICU Database Eligibility | Forms Needed |
|---|---|---|---|---|---|
| 1890 | 32/5 | Yes - Insurance | None | Eligible prior to 2019. | - |

# NICU Data DRD Form and Admission/Discharge Form

## Demographics

### Center Network ID [HOSPNO]

4-digit NICU ID assigned to your center.

### Infant ID [ID]

Each eligible infant is assigned a record ID beginning with 1. For each new infant, assign the next sequential number. Do not begin the next year reusing 1 or other numbers previously used; instead assign the next sequential number.

Note:

Each record ID in the NICU Database describes one infant's **episode of care** in the hospital.

An **episode of care** is defined as all the care that an infant receives until they are discharged to home. If an infant is moved from your NICU to another unit within your Center (Step-Down Unit, Well Baby Nursery, Pediatrics Ward, Intermediate Care Nursery, PICU, etc.), continue collecting data until discharge to home, transport to another hospital, or death. If the infant is readmitted to the hospital from home, that is considered a new episode of care.

Included in a single **episode of care**:

- Admission and readmission to the NICU, PICU, or any other units within the hospital **("Hospital A")**
- Acute transport to and from other hospitals **("Hospital B")**, code anything that occurred at any prior NICU.
- After care at **Hospital B**, readmission directly to **Hospital A**

### Year of Birth [BYEAR]

Infant Year of Birth.

### Deleted Flag

### Item 1. Birth Weight [BWGT]

Record the birth weight in grams. Since many weights may be obtained on an infant shortly after birth, enter the weight from the Labor and Delivery record if available and judged to be accurate. If unavailable or judged to be inaccurate, use the weight on admission to the neonatal unit or lastly, the weight obtained on autopsy (if the infant expired within 24 hours of birth).

Do **not** use a comma separator as in 1,224. Use only numbers as in 1224.

## Item 2. Head Circumference at Birth [BHEADCIR]

Enter the head circumference to the nearest tenth of a centimeter as recorded in the chart or clinical flow sheets on the day of birth. If the head circumference was not recorded on the day of birth, record the first head circumference measurement taken on the following day. The head circumference entries allowed should be between 10.0 cm and 70.0 cm.

Select **Not Done** if the head circumference was not measured on the day of birth or on the following day.

Select **Unknown** if this information cannot be obtained.

## Item 3. Best Estimate of Gestational Age [GAWEEKS], [GADAYS]

Starting from 2018, CPQCC has adopted the JC definition of gestational age:

Gestational age is defined as the best obstetrical estimate (OE) of the newborn's gestation in completed weeks based on the birth attendant's final estimate of gestation, irrespective of whether the gestation results in a live birth or a fetal death. This estimate of gestation should be determined by all perinatal factors and assessments such as ultrasound, but not the newborn exam. Ultrasound taken early in pregnancy is preferred (source: American College of Obstetricians and Gynecologists reVITALize Initiative).

Source: https://manual.jointcommission.org/releases/TJC2017A/DataElem0265.html

In the cases where there is no prenatal care or there are significant discrepancies between the obstetrical gestational age and neonatal gestational age (i.e., over two weeks), please determine the gestational age from the neonatologist exam.

Select the gestational age in completed weeks and days.

Select **Unknown** if the information cannot be obtained.

Note:

Entering or updating gestational age will affect the collection of several items on this form. For instance, for NICUs not participating in the expanded VON data collection, item 51 (HIE) will only be unlocked if an infant's gestational age has been entered.

## Infant's Date and Time of Birth

## Item 4a. Infant's Date of Birth [BDATE]

Enter the infant's date of birth. Note that the on-line form allows "short" date entries and tries to convert them to the correct date. For instance, entering 1211 will be converted to 12-11-BIRTHYEAR.

The date of birth is used in subsequent portions of the A/D form to determine the date of Day 3, date of Day 28, the date of Week 36 adjusted gestational age, initial length of stay and total length of stay for infants who are transported out.

In the context of the A/D, DRD and CPeTS form, the date of birth is used together with the mother's date of birth to determine the maternal age at delivery.

### Item 4b. Infant's Time of Birth [BTIME]

Enter the infant's time of birth on the 24-hour clock.

The time of birth is used to obtain the number of hours/minutes to firrst surfactant treatment. For infants who are acutely transported to your NICU, the value for time of birth is propagated from / to the CPeTS form when saving a form.

### Item 5. Infant Sex [SEX]

Select **Male** or **Female**.

Select **Unknown** if sex cannot be determined or is unknown.

### Item 6. Delivery Room Death [DELDIE]

Select **Yes** if the infant was born in your center, was never admitted to the NICU, and died in the delivery room or at any other location in your hospital within 12 hours after birth. These locations may include the mother's room, resuscitation rooms or any location other than the NICU in your hospital.

Select **No** if the infant did not die in the delivery room or at any other location in your hospital within 12 hours after birth and prior to admission to the NICU. Select **No** for all outborn infants. If No, complete the Admission/Discharge Form.

Note:

a. Hospital policies vary concerning the physical placement of a non-viable infant for the purpose of providing "comfort care." These infants may be physically cared for in a variety of locations including the delivery room, the OB recovery room, and the mother's room or even the Nursery or NICU. If a hospital policy dictates that this type of infant be formally admitted to the NICU for end-of-life care, then an Admission/Discharge form must be completed on this infant. If hospital policy dictates that the infant is **NOT** formally admitted to the NICU for end-of-life care, a Delivery Room Death form should be completed.

b. The on-line form does not allow you to change the delivery room death check box. Whether or not the infant died in the delivery room has to be established prior to this screen.

c. On 11/1/2011 VON has updated the definition of live birth. The Delivery Room Death definition includes a note that reads:

   The definition of live born was updated to use the standard terminology recommendation of The Committee on Fetus and Newborn of the American Academy of Pediatrics: "A live born infant is one who breathes or has any evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscle, regardless of whether the umbilical has been cut or the placenta is attached. Heartbeats are to be

distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps."

## Item 7a. Location of Birth [LOCATE]

The purpose of this question is to find out where the infant was born.

Select **Inborn** if the infant was delivered in your center on this admission. This includes any location within your center, e.g., Labor & Delivery, Antepartum unit, Emergency Room AND was never sent home after birth. If inborn, items 7b, 7c, 8a and 8b are Not Applicable. For Satellite NICUs the Inborn option cannot be selected.

Select **Outborn** if the infant was born in another facility OR was at any location outside your Center OR was home at any time after birth. Any infant requiring ambulance transfer is considered outborn. When completing the Admission/Discharge 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.

Select **Born at Co-Located Hospital** (Satellite NICUs Only) if your center is a satellite NICU and the infant was delivered in the co-located hospital. This includes any location within the co-located hospital, e.g., Labor & Delivery, Antepartum unit, Emergency Room. For non-satellite NICUs the option (Born at Co-located Hospital) cannot be selected.

Note:

a. Data must be collected on all inborn infants meeting the eligibility criteria, including infants who were liveborn, but died in the delivery room or prior to NICU admission. For delivery room deaths, this item should always be coded **Inborn**.

b. For the situation in which a baby is born at your center, then sent home and then after home discharge is re-admitted to your center, you need to:

    1. Fill out a new form and assign a new network ID number.
    2. Check the baby as Outborn.
    3. Check the age in days at the re-admission (Item 7b).
    4. Check your own center as the location of birth (Item 7c).

c. The prior situation also applies to Satellite NICUs. In other words, if an infant was previously home, this infant should always be coded as Outborn. The logic is the same as for Centers who have an infant who was initially admitted to their NICU after birth and then re-admitted from home; this Center would have to enter this infant as Outborn as well.

d. For Satellite NICUs, infants who are delivered at the Main NICU and then transferred to the Main NICU's Satellite NICU are considered Outborn infants.

## Item 7b. Day of NICU Admission [DAYADMISS]

The Day of NICU Admission is the day of life on which the infant is admitted to your hospital's NICU considering the date of birth as day 1. For example, if an outborn infant is born on June 1, and admitted to your hospital's NICU on June 1, the Day of Admission would be 1. If that same infant were admitted to your hospital's NICU on June 3, the Day of NICU Admission would be 3.

To determine the Day of Admission to your NICU you must know the Date of Birth and the Date of NICU Admission. The time of birth does not matter. If the infant is born at 11:30 PM and admitted to your hospital's NICU at 11:59 PM on the same day, the Day of NICU Admission is 1, since the infant was admitted on the Date of Birth.

Note:

a. For inborn infants with birth weights of less than or equal to 1,500 grams or a gestational age of 22 to 29 weeks of gestation, this item defaults to 1 which means that these infants are assumed to be admitted to the NICU on the day of birth.

b. The **delivery room deaths**, this item has to be coded 1.

## Item 7c. Hospital Location of Birth [BIRTHLOCATION]

For outborn infants only or for infants who were previously sent home, and then re-admitted within 28 days of birth, select the birth hospital from the selection list.

If the baby was born in your center, then sent home and re-admitted to your center, the birth location is your center.

The list on the form is sorted in alphabetical order by hospital name. You can use the search function built into the drop-down list to search for any name part of the transport location, or you can use the transport location's OSHPD ID as search term.

Note:

If you select "Born at Co-located Hospital" for the location of birth field, the system will automatically set the hospital of birth to the Hosting Hospital's OSHPD ID number. The birth location will be grayed out and cannot be changed.

## Hospital Admission History

## Item 8a. Previously Discharged Home [PDH]

Select **Never home after birth** if the infant has never been discharged to home from a hospital location since birth.

A home birth does NOT qualify for checking "Was Previously Discharged Home after Birth."

Select **Was Discharged Home from a Hospital after Birth** if the infant has been discharged to home from a hospital location since birth.

Note:

a. A home birth that was admitted to your NICU should be coded as "Never home after birth," unless the infant was admitted to a hospital after the home birth, then discharged, and then readmitted to the NICU.

b. This item is Not Applicable for inborn infants or infants born at the co-located hospital for satellite centers.

### Item 8b. Re-Admission After Previous Discharge Home [READMIT]

Select **First Admission to this NICU** if this admission is the first time the infant has been in your NICU.

Select **Readmission to this NICU** if the infant has previously been in your NICU.

Select **Unknown** if this information cannot be obtained.

Note:

a. For a hyperbilirubinemia / exchange transfusion infant, the infant can be admitted or re-admitted to any location in your hospital.

b. This item is Not Applicable if the infant is inborn / born at the co-located hospital for satellite centers, or outborn and never previously discharged home.

## Maternal History

### Item 9. Maternal Birth Date and Age

### Maternal Birth Date [MDATE]

Enter the mother's birth date as mm-dd-yyyy. Note that the on-line form allows "short" date entries and tries to convert them to the correct date. For instance, entering 12111989 will be converted to 12-11-1989.

Provided a correct maternal birth date is provided, the corresponding maternal age at the time of the delivery will be auto-populated using the entered infant date of birth.

Select **unknown** if the mother's date of birth is unknown.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

### Maternal Age [MAGE]

If the mother's date of birth is unknown, but the mother's age at the time of the delivery is known, enter the mother's age at time of delivery. Give her age in completed years; meaning that a woman who is 30 years and 364 days old should be recorded as 30 years old, not 31.

Check **unknown** if the mother's age at time of the delivery is unknown.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 10a. Mother's Hispanic Origin [HISP]

Select **Yes** if the biological mother is a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

Select **No** if the biological mother's ethnicity is not of Hispanic or Latino origin as defined above.

Select **Unknown** if the maternal ethnicity is not known.

Note:

a. Ethnic and racial data help us to monitor differences in perinatal risks and outcomes in California, and to adjust for these differences when comparing hospitals with diverse populations. The CPQCC race classification scheme for 2005 follows that used by Vermont Oxford Network, which combines Asian and Pacific Islander groups, includes a residual "Other" category, and only allows for a single choice. In future years, CPQCC will standardize with California State standards and allow multiracial categorization.

b. Finding Race and Ethnicity Data. The Automated Vital Statistics System (AVSS) is now used in all birthing hospitals in California to produce paper and electronic birth certificates. It is important for CPQCC Data Collectors to understand that the AVSS system is probably used in your Center and that it collects ethnicity and race data in a manner consistent with new State and Federal standards for multiple race reporting. CPQCC encourages members to use their Center's AVSS system as the primary source of maternal race and ethnicity information.

c. Self-identification. Maternal Ethnicity and Race should be completed by or with direct assistance of the informant. Appearance, language, or other personal attributes do not necessarily determine ethnicity or race. A woman who speaks Spanish, was born in Mexico, and says that she is not Hispanic, but claims to be a Native American, should be recorded as non-Hispanic Native American. The responses for the Ethnicity and Race (Items 9a and 9b) should be obtained by review of the birth certificate or personal interview with the mother (see information above about AVSS), if possible. Obtaining the information from a review of medical records is less preferable.

d. For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 10b. Mother's Race [MATRACE]

Select **Black or African American** if the biological mother is a person having origins in any of the black racial groups of Africa.

Select **Asian** if the biological mother is a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.

Select **Native Hawaiian or Other Pacific Islander** if the biological mother is a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Select **American Indian or Alaska Native** if the biological mother is a person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.

Select **White** if the biological mother is a person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

Select **Other** if none of the race categories above applies to the biological mother.

Note:

a. Ethnic and racial data help us to monitor differences in perinatal risks and outcomes in California, and to adjust for these differences when comparing hospitals with diverse populations. The CPQCC race classification scheme for 2012 follows that used by Vermont Oxford Network, which includes a residual "Other" category and only allows for a single choice. In future years, CPQCC will standardize with California State standards and allow multiracial categorization.

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c. Self-identification. Maternal Ethnicity and Race should be completed by or with direct assistance of the informant. Appearance, language, or other personal attributes do not necessarily determine ethnicity or race. A woman who speaks Spanish, was born in Mexico, and says that she is not Hispanic, but claims to be a Native American, should be recorded as non-Hispanic Native American. The responses for the Ethnicity and Race (Items 10a and 10b) should be obtained by review of the birth certificate or personal interview with the mother (see information above about AVSS), if possible. Obtaining the information from a review of medical records is less preferable.

d. Coding **multiple maternal races**. Many hospitals now record multiple Maternal races in their database systems. For the 2012 data collection, in cases where multiple maternal races have been recorded, use the following hierarchy: Black, Asian, Native Hawaiian or Pacific Islander, American Indian or Alaska Native, White, Other, Unknown. From the multiple races reported, choose the race that appears first in the above hierarchy. Note that the order of the categories in the on-line and hard copy forms reflect the rank order coding for multiple races.
For example, a mother recorded as Black, Asian, and White should be coded as Black. A Mother recorded as Native American and White should be coded as Native American. Do not code a multi-race mother as "Other" or "Unknown." These categories are reserved for

mothers who claim a race not represented in the available codes, and for situations in which information on race is truly unknown.

e. For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

### Item 11. Prenatal Care [PCARE]

Select **Yes** if the mother received any prenatal obstetrical care prior to the admission during which birth occurred. Note that one visit is counted as prenatal care.

Select **No** if the mother did not receive any prenatal obstetrical care.

Select **Unknown** if this information cannot be obtained.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

### Item 12. Group B Strep Positive [GROUPBSTREP]

Select **Yes** if a maternal vaginal or anal or urine culture is positive for Group B Streptococcus (GBS).

Select **No** if a maternal culture(s) for GBS was/were done (vaginal, anal or urine cultures) and was/were negative for Group B Streptococcus (GBS).

Select **Not Done** if a maternal culture for GBS (vaginal, anal or urine culture) was not performed.

Select **Unknown** if this information cannot be obtained.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

### Antenatal Steroid Therapy

### Item 13a. Antenatal Steroids Used [ASTER]

Select **Yes** if corticosteroids were administered IM or IV to the mother during pregnancy at any time prior to delivery. Corticosteroids include betamethasone, dexamethasone, and hydrocortisone.

Select **No** if antenatal corticosteroids were not administered to the mother during pregnancy at any time prior to delivery or if there is no documentation in the medical record that antenatal steroid therapy was initiated before delivery.

Select **Unknown** if this information cannot be obtained (e.g. missing records from a referring hospital).

Note:

a. For calculating the Joint Commission measure, "**Unknown**" will count as a "**No**."

b. For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 13b. Is there documentation in the medical record of reasons for NOT initiating antenatal steroid therapy before delivery? [ASTERDOCUMENT]

Select **Yes** if there is documentation by a physician/Advanced Practice Nurse/Physician's Assistant/Certified Nurse Midwife that the patient has one or more reasons for not initiating antenatal steroid therapy before delivery.

Select **No** if there is no documentation by physician/ Advanced Practice Nurse/Physician's Assistant/Certified Nurse Midwife of a reason for not initiating antenatal steroid therapy before delivery or unable to determine from medical record documentation.

Select **Unknown** if this information cannot be obtained.

Note:

a. The Joint Commission will exclude all cases marked as "Yes" from the numerator/denominator so there is advantage to find this documentation if present.

b. When determining whether there is a reason documented by a physician/ Advanced Practice Nurse/Physician's Assistant/Certified Nurse Midwife for not initiating antenatal steroid therapy, reasons must be explicitly documented (e.g., "patient had an adverse reaction to the medication - unable to initiate antenatal steroid therapy") or clearly implied (i.e., there is documentation the delivery occurred before antenatal steroid therapy could be initiated, or there is documentation the fetus has anomalies which are not compatible with life).

c. Starting from 2018, this item is only applicable and optional for inborn infants who are <34 weeks gestational age.

d. This item is Not Applicable (NA) if the infant was ≥ 34 weeks gestational age at birth or if the mother did receive antenatal steroids.

## Item 13c. What was the documented reason for NOT administering antenatal steroids? [ASTERREASON]

Select **Chorioamnionitis** if it includes infections of the amniotic sac and fluid (amnionitis) and those of the uterine wall (endometritis).

Select **Other active infection** if sepsis, pyelonephritis, active herpes or similar infection was given as the reason.

Select **Immediate delivery** if the mother is admitted with advanced cervical dilation or fetal/maternal condition requiring immediate delivery.

Select **Fetus has anomalies incompatible with life** if only comfort measures are to be provided.

Select **History of adverse reaction to corticosteroids** if the mother has a history of adverse reaction to corticosteroids.

Select **Comfort care** if infant is pre-viable and planning for non-resuscitation due to immaturity or congenital anomalies.

Select **Other** if there is another documented reason that does not fall into a category above.

Select **Unknown** if this information cannot be obtained.

Note:

a. This is an optional field and would only be used if your hospital has a high rate of excluded cases to understand why. The reason should be found in the same spot as Item 13b.

b. This item is Not Applicable (NA) if the infant was ≥ 34 weeks gestational age at birth or if the mother did receive antenatal steroids or if there was no documentation in the medical record as to why no antenatal steroids were given.

c. Starting from 2018, this item is only applicable and optional for inborn infants who are <34 weeks gestational age.

## Item 14. Spontaneous Labor [SPLABOR]

Labor is defined as the presence of strong, regular, and painful contractions causing cervical change.

Select **Yes** if the mother went into labor on her own (spontaneous labor). prior to delivery. Cases where the mother begins labor spontaneously, but the labor is subsequently augmented (e.g. administration of Pitocin) spontaneous labor should be checked **Yes**.

Select **No** if the mother did not go into labor on her own. Select **No** if labor is induced (e.g. administration of Pitocin or cervical ripening agent), but no labor was evident prior to induction. Select **No** if the patient had a scheduled cesarean delivery.

Select **Unknown** if this information cannot be obtained.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 15a. Multiple Gestation [MULT]

Select **Yes** if two or more live fetuses were documented at any time during pregnancy. Note that this count might include fetuses that have been re-absorbed in utero by the time of delivery.

Select **No** for a singleton birth.

Select **Unknown** if the information is not known.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 15b. If Multiple Gestation, Number of Infants Delivered [NBIRTHS]

If multiple gestation is answered Yes, enter the number of infants actually delivered. Count both live born and stillborn infants.

For example, if twins were delivered, enter "2"; if triplets were delivered enter "3". Do NOT count fetuses which have been reabsorbed in utero and were not delivered.

This item is Not Applicable (NA) if the infant is not a multiple gestation.

Select **Unknown** if the information is not known.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 15c. If Multiple Gestation, Birth Order among all Multiple Infants Delivered [BIRTHORDER]

If multiple gestation is answered Yes, enter the birth order of the infant for the set of multiples. For instance, if the infant was the second of a set of triplets delivered, enter 2. Note that it is necessary to answer items 14a and 14b before the on-line form lets you answer 14c. The reason is that this item should only be filled in if the infant was a multiple. Item 14b is then constrained to the number of multiples deliverd.

Select **Unknown** if the information is not known.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 16. Delivery Mode [DELMOD]

Select **Spontaneous Vaginal** for a Normal Vaginal delivery. This is any vaginal delivery for which instruments were not used. This includes cases where manual rotations or other head or shoulder maneuvers were used, provided instruments were not also used.

Select **Operative Vaginal** for any vaginal delivery for which any instrumentation (forceps, vacuum) was used. Episiotomies are not considered operative deliveries.

Select **Cesarean** for any abdominal delivery.

Select **Unknown** if this information cannot be obtained.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item 17a Maternal. Antenatal Maternal Conditions

This question focuses on antenatal events that may affect the pregnancy and/or delivery of the infant. Select all maternal conditions which were present in the antenatal period. Check None if none of the listed conditions was present. Check Unknown if the information is not obtainable.

Check **None** if no maternal antenatal conditions were pressent.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Hypertension [ANCMHYP]

Select **Yes** for **Hypertension** if the maternal or infant medical record states the diagnosis of hypertension, chronic or pregnancy-induced, eclampsia, preeclampsia, seizures, toxemia, HELLP syndrome, with or without edema and proteinuria, or if a maternal blood pressure above 140 systolic or 90 diastolic was recorded prior to or during the current pregnancy.

Select **No** if the mother did not have hypertension as outlined above.

Select **Unknown** if this information cannot be obtained.

## Chorioamnionitis [ANCMCHORIO]

Select **Yes** for **Chorioamnionitis** if the maternal medical record gives evidence of infections of the amniotic sac and fluid (amnionitis) and those of the uterine wall (endometritis).

Select **No** if the mother did not have chorioamnionitis as outlined above.

Select **Unknown** if this information cannot be obtained.

## Other Infection [ANCMOINF]

Select **Yes** for **Other Infection** if other maternal non-intrauterine infections which complicate the pregnancy or delivery. Includes Herpes, HIV, or other sexually transmitted diseases (STD) were present.

Select **No** if the mother did not have another infection as outlined above.

Select **Unknown** if this information cannot be obtained.

## Diabetes [ANCMDIA]

Select **Yes** for **Diabetes** if the maternal or infant medical record shows evidence of maternal diabetes of any type and severity.

Select **No** if the mother did not have diabetes as outlined above.

Select **Unknown** if this information cannot be obtained.

### Antenatal Magnesium Sulfate [ANCMAMAGSULF]

Select **Yes** if if **Magnesium Sulfate** was administered intravenously to the mother during pregnancy at any time prior to delivery for any reason.

Select **No** if Magnesium Sulfate was not administered intravenously to the mother during pregnancy at any time prior to delivery.

Select **Unknown** if this information cannot be obtained.

Note:

a. Enter this item such as it refers to the woman who delivered the infant even if she was a gestational carrier.

b. For the CPeTS form, this item is Not Applicable and grayed if the infant was transported from the ER, other non-perinatal setting or if this form pertains to a Safe Surrender situation.

### Previous Cesarean [ANCMCES]

Select **Yes** for **Previous cesarean** if the mother has delivered by cesarean prior to this delivery.

Select **No** if the mother did not have a previous cesarean section delivery.

Select **Unknown** if this information cannot be obtained.

### Other [ANCMOTH], [ANCMDESC]

Select **Yes** for **Other maternal** if another antenatal maternal complications affecting the infant's health or the course of delivery was diagnosed. Specify the complication in the space provided.

Select **No** if the mother did not have any other antenatal complications.

Select **Unknown** if this information cannot be obtained.

## Item 17b. Fetal Conditions

This question focuses on antenatal events that may affect the pregnancy and/or delivery of the infant. Select all fetal conditions which were present in the antenatal period. Check None if none of the listed conditions was present. Check Unknown if the information is not obtainable.

Check **None** if no fetal antenatal complications were present.

### IUGR [ANCFIUGR]

Select **Yes** for **Intrauterine growth restriction/IUGR** if symmetric or asymmetric IUGR was diagnosed.

Select **No** if symmetric or asymmetric IUGR was not diagnosed.

Select **Unknown** if this information is not obtainable.

### Non-reassuring Fetal Status [ANCFDIS]

Select **Yes** for **Non-reassuring Fetal Status** if the medical record states the diagnosis of fetal distress, poor biophysical profile, or non-reassuring (abnormal) stress test or fetal monitoring or fetal status. The following situations are also often associated with non-reassuring fetal status (but do not in themselves constitute non-reassuring fetal status, unless accompanied by documentation as noted above): decrease in amniotic fluid (low AFI, oligohydramnios), decreased blood flow or oxygenation to the infant, cord entanglement; cord prolapse, decreased fetal movement, fetal arrhythmia or fetal bradycardia.

Select **No** if the above was not diagnosed.

Select **Unknown** if this information is not obtainable.

### Anomaly [ANCFANO]

Select **Yes** for **Anomaly** if any anomalies were diagnosed prior to birth.

Select **No** if no anomalies were diagnosed prior to birth.

Select **Unknown** if this information is not obtainable.

### Other [ANCFOTH], [ANCFDESC]

Select **Yes** for **Other Fetal** if other fetal problems affecting the infant's health or the course of delivery were present. Specify the complication in the space provided.

Select **No** if no other fetal conditions affecting the infant's health or course of delivery were present.

Select **Unknown** if this information is not obtainable.

## Item 17c. Obstetrical Conditions

This question focuses on antenatal events that may affect the pregnancy and/or delivery of the infant. Select all obstetrical conditions which were present in the antenatal period. Check None if none of the listed conditions was present. Check Unknown if the information is not obtainable.

Check **None** if no obstetrical antenatal complications were present.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Preterm Labor [ANCOLABOR]

Select **Yes** for **Preterm (< 37 wks) Labor** if preterm (< 37 wks) regular contractions in the context of cervical change occurred.

Select **No** if preterm labor as outlined above did not occur.

Select **Unknown** if this information not obtainable.

## Preterm Premature ROM [ANCOPREPROM]

Select **Yes** for **Preterm (< 37 wks) Premature ROM** if premature rupture of membranes before the onset of labor prior to 37 weeks completed gestation occurred.

Select **No** if preterm premature ROM as outlined above did not occur.

Select **Unknown** if this information not obtainable.

Note:

Only one of "Preterm (< 37 wks) Premature ROM" or "Term (≥ 37 wks) Premature ROM" can apply.

## Premature ROM before onset of labor [ANCOPREROM]

Select **Yes** for **Term (≥ 37 wks) Premature ROM** if premature rupture of membranes before the onset of labor at 37 completed weeks or later occurred.

Select **No** if term premature ROM as outlined above did not occur.

Select **Unknown** if this information not obtainable.

Note:

a. Only one of "Preterm (< 37 wks) Premature ROM" or "Term (≥ 37 wks) Premature ROM" can apply.

b. "Term (≥ 37 wks) Premature ROM" is not applicable and grayed out if an infant was born prior to 37 completed weeks gestation.

## Prolonged ROM (>18 hours) [ANCOPROM]

Select **Yes** for **Prolonged ROM** if prolonged rupture of the membranes, rupture of the membranes more than 18 hours prior to birth of the infant, occurred.

Select **No** if prolonged ROM as outlined above did not occur.

Select **Unknown** if this information not obtainable.

## Malpresentation/Breech [ANCOMAL]

Select **Yes** for **Malpresentation / Breech** if the fetal presentation was other than vertex, including frank breech, footling breech, transverse and compound presentation.

Select **No** if the fetal presentation was vertex.

Select **Unknown** if this information not obtainable.

### Bleeding/Abruption/Previa [ANCOBLEED]

Select **Yes** for **Bleeding/Abruption/Previa** if bleeding occurred related to complications with the placenta. Placental abruption refers to premature detachment of the placenta from the uterine wall. Placenta previa refers to low implementation of the placenta in the uterus, usually over the cervix.

Select **No** if bleeding/abruption/previa as outlined above did not occur.

Select **Unknown** if this information not obtainable.

### Other [ANCOOTH], [ANCODESC]

Select **Yes** for **Other obstetrical complications** if any other obstetrical complication occurred. Specify the complication in the space provided.

Select **No** if no other obstetrical complications occurred.

Select **Unknown** if this information not obtainable.

## Item 18. Cesarean Section Indications

Indicate why a cesarean section was done. Select all indications that apply.

Check **Not Applicable** if no cesarean section was performed to deliver this infant.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

### Malpresentation/Breech [INDCESBR]

Select **Yes** for **Malpresentation/Breech** if the infant has an unfavorable presentation (breech, oblique, transverse, or compound lie).

Select **No** if unfavorable fetal presentation was not a reason for a cesarean section.

Select **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

### Multiple Gestation [INDCESMG]

Select **Yes** for **Multiple gestation** if a reason for cesarean delivery was a multiple gestation pregnancy.

Select **No** if a multiple gestation pregnancy was not a reason for a cesarean section.

Check **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

### Fetal Distress [INDCESFD]

Select **Yes** for **Non-reassuring Fetal Status** if non-reassuring fetal status was a reason why a cesarean section was performed.

Select **No** if non-reassuring fetal status was not a reason for a cesarean section.

Check **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

### Elective [INDCESER]

Select **Yes** for **Elective** if the cesarean section was elected over vaginal birth by physician or patient preference and no other indication is specified. Includes elective repeats.

Select **No** if the cesarean section was not performed electively.

Select **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

### Dystocia / Failure to Progress [INDCESDY]

Select **Yes** for **Dystocia/Failure to Progress** if a cesarean section was performed for either of the following reasons: (1) uterine contractions were insufficient to open the cervix; (2) the pelvis and/or birth canal was too small or was obstructed, preventing clear passage of the infant; (3) failure to progress. Also include as dystocia, cases of failed induction, unengaged fetus, cephalopelvic disproportion, and suspected or pending macrosomia.

Select **No** if dystocia/failure to progress was not a reason for a cesarean section.

Check **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

### Placental Problems [INDCESPP]

Select Yes for **Placental Problems** if problems related to the placenta indicated a cesarean section be performed. Includes placenta previa, antepartum bleeding, abruption.

Select **No** if placental problems as outlined above were not a reason for a cesarean section.

Check **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

### Hypertension [INDCESHTN]

Select Yes for **Hypertension** if hypertension was a reason why a cesarean section was performed. The medical record should state the diagnosis of hypertension, eclampsia, preeclampsia, seizures, toxemia or HELLP Syndrome.

Select **No** if hypertension as outlined above was not a reason for a cesarean section.

Select **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

### Other [INDCESOTH], [INDCESDESC]

Select **Yes** for **Other** and specify indication in the space provided if another maternal, fetal, or obstetrical problem was a reason why a cesarean section was performed.

Select **No** if no other reason for a cesarean section was present.

Check **Unknown** if either (a) the mode of delivery is unknown, or (b) a cesarean section was performed, but the reasons for choosing cesarean over vaginal delivery are not known.

## Delivery Room

### Delayed Cord Clamping

On October 15, 2015, the American Heart Association (AHA) and American Academy of Pediatrics released new 2015 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care of the Neonate. The guidelines serve as foundation for the Neonatal Resuscitation Program® (NRP®) 7th edition materials that will be released in Spring 2016 and must be in use by January 1, 2017.

The guidelines are based on a rigorous, 5-year, evidence-based topic review by the International Liaison Committee on Resuscitation (ILCOR), reflected in their Consensus on Science and Treatment Recommendations (CoSTR) also released on October 15, and represent thousands of hours of preparation, review, and oftentimes spirited debate. The NRP Steering Committee has prepared the following summary that highlights the major changes. The full ILCOR CoSTR and guidelines can be viewed online at eccguidelines.heart.org.

- "The 2015 ILCOR systematic review confirms that delayed cord clamping (DCC) is associated with less IVH of any grade, higher blood pressure and blood volume, less need for transfusion after birth, and less necrotizing enterocolitis..."
- "The only negative consequence appears to be a slightly increased level of bilirubin..."
- NRP Guidelines Update: Initial Steps of Newborn Care:

Current evidence suggests that cord clamping should be delayed for at least 30 to 60 seconds for most vigorous term and preterm newborns. If placental circulation is not intact, such as after a placental abruption, bleeding placenta previa, bleeding vasa previa, or cord avulsion, the cord should be clamped immediately after birth. There is insufficient evidence to recommend an approach to cord clamping for newborns who require resuscitation at birth.

As delayed cord clamping is being recommended now by international and national guidelines, quality improvement to implement delayed cord clamping may be warranted. Hence an assessment of the variation in DCC practice is helpful. The different impacts of delayed cord clamping (or milking) — whether beneficial (or harmful) is not fully established.

## Item 19a. Was delayed umbilical cord clamping performed? [DCCDONE]

Select **Yes** if delayed umbilical cord clamping was performed.

Select **No** if delayed umbilical cord clamping was not performed.

Select **Unknown** if this information cannot be obtained.

Note:

For the purposes of this definition, clamping performed less than 30 seconds after delivery would not be considered delayed cord clamping even if there was intention to perform delayed cord clamping.

## Item 19b. How long was umbilical cord clamping delayed? [DCCTIME]

Select **30 to 60 seconds** if delayed umbilical cord clamping was performed for 30 to 60 seconds.

Select **61 to 120 seconds** if delayed umbilical cord clamping was performed for 61 seconds to 120 seconds.

Select **> 120 seconds** if delayed umbilical cord clamping was performed for greater than 120 seconds.

If 19a is No, then **Not Applicable** will be automatically selected and this item will be grayed out.

Select **Unknown** if this information cannot be obtained.

## Item 19c. If DCC was not done, reason why [OPTIONAL]? [DCCNOTWHY], [DCCNOTWHYDESC]

Select **Maternal Bleeding** if delayed umbilical cord clamping was not performed due to abruption, placental separation, uterine rupture, cord avulsion.

Select **Neonatal Causes** if delayed umbilical cord clamping was not performed due to neonatal complications i.e very depressed apneic baby requiring resuscitation, hydropic.

Select **Other** if delayed umbilical cord clamping was not performed for reasons other than maternal bleeding and neonatal causes. Please enter a description if Other is selected in the space provided.

If 19a is Yes, then **Not Applicable** will be automatically selected and this item will be grayed out.

Select **Unknown** if this information cannot be obtained.

## Item 19d. Was umbilical cord milking performed? [DCCCORDMILK]

Select **Yes** if cord milking was performed.

Select **No** if cord milking was not performed.

Select **Unknown** if this information cannot be obtained.

Note:

Umbilical cord milking - The 2015 ILCOR review on umbilical cord milking states:

"In light of the limited information regard- ing the safety of rapid changes in blood volume for extremely pre- term infants, we suggest against the routine use of cord milking for infants born at less than 29 weeks of gestation outside of a research setting. Further study is warranted because cord milking may improve initial mean blood pressure and hematologic indices and reduce intracranial hemorrhage, but thus far there is no evidence for improvement in long-term outcomes."

Although this practice is not currently recommended, we recognize that some centers / clinicians are performing this related therapy. Therefore, we will also collect data on this practice.

### Item 19e. Did breathing begin before umbilical cord clamping? [DCCBREATH]

Select **Yes** if breathing began before umbilical cord clamping was performed. If the infant has signs of breathing, such as crying, chest wall movement, and/or grunting, select **Yes**.

Select **No** if breathing did not begin before umbilical cord clamping was performed.

Select **Unknown** if this information cannot be obtained.

### Item 20. APGAR Scores

### 1-Minute APGAR [AP1]

Enter the APGAR score at 1 minute as noted in the Labor and Delivery record, if available.

Check **Not Done** for if the 1-Minute APGAR score was not done.

Check **Unknown** if this information cannot be obtained.

### 5-Minute APGAR [AP5]

Enter the APGAR score at 5 minutes as noted in the Labor and Delivery record, if available.

Check **Not Done** for if the 5-Minute APGAR score was not done.

Check **Unknown** if this information cannot be obtained.

### 10-Minute APGAR [AP10]

Enter the APGAR score at 10 minutes as noted in the Labor and Delivery record, if available.

Check **Not Done** for if the 10-Minute APGAR score was not done.

Check **Unknown** if this information cannot be obtained.

## Perinatal Asphyxia

### Item 21a. Suspected Encephalopathy or Suspected Perinatal Asphyxia or Low 5-Min and/or 10-Min Apgar Score [PA]

*This item only applies to infants >1,500 grams.*

Select **Yes** if the infant had suspected encephalopathy or perinatal asphyxia along with cardiorespiratory depression at birth signified by a pH less than 7.00 on an umbilical blood sample or a blood gas obtained within one hour of life, or if the infant's 5-minute Apgar score was less than or equal to 3, or if the infant's 10-minute Apgar score of less than or equal to 4.

Select **No** if the infant does not meet any of the above criteria.

Select **Unknown** if this information cannot be obtained.

Note:

This definition of suspected encephalopathy or suspected perinatal asphyxia is different from the criteria for hypoxic ischemic encephalopathy (HIE), defined later in Item 51 (i.e., not all patients meeting eligibility criteria under suspected encephalopathy or suspected perinatal asphyxia will have HIE according to the HIE definition).

### Item 21b. Is an Umbilical Cord Blood Gas or a Baby Blood Gas in the First Hour of Life Available? [GAS]

*This item only applies to infants >1,500 grams who also meet at least one of the following criteria:*

- *admitted with suspected encephalopathy (Yes to Item 21a)*
- *admitted with suspected perinatal asphyxia (Yes to Item 21a),*
- *5-minute Apgar less than or equal to 3 or 10-minute Apgar less than or equal to 4 (Item 20),*
- *received active hypothermia (Selective or Whole Body Cooling to Item 24d), or*
- *diagnosis of HIE (Mild/Moderate/Severe to Item 51).*

Select **Yes** if an umbilical cord blood gas or a baby blood gas within the first hour of life was obtained. If yes, respond to items 21c-e.

Select **No** if an umbilical cord blood gas or a baby blood gas within the first hour of life was not obtained.

Select **Not Applicable** if this item does not apply.

Select **Unknown** if this information cannot be obtained.

Note:

The umbilical cord or the first baby blood gas value is important to identify these newborns as it is one of the eligibility criteria. The severity and the timing of the perinatal insult may be evident based on the pH and the base deficit in these newborns. All studies and recommendations related to therapeutic cooling have a physiological criteria based on pH and base deficit. Hence, collecting these values is important to compare outcomes of newborns with HIE whether they did or did not undergo therapeutic cooling.

## Item 21c. Source of the Blood Gas [GASSOURCE]

*This item only applies to infants >1,500 grams who also meet at least one of the following criteria:*

- *admitted with suspected encephalopathy (Yes to Item 21a)*
- *admitted with suspected perinatal asphyxia (Yes to Item 21a),*
- *5-minute Apgar less than or equal to 3 or 10-minute Apgar less than or equal to 4 (Item 20),*
- *received active hypothermia (Selective or Whole Body Cooling to Item 24d), or*
- *diagnosis of HIE (Mild/Moderate/Severe to Item 51).*

*and for whom an umbilical cord blood gas or baby blood gas during the first hour of life has been obtained (Yes to 21b).*

Select the source where the infant's blood gas was obtained. The umbilical arterial (UA) cord blood gas is preferred over the umbilical venous (UV) blood gas. Any umbilical cord gas (UA or UV) is preferred over any baby gas. If no cord blood gas is available, then use the first blood gas that was obtained from the baby within the first hour of life.

Select from the following options:

- Cord umbilical arterial (UA)
- Cord umbilical venous (UV)
- Arterial baby gas
- Venous baby gas
- Capillary baby gas

Select **Not Applicable** if this item does not apply.

Select **Unknown** if this information cannot be obtained.

## Item 21d. pH within 1 Hour of Life [GASPH]

*This item only applies to infants >1,500 grams who also meet at least one of the following criteria:*

- *admitted with suspected encephalopathy (Yes to Item 21a)*
- *admitted with suspected perinatal asphyxia (Yes to Item 21a),*
- *5-minute Apgar less than or equal to 3 or 10-minute Apgar less than or equal to 4 (Item 20),*
- *received active hypothermia (Selective or Whole Body Cooling to Item 24d), or*
- *diagnosis of HIE (Mild/Moderate/Severe to Item 51).*

*and for whom an umbilical cord blood gas or baby blood gas during the first hour of life has been obtained (Yes to 21c).*

Record the pH to 2 decimal places from the source listed in Item 21c.

If this item is not applicable, the data entry box is grayed.

Check the **Unknown** box if this information cannot be obtained.

### Item 21e. Base Deficit within 1 Hour of Life [GASBD]

*This item only applies to infants >1,500 grams who also meet at least one of the following criteria:*

- *admitted with suspected encephalopathy (Yes to Item 21a)*
- *admitted with suspected perinatal asphyxia (Yes to Item 21a),*
- *5-minute Apgar less than or equal to 3 or 10-minute Apgar less than or equal to 4 (Item 20),*
- *received active hypothermia (Selective or Whole Body Cooling to Item 24d), or*
- *diagnosis of HIE (Mild/Moderate/Severe to Item 51).*

*and for whom an umbilical cord blood gas or baby blood gas during the first hour of life has been obtained (Yes to 21c).*

Record the base deficit to 1 decimal place from the source listed in Item 21b.

If this item is not applicable, the data entry box is grayed.

Check the **Too Low to Register** box if the equipment indicates that the base deficit as too low to register or incalculable.

Check the **Unknown** box if this information cannot be obtained.

Note:

"Base deficit" is defined in reference to a negative integer, but written as a positive integer. However, some places use the equivalent term "base excess" which is written as a negative integer. Thus, a base excess of "-17.7" is equivalent to a base deficit of "17.7."

## Initial Resuscitation

In 2006, the description of the Delivery Room Resuscitation items (Item 22) has been modified to clarify that these interventions may be performed in the Delivery Room or in an Initial Resuscitation Area immediately following birth and prior to the admission to the NICU. There are situations in which infants receive their initial neonatal resuscitation in locations other than a "delivery room." These include cases in which birth occurs outside of a "delivery room" (home, automobile, ambulance, hospital room, antepartum unit, emergency room, etc.) and in cases in which resuscitation is provided in locations adjacent to or close-by the delivery room. In such situations, the responses to the Initial Resuscitation items should be based on the initial resuscitation provided immediately after birth, regardless of where the resuscitation took place. In such situations, the responses to Item 22. Delivery Room Resuscitation should be based on the initial resuscitation provided immediately after birth, regardless of where the resuscitation took place. The Initial Resuscitation Area is the term used below to indicate an area where stabilization occurs immediately after birth and prior to NICU admission, including the delivery room or other location where initial resuscitation and stabilization are performed.

## Item 22a. Initial Resuscitation -- Supplemental Oxygen [DROX]

Select **Yes** if infant received any **supplemental oxygen** in the delivery room or during the initial resuscitation performed immediately after birth.

Select **No** if infant did not receive supplemental oxygen in the delivery room or during the initial resuscitation performed immediately after birth.

Select **Unknown** if this information cannot be obtained.

## Item 22b. Initial Resuscitation -- Nasal CPAP [DRCPAP]

Select **Yes** if the infant was given **continuous positive airway pressure (CPAP)** in the delivery room. CPAP administered through a face mask covering the nose without the administration of intermittent breaths is considered nasal CPAP for the purpose of this definition. If this item is answered as "**Yes**" and the infant was admitted to your NICU, item 26b is applicable.

Select **No** if infant did not receive continuous positive airway pressure (CPAP) in the delivery room.

Select **Unknown** if this information cannot be obtained.

## Item 22c. Initial Resuscitation -- Endotrachael Tube Ventilation [DRET]

Select **Yes** if the infant was **ventilated using an endotracheal tube** in the delivery room or during the initial resuscitation performed immediately after birth.

Select **No** if the infant did not receive ventilation through an endotracheal tube in the delivery room or during the initial resuscitation performed immediately after birth. If an endotracheal tube was placed only for suctioning and assisted ventilation was not given through the tube, check No.

Select **Unknown** if this information cannot be obtained.

### Item 22d. Initial Resuscitation -- Cardiac Compression [DRCC]

Select **Yes** if **external cardiac massage** was given in the delivery room or during the initial resuscitation performed immediately after birth.

Select **No** if external cardiac massage was not given in the delivery room or during the initial resuscitation performed immediately after birth.

Select **Unknown** if this information cannot be obtained.

### Item 22e. Initial Resuscitation -- Face Mask Ventilation [DRBM]

Select **Yes** if the infant received any **positive pressure breaths with a bag and face mask** in the delivery room or during the initial resuscitation performed immediately after birth. Positive pressure may be administered using a resuscitation bag, T-piece, or other device that generates intermittent positive pressure.

Select **No** if the infant did not receive any positive pressure breaths with a bag and face mask in the delivery room or during the initial resuscitation performed immediately after birth. Select **No** if a bag, T-piece or face mask were only used to administer CPAP (continuous positive airway pressure) and no positive pressure breaths were given.

Select **Unknown** if this information cannot be obtained.

### Item 22f. Initial Resuscitation -- Epinephrine [DREP]

Select **Yes** if **epinephrine** was given in the delivery room or during the initial resuscitation performed immediately after birth via intravenous, intracardiac or intratracheal (through an endotracheal tube) routes.

Select **No** if epinephrine was not given in the delivery room or during the initial resuscitation performed immediately after birth via intravenous, intracardiac or intratracheal (through an endotracheal tube) routes.

Select **Unknown** if this information cannot be obtained.

### Item 22g. Initial Resuscitation -- Nasal Intermittent Positive Pressure Ventilation [DRNIPPV]

Select **Yes** if the infant was given **nasal intermittent positive pressure ventilation (NIPPV)** in the delivery room or during the initial resuscitation performed immediately after birth. Positive pressure breaths through nasal prongs may be administered using a resuscitation bag, T-piece, or other device that generates intermittent positive pressure breaths.

Select **No** if NIPPV was not used in the DR. Also select **No** if nasal prongs were only used to administer continuous positive airway pressure (CPAP) and no positive pressure breaths were given.

Select **Unknown** if this information cannot be obtained.

Note:

1. Nasal intermittent positive pressure ventilation (NIPPV) is **different** from bag/mask PPV.
2. The use of NIPPV implies the use of CPAP. Therefore, checking Initial Resuscitation NIPPV as Yes forces the response of item 22b. Initial Resuscitation CPAP to Yes.

### Item 22h. Initial Resuscitation -- Laryngeal Mask Airway (LMA) [DRLMA]

Select **Yes** if the infant received any **intermittent positive pressure breaths via a laryngeal mask airway** in the delivery room or during the initial resuscitation performed immediately after birth. Intermittent positive pressure breaths may be administered using an anesthesia bag, self-inflating bag, or other device that generates intermittent positive pressure.

Select **No** if the infant did not receive any intermittent positive pressure breaths via a laryngeal mask airway device in the delivery room or during the initial resuscitation performed immediately after birth. Select **No** if a laryngeal mask airway device was only used to administer continuous positive airway pressure and no intermittent positive pressure breaths were given.

Select **Unknown** if this information cannot be obtained.

## Surfactant

### Item 23a. Surfactant in the DR [DRSURF]

Select **Yes** if surfactant was administered to the infant in the delivery room or as part of the stabilization immediately after birth even if that occurred in a location other than the delivery room.

Select **No** if surfactant was not administered when the infant was in the delivery room or as part of the stabilization immediately after birth.

Select **Unknown** if this information cannot be obtained.

Note:

The initial resuscitation and stabilization of infants immediately after birth may occur in locations other than a delivery room. These may include a designated resuscitation area, hospital room, emergency room, operating room, ambulance, etc. If surfactant is administered during stabilization and resuscitation immediately following birth, the answer to this question is Yes regardless of location.

If the stabilization immediately after birth occurs in a delivery room, resuscitation room or other location and the infant is then transported to the NICU for further stabilization during which surfactant is administered, select No.

### Item 23b. Surfactant Given at Any Time [SURFX]

Select **Yes** if the infant received an exogenous surfactant at any time. If the answer to item Was Surfactant given in the Delivery Room? is Yes, the answer to this item is Yes.

Select **No** if the infant never received an exogenous surfactant.

Select **Unknown** if this information cannot be obtained.

### Item 23c. Age at First Surfactant Dose [SURF1DHR], [SURF1DMIN]

If item 23b. Was Surfacant given at any Time? has been answered yes, enter the age at the first dose in hours and minutes.

If item 23b. Was Surfacant given at any Time? has been answered no, this item is **Not Applicable**, and the field of the on-line form is grayed out.

Check **Unknown** if surfactant was given, however information on the age at the first surfactant dose cannot be obtained.

Note:

1. Starting from 2016, the DRD and A/D forms include the ability to enter the date/time of first surfactant treatment. If the date/time of birth is also provided, the time from birth to surfactant in hours and minutes is calculated and populates the respective form fields. The date/time of surfactant is **not** captured to the CPQCC data base.
2. Upon submission, the A/D form propagates the date/time of first surfactant treatment to the CPeTS form if the date/time of first surfactant treatment has not been entered on the CPeTS form, and if the date/time of first surfactant treatment occurred prior to an infant's NICU admission at the receiving NICU.

## Respiratory

### Temperature and Cooling

### Item 24a. Temperature Measured within One Hour of Admission to Your NICU [ATEMPM]

Select **Yes** if the infant's core body temperature was measured and recorded within the first hour after admission to your NICU. Core body temperature may be measured by taking a rectal, esophageal, tympanic or axillary temperature.

Select **No** if the infant's core body temperature was not measured and recorded within the first hour after admission to your NICU.

Select **Unknown** if this information cannot be obtained.

Note:

a. This item applies to the temperature of the infant during the first hour after admission to your NICU. For outborn infants, do not record temperature measurements taken at the transporting center.

b. If an attempt was made to measure temperature during the first hour after admission to your NICU, and the temperature of the infant was lower than what the thermometer could measure, Select 'Yes' and check 'Too low to register' in item 24b. If the infant's core body temperature was not measured within the first hour after admission to your NICU, item 24b. is not applicable.

c. For infants not undergoing cooling during the transport process, this item propagates the same variable in the CPeTS on-line form (Item C.21c at NICU admission).

## Item 24b. Temperature at Admission to Your NICU (in Degrees Centigrade to Nearest 10th of a Degree) [ATEMP]

If the infant's core body temperature was measured and recorded within the first hour of the **initial** admission to your NICU, enter the infant's temperature in degrees centigrade to the nearest tenth of a degree. If the infant's temperature is measured multiple times within the first hour after admission to your NICU, enter the value of the first temperature measurement.

Use rectal temperature or, if not available, esophageal temperature, tympanic temperature or axillary temperature, in that order.

Check **Too Low to Register** for situations in which the infant's temperature is too low to register on the thermometer used.

Temperatures may be entered in degrees Celsius or Fahrenheit.

Item 24b. applies to the first temperature measured within an hour of the initial admission to your NICU, even if the baby is being readmitted.

## Item 24c. Infant Cooling for HIE [ACOOLING]

Select **No Cooling for HIE** if no attempt for cooling / administration of hypothermic therapy for HIE was done at any time during the first admission to your NICU.

Select **Cooling for HIE Started** if the first attempt for cooling / administration of hypothermic therapy for HIE was started during the first admission to your NICU.

Select **Cooling for HIE Continued for Transport-in** if the first attempt for cooling / administration of hypothermic therapy for HIE was started at another hospital prior to admission to your NICU, and then continued during the first admission to your NICU. The option Cooling for HIE Continued for Transport-in is not applicable for inborn infants and will not be displayed on the on-line form for inborn infants.

Select **Unknown** if this information cannot be obtained.

Note:

Item 24c applies only to the first admission to your NICU. If the infant is transported out and re-admitted to your NICU, do not update this item.

### Item 24d. Type of LAST Hypothermic Therapy during NICU Admission [ACOOLINGMETHOD]

If an infant was cooled for HIE at any time during the initial admission to your NICU, record the last type of hypothermic therapy administered during the initial NICU admission.

Select **Passive** if cooling was intentionally withholding standard temperature maintenance strategies for the purpose of achieving low temperature. If passive cooling is only used until head or body cooling is started, please select either head or body cooling.

Select **Selective Head** if active cooling was restricted to the head and brain as an intervention to reduce the temperature by exposing the head to lower than environmental temperature. Specially designed head cooling devices, other cooling devices and ice packs applied to the head would be considered active cooling of the head and brain. Passive exposure to environmental temperature or cooling of the face for the treatment of supraventricular tachycardia is not considered active cooling of the head and brain.

Select **Whole Body** if active cooling of the body that is not restricted to the head and brain as an intervention to reduce the core body temperature and temperature of the brain by exposing the body to lower than environmental temperature. Whole body cooling may include cooling of the head in addition to the rest of the body. Cooling blankets, other cooling devices and ice packs applied to the body would be considered active cooling of the whole body. Passive exposure to environmental temperature is not considered active cooling of the whole body.

Select **Other** if cooling is actively administered in some other way that is not provided as an option.

Select **Unknown** if this information cannot be obtained.

Note:

a. If an infant is administered several methods of hypothermic therapy during the NICU admission, record the last type of hypothermic therapy administered during the first admission to your NICU.

b. Item 24d applies only to the first admission to your NICU. If the infant is transported out and re-admitted to your NICU, do not update this item.

c. This item is Not Applicable if the infant was not cooled.

## Respiratory Support after Initial Resuscitation

### Item 25a. Post DR Respiratory Support -- Supplemental Oxygen [OXY]

Select **Yes** if the infant was given supplemental oxygen at any time after leaving the delivery room or the Initial Resuscitation Area. Include this information even if it occurred at the birth hospital prior to transport to your center.

Select **No** if the infant was never given supplemental oxygen after leaving the delivery room or the initial resuscitation area.

Select **Unknown** if this information cannot be obtained.

Note:

21% oxygen is room air. This is not considered supplemental oxygen, no matter how administered.

## Item 25b. Post DR Respiratory Support -- Intubated Conventinal Ventilation [VENT]

Select **Yes** if the infant was given intermittent positive pressure ventilation through an endotracheal tube with a conventional ventilator (IMV rate <240/minute) at any time after leaving the delivery room or the Initial Resuscitation Area. Include this information even if it occurred at the birth hospital prior to transport to your center.

Select **No** if the infant was never given intermittent positive pressure ventilation through an endotracheal tube with a conventional ventilator (IMV rate<240/minute) after leaving the delivery room or the Initial Resuscitation Area.

Select **Unknown** if this information cannot be obtained.

Note:

Intermittent positive pressure ventilation (IPPV) via nasal prongs is NOT considered conventional ventilation. Synchronized intermittent positive pressure ventilation (SIMV) via nasal prongs is NOT considered conventional ventilation.

## Item 25c. Post DR Respiratory Support -- Intubated HIFI Ventilation [HFV]

Select **Yes** if the infant received intubated high frequency ventilation (IMV rate >240/minute) at any time after leaving the delivery room or the Initial Resuscitation Area. Include this information even if it occurred at the birth hospital prior to transport to your center.

Select **No** if the infant never received intubated high frequency ventilation (IMV rate >240/minute) after leaving the delivery room or the Initial Resuscitation Area.

Select **Unknown** if this information cannot be obtained.

Note:

Intubated High Frequency ventilation via nasal prongs is NOT considered intubated high frequency ventilation for this item.

## Item 25d. High Flow Nasal Cannula [HFNC]

Select **Yes** if the infant received air or oxygen (any $FiO_2$) at a flow rate of one liter per minute or more via nasal cannula at any time after leaving the delivery room or the Initial Resuscitation Area.

Select **No** if the infant did not receive air or oxygen (any $FiO_2$) at a flow rate of one liter per minute or more via nasal cannula at any time after leaving the delivery room or the Initial Resuscitation Area.

Select **Unknown** if this information cannot be obtained.

### Item 25e. Nasal IMV or SIMV (or any other form of non-intubated assisted ventilation) for greater than 4 hours. [NIMV]

Select **≤ 4 hours** if the infant received for 4 hours or less intermittent positive pressure ventilation (intermittent mandatory ventilation or synchronized intermittent mandatory ventilation) via nasal prongs or other nasal device at any time after leaving the delivery room or the Initial Resuscitation Area.

Select **> 4 hours** if the infant received for more than 4 hours intermittent positive pressure ventilation (intermittent mandatory ventilation or synchronized intermittent mandatory ventilation) via nasal prongs or other nasal device at any time after leaving the delivery room or the Initial Resuscitation Area.

Select **No** if the infant did not receive intermittent positive pressure ventilation via nasal prongs or other nasal device at any time after leaving the delivery room or the Initial Resuscitation Area.

Select **Unknown** if this information cannot be obtained.

Note:

a. Non-intubated assisted ventilation is defined as a mechanically-produced breath. CPAP alone DOES NOT qualify as non-intubated assisted ventilation. However, CPAP with a back-up rate whether administered through the nose, face mask, etc. that is triggered as a back-up rate or intermittently would qualify. In this case, select Yes to Nasal IMV/SIMV in Item 25e, but do not include these hours in calculating the duration of the initial episode of intubated assisted ventilation (Item 27b).

b. If a Big Baby infant is on CPAP with a back-up rate for greater than 4 continuous hours, then this infant qualifies under the Big Baby selection criteria of nasal IMV/SIMV (or any other form of non-intubated assisted ventilation) greater than 4 continuous hours.

c. This item should be coded "≤ 4 hours" or "> 4 hours" if the infant receives positive pressure patterns that include two or more levels of positive pressure such as "BiPAP" or "SiPAP."

d. Intermittent positive pressure ventilation (IPPV) via nasal prongs is NOT considered conventional ventilation.

e. Synchronized Intermittent positive pressure ventilation (SIMV) via nasal prongs is NOT considered conventional ventilation.

## Use of Nasal CPAP

### Item 26a. Nasal CPAP [CPAP]

Select **Yes** if the infant was given continuous positive airway pressure applied through the nose at any time after leaving the delivery room or the Initial Resuscitation Area.

Select **No** if the infant was never given continuous positive airway pressure applied through the nose after leaving the delivery room or the Initial Resuscitation Area.

Select **Unknown** if this information cannot be obtained.

Note:

a. If a Big Baby infant is on CPAP with a back-up rate for greater than four continuous hours, then this infant qualifies under the Big Baby selection criteria of Nasal IMV/SIMV (or any form of non-intubated assisted ventilation) greater than four continuous hours. CPAP alone does NOT qualify as non-intubated assisted ventilation.

b. High flow nasal cannula oxygen is NOT considered nasal CPAP for the purpose of this definition.

## Item 26b. Nasal CPAP or Nasal IMV or SIMV before or without ever having received ETT Ventilation [CPAPES]

Select **Yes** if the infant was given positive airway pressure applied through the nose at any time prior to first receiving intermittent positive pressure breaths through an endotracheal tube.

Select **Yes** if the infant was given positive airway pressure applied through the nose and never received intermittent positive pressure breaths through an endotracheal tube.

Select **No** if the infant received intermittent positive pressure breaths through an endotracheal tube before being given positive airway pressure applied through the nose.

Select **Not Applicable (NA)** if the infant never received positive airway pressure applied through the nose (No to 22b-Nasal CPAP at Initial Resuscitation and No to 26a-Nasal CPAP after Initial Resuscitation).

Select **Unknown** if this information cannot be obtained.

Note:

a. Item 26b is only completed when the answer to item 22b or item 26a is Yes. When responding to Item 26b, the important point is whether the Nasal CPAP or Nasal IMV or SIMV was given before or after assisted positive pressure breaths through an endotracheal tube.

b. If ETT Ventilation was never used, the response to Item 26b should be Yes.

c. "Intermittent positive pressure breaths" refers to assisted breaths given through an endotracheal tube using a mechanical ventilator or given through an endotracheal tube using an anesthesia bag, self-inflating bag, or other device.

d. CPAP administered through a face mask covering the nose without the administration of intermittent breaths is considered nasal CPAP for the purpose of this definition.

e. When responding to Nasal CPAP or Nasal Ventilation before or without ever having received ETT Ventilation, the important point is whether the Nasal CPAP or Ventilation was given at any time before assisted positive pressure breaths through an endotracheal tube were first given. The Nasal CPAP or Ventilation before assisted positive pressure breaths may have been given during initial resuscitation or after initial resuscitation.

f. There are two special situations that must be considered when answering this question:

   - If an infant was intubated in the initial resuscitation area solely for suctioning meconium, this does not count as prior intubation and assisted positive pressure breaths. Therefore, for infants whose only intubation prior to receiving Nasal CPAP or Ventilation was for suctioning of meconium, Nasal CPAP or Nasal Ventilation before or without ever having received ETT Ventilation should be answered **Yes.**

   - If an infant was intubated for the purpose of surfactant administration and rapidly extubated to Nasal CPAP or Ventilation, this does count as prior intubation and assisted positive pressure breaths. Nasal CPAP or Nasal Ventilation before or without ever having received ETT Ventilation should be answered **No**

g. Additional examples:

   - If an infant was first treated with Nasal CPAP and later was intubated and ventilated, the response to Item 26b should be Yes.

   - If an infant was treated with Nasal CPAP and was never subsequently intubated, the response to Item 26b should also be Yes.

   - If an infant was intubated and given intermittent positive pressure breaths through the endotracheal tube and then later received Nasal CPAP, the response to Item 26b should be No.

## Use of Intubated Assisted Ventilation

## Item 27a. Intubated Assisted Ventilation [DURVENT]

Select **None** if infant did not receive intubated assisted ventilation.

Select **Vent ≤ 4 hrs** if intubated assisted ventilation occurred for less than or equal to 4 continuous hours during the current admission. If Vent ≤ 4 hrs is selected, it is not necessary to report ventilation days.

Select **Vent > 4 hrs** if infant received intubated assisted ventilation for more than 4 continuous hours for any reason (surgery or the need for controlled sedation to perform imaging studies are included). Intubated assisted ventilation includes Intubated Conventional ventilation or Intubated High Frequency / Jet ventilation. Nasal IMV/SIMV (or any other form of non-intubated assisted ventilation) is NOT considered intubated assisted ventilation and should NOT be included in ventilation time for Item 27b. This item refers to assisted ventilation through an endotracheal tube only. CPAP alone should not be included in the length of time of intubated assisted ventilation for Item 27b.

Note:

a. The 2010 and later data collection no longer captures intubated assisted ventilation time as days and hours. Instead ventilation time in days only needs to be provided. The 2010 and later forms do have an entry field for the total number of hours ventilated for your convenience. You may enter the total number of hours ventilated. The number of hours entered will be converted to the correct number of days required for form completion.

b. In most cases this item pertains to the infant's initial episode of intubated assisted ventilation, during the initial stay at your hospital. However, for those infants who are ventilated for more than 4 hours, then transported out, and then readmitted while still ventilated, include the ventilation time at the transported to hospital as well. However, if this same infant is transported out and never readmitted, you only include the ventilation time at your hospital.

c. If the infant was transported into your center at the initial admission, do NOT include any prior ventilation episodes when assessing this item.

## Item 27b. Duration of Intubated Assisted Ventilation in Days [VENTDAYS]

If the duration of ventilation is > 4 hrs, enter the total ventilation time in days comprising the time when intubated assisted ventilation first began until ventilation was stopped for at least 24 hours.

Check **Unknown** if the number of days with intubated assisted ventilation cannot be determined.

Note:

a. The 2010 and later data collection no longer captures intubated assisted ventilation time as days and hours. Instead ventilation time in days only needs to be provided. The 2010 and later forms do have an entry field for the total number of hours ventilated for your convenience. You may enter the total number of hours ventilated. The number of hours entered will be converted to the correct number of days required for form completion.

b. In most cases this item pertains to the infant's initial episode of intubated assisted ventilation, during the initial stay at your hospital. However, for those infants who are ventilated for more than 4 hours, then transported out, and then readmitted while still ventilated, include the ventilation time at the transported to hospital as well. However, if this same infant is transported out and never readmitted, you only include the ventilation time at your hospital.

c. If the infant was transported into your center at the initial admission, do NOT include any prior ventilation episodes when assessing this item.

d. A failed or unsuccessful discontinuation of intubated assisted ventilation occurs when intubated assisted ventilation is discontinued, the infant does not tolerate this change, and intubated assisted ventilation is restarted within 24 hours.

   Example 1: Infant receives intubated assisted ventilation for 6 hours and is then weaned to NCPAP. The infant does not tolerate the change, and is placed back on intubated assisted ventilation 12 hours later at 18 hours of life. She remains on intubated assisted ventilation for the next 36 hours, and is then successfully weaned to NCPAP. - The duration of

intubated assisted ventilation is 2 days and 6 hours which should be entered as 3 days in the 2010 form.

Example 2: Infant receives intubated assisted ventilation for 6 hours and is then weaned to NCPAP. The infant does well for the next 36 hours, but then experiences a set-back and is re-intubated and placed back on intubated assisted ventilation. - The duration of intubated assisted ventilation is 0 days and 6 hours which should be entered as 1 day in the 2010 and later forms.

e. When recording ventilation days always round up.

   Example 3: An infant was ventilated for 4 hours 1 minute round up to 1 day.

   Example 4: An infant was ventilated for 25 hours 3 minutes round up to 2 days.

f. If an infant had multiple episodes of intubated assisted ventilation each lasting more than 4 hours, use the initial start and stop time of the first episode after which intubated assisted ventilation was not restarted within 24 hours when answering this item.

## Item 28. Infant Death within 12 Hours of NICU Admission [DIE12]

Select **Yes** if the infant died 12 hours or less from the time of admission to the NICU.

Select **No** if the infant did not die 12 hours or less from the time of admission to the NICU.

Select **Unknown** if this information cannot be obtained.

Note:

There may be eligible infants who die without ever having been admitted to your NICU. For eligible inborn infants who are never admitted to your NICU and who die within 12 hours of birth, use the Delivery Room Death Form rather than the Admission/Discharge Form. For eligible outborn infants who are never admitted to your NICU, check Yes to this Item if they die within 12 hours of admission to your hospital and complete all Items on the Admission/Discharge Form.

## Item 29. Respiratory Distress Syndrome [RDS]

Select **Yes** if the infant had Respiratory Distress Syndrome (RDS) defined as:

1. $PaO_2$ <50 mmHg in room air, central cyanosis in room air, or a requirement for supplemental oxygen to maintain $PaO_2$ >50 mmHg, or a requirement for supplemental oxygen to maintain a pulse oximeter saturation over 85% within the first 24 hours of life, AND

2. A chest radiograph consistent with RDS (reticulogranular appearance to lung fields with or without low lung volumes and air bronchograms) within the first 24 hours of life.

Select **No** if the infant did not satisfy both criteria 1 and 2 above.

Select **Unknown** if this information cannot be obtained.

## Item 30. Pneumothorax [PNTX]

Select **Yes, here** if the infant had extrapleural air diagnosed by chest radiograph or needle aspiration (thoracentesis) at YOUR hospital prior to Initial Disposition, and/or at YOUR hospital four (4) or more hours following readmission after initial transport. This includes infants who had thoracic surgery and then later developed extrapleural air diagnosed by CXR or needle thoracentesis.

Select **Yes, elsewhere** if the infant had extrapleural air diagnosed by chest radiograph or needle aspiration (thoracentesis) that occurred within four (4) hours of admission to your hospital and the infant was at another hospital before being admitted to your hospital, and/or at the hospital where the infant was initially transported if the infant was initially transported and then readmitted to your hospital after initial transport. This includes infants who had thoracic surgery who later developed extrapleural air diagnosed by CXR or needle thoracentesis.

Select **Yes, here and elsewhere** if the infant had extrapleural air diagnosed by chest radiograph or needle aspiration (thoracentesis) at BOTH your hospital AND another hospital. This includes infants who had thoracic surgery who later developed extrapleural air diagnosed by CXR or needle thoracentesis.

Select **No** if the infant did not have extrapleural air as defined above. For infants who had thoracic surgery and a chest tube was placed at the time of surgery, or if free air was only present on a CXR taken immediately after thoracic surgery and the infant was not treated with a chest tube, check No.

Select **Unknown** if this information cannot be obtained.

Note:

The on-line form will only display options that are possible depending on the responses to other items. For instance, for an inborn infant discharged home, the options "Elsewhere" and "Here and Elsewhere" will not be available.

## Item 31. Meconium Aspiration Syndrome [MECONIUM]

*For CPQCC centers that participate in the expanded VON data collection, this item applies to delivery room deaths and NICU admissions. For CPQCC centers that do not participate in the expanded VON data collection, this item applies to NICU admissions only.*

Select **Yes** if all five of the following criteria are satisfied:

1. Presence of meconium-stained amniotic fluid at birth.
2. Respiratory distress with onset within 1 hour of birth. Respiratory distress will be defined as the presence of one of the following signs: tachypnea, grunting, nasal flaring or intercostal retractions.
3. A $PaO_2$ <50 mmHg in room air, central cyanosis in room air or a requirement for supplemental oxygen to maintain $PaO_2$ >50 mmHg.
4. Abnormal chest x-ray compatible with the diagnosis of meconium aspiration. Findings may include coarse, irregular, or nodular pulmonary densities, areas of diminished aeration or consolidation alternating with areas of hyperinflation, and generalized hyperinflation.

5. Absence of culture-proven early onset bacterial sepsis or pneumonia. The diagnosis of culture-proven, early-onset, bacterial sepsis or pneumonia requires a positive blood culture obtained within 72 hours of birth.

Select **No** if all of the above criteria for Meconium Aspiration Syndrome do not apply.

Select **Unknown** if this information cannot be obtained.

### Tracheal Suctioning for Meconium Attempted during Initial Resuscitation [TRCSUCMA]

*This item applies only for CPQCC centers that participate in the expanded VON data collection.*

This item is applicable to all infants diagnosed with Meconium Aspiration Syndrome, including infants who meet the delivery room death criteria.

If Meconium Aspiration Syndrome was diagnosed, select **Yes** if tracheal suctioning through an endotracheal tube or suction catheter in the trachea was performed in the delivery room or initial resuscitation area in an attempt to remove meconium. If suctioning was performed, the answer is **Yes** even if no meconium was recovered.

Select **No** if Meconium Aspiration Syndrome was diagnosed and tracheal suctioning was not attempted during initial resuscitation.

Select **Not Applicable** if Meconium Aspiration Syndrome was not diagnosed.

Select **Unknown** if this information cannot be obtained.

### Item 32. Caffeine for Any Reason [CAFFEINE]

Select **Yes** if caffeine was administered at any time after birth for any reason.

Select **No** if caffeine was not administered at any time after birth for any reason.

Select **Unknown** if this information cannot be obtained.

### Item 33. Intramuscular Vitamin A for Any Reason [VITAMINA]

Select **Yes** if intramuscular vitamin A was administered at any time after birth for any reason.

Select **No** if intramuscular vitamin A was not administered at any time after birth for any reason.

Select **Unknown** if this information cannot be obtained.

### Item 34. Inhaled Nitric Oxide > 4 Hours [NITRICO]

Select **Yes, Here** if infant received Inhaled Nitric Oxide (iNO) > 4 hours

- at YOUR hospital prior to Initial Disposition, and/or
- at YOUR hospital following readmission after initial transport.

Select **Yes, Elsewhere** if infant received Inhaled Nitric Oxide (iNO) > 4 hours

- at another hospital before being admitted to your hospital, and/or
- at the hospital where the infant was initially transported, if the infant was initially transported and then readmitted to your hospital after initial transport.

Select **Yes, Here and Elsewhere** if infant received Inhaled Nitric Oxide (iNO) > 4 hours BOTH at your hospital AND another hospital as defined above.

Select **No** if infant did not receive Inhaled Nitric Oxide (iNO) > 4 hours during this admission or during transport from a referring hospital or prior to admission at another hospital.

Select **Unknown** if this information cannot be obtained.

Note:

The on-line form will only display options that are possible depending on the responses to other items. For instance, for an inborn infant discharged home, the options "Yes, elsewhere" and "Yes, here and elsewhere" will not be available.

### Item 35. ECMO [ECMO]

Select **Yes, Here** if infant received Extra-Corporeal Membrane Oxygenation (ECMO) at your hospital.

Select **Yes, Elsewhere** if infant received ECMO at another hospital.

Select **Yes, Here and Elsewhere** if infant received ECMO at BOTH your hospital and another hospital.

Select **No** if infant did not receive ECMO.

Select **Unknown** if this information cannot be obtained.

Note:

The on-line form will only display options that are possible depending on the responses to other items. For instance, for an inborn infant discharged home, the options "Elsewhere" and "Here and Elsewhere" will not be available.

## Postnatal Steroids

### Item 36a. Postnatal Steroid Treatment [POSTSTER]

Select **Yes** if postnatal systemic corticosteroids were given after birth. Do not include inhaled or topical steroids.

Select **No** if no postnatal systemic corticosteroids were given after birth.

Select **Unknown** if it is not known whether postnatal systemic corticosteroids were given after birth.

Note:

Inhaled corticosteroids are not considered systemic corticosteroids. Thus, if an infant received inhaled corticosteroids but did not receive systemic corticosteroids after birth to treat or prevent bronchopulmonary dysplasia or chronic lung disease, then the answer to this item is No.

## Item 36b. Reasons for Postnatal Steroid Treatment

If postnatal systemic corticosteroids were given, check all indications for steroid treatment that applied.

## CLD Reason for Postnatal Steroid Treatment [POSTERCLD]

Select **Yes, here** if steroids were administered to treat or prevent bronchopulmonary dysplasia (BPD) or chronic lung disease:

- at YOUR hospital prior to Initial Disposition, and/or
- at YOUR hospital following readmission after initial transport.

Select **Yes, elsewhere** if steroids were administered to treat or prevent bronchopulmonary dysplasia (BPD) or chronic lung disease:

- at another hospital before being admitted to your hospital, and/or
- at the hospital where the infant was initially transported, if the infant was initially transported and then readmitted to your hospital after initial transport.

Select **Yes, here and elsewhere** if steroids were administered to treat or prevent bronchopulmonary dysplasia (BPD) or chronic lung disease BOTH at your AND at another hospital.

Select **No** if steroids were not administered to specifically treat or prevent bronchopulmonary dysplasia (BPD) or chronic lung disease.

Select **Unknown** if this information cannot be obtained.

Note:

The on-line form will only display options that are possible depending on the responses to other items. For instance, for an inborn infant discharged home, the options "Elsewhere" and "Here and Elsewhere" will not be available.

## Blood Pressure Reason for Postnatal Steroid Treatment [POSTERBP]

Select **Yes** if steroids were given to treat hypotension.

Select **No** if steroids were not specifically given to treat hypotension.

Select **Unknown** if it is unknown whether steroids were given to treat hypotension.

## Extubation Reason for Postnatal Steroid Treatment [POSTEREX]

Select **Yes** if steroids were given to ease trauma or irritation to the endotracheal tube (e.g. glottic edema).

Select **No** if steroids were not specifically given to ease trauma or irritation to the endotracheal tube.

Select **Unknown** if it is unknown whether steroids were given to ease trauma or irritation to the endotracheal tube.

## Other Reason for Postnatal Steroid Treatment [POSTEROTH]

Select **Yes** if systemic steroids were given for reasons other than those listed above. Exclude inhaled or topical steroids.

Select **No** if steroids were not specifically given for reasons other than those listed above.

Select **Unknown** if it is unknown whether steroids were given for reasons other than CLD, extubation or hypotension/blood pressure.

## Item 37. Supplemental Oxygen on Day 28 [NEWOX28]

Select **Continuous** if the infant was hospitalized and received continuous supplemental oxygen on day 28. This does not include "blow-by" oxygen.

Select **Intermittent** if the infant was hospitalized and received any supplemental oxygen on day 28, but did not receive continuous oxygen during that day. Examples include oxygen given only with feeds or occasional apneic spells. "Blow-by" oxygen qualifies as intermittent supplemental oxygen.

Select **None** if the infant was hospitalized on day 28 and did not receive supplemental oxygen on that date.

Select **Not Applicable** if (a) if the infant is discharged home or dies prior to the Date of Day 28, or (b) if the infant is transported from your center to another hospital prior to the Date of Day 28 and either, is NOT readmitted to your center before discharge home, death or first birthday, OR is transported a second time before the Date of Day 28.

Select **Unknown** if this information cannot be obtained.

Note:

The date of Day 28 is determined by using the calendar date of birth as day 1 regardless of the time of birth. Thus for an infant born at 11:59 PM on September 1, Day 28 occurs on September 28. The date of Day 28 is calculated as Date of Birth plus 27 days. The on-line form figures out whether oxygen on the date of Day 28 is applicable and what it is based on the information entered for infant birth date, initial disposition, post-transport disposition, initial length of stay and total length of stay.

## Respiratory Support on the Day of Week 36 Adjusted Gestational Age

For the following items pertaining to respiratory support methods at 36 weeks adjusted gestational age, the on-line form determines the date of Week 36 Adjusted Gestational Age is based on the

information entered for gestational age at birth, infant birth date, initial disposition, post-transport disposition, initial length of stay and total length of stay. If based on the information entered, respiratory support methods at 36 weeks adjusted gestational age are not applicable, the form sets all items in this section to Not Applicable.

If none of the respiratory support methods listed below were used at 36 weeks adjusted gestational age, check **None**.

## Item 38a. Supplemental Oxygen on the Day of Week 36 Adjusted Gestational Age [OX36]

Select **Continuous** if the infant was hospitalized and received 4 or more hours of continuous supplemental oxygen on the date of week 36 adjusted gestational age. This does not include "blow-by" oxygen.

Select **Intermittent** if the infant was hospitalized and received any supplemental oxygen on the date of week 36, but did not receive continuous oxygen during that day. Examples include oxygen given only with feeds or occasional apneic spells. "Blow-by" oxygen qualifies as intermittent supplemental oxygen.

Select **None** if the infant was hospitalized on the date of week 36 and did not receive supplemental oxygen on that date.

Select **Not Applicable** if a) the infant's gestational age in rounded weeks is greater than 36 weeks; OR b) the infant is discharged home or dies prior to the Date of Week 36; OR c) the infant is transported from your center to another hospital prior to the Date of Week 36 and either is NOT readmitted to your center before discharge home, death or first birthday, or is transported a second time before the Date of Week 36.

Select **Unknown** if this information cannot be obtained.

## Item 38b. Conventional Ventilation on the Day of Week 36 Adjusted Gestational Age [VENT36]

Select **Yes** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant was given intermittent positive pressure ventilation through an endotracheal tube with a conventional ventilator (IMV rate <240/minute) at any time on the date of week 36.

Select **No** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant was not given intermittent positive pressure ventilation through an endotracheal tube with a conventional ventilator (IMV rate < 240/minute) at any time on the date of week 36.

Select **Not Applicable** if a) the infant's gestational age in rounded weeks is greater than 36 weeks; OR b) the infant is discharged home or dies prior to the Date of Week 36; OR c) the infant is transported from your center to another hospital prior to the Date of Week 36 and either is NOT readmitted to your center before discharge home, death or first birthday, or is transported a second time before the Date of Week 36.

Select **Unknown** if this information cannot be obtained.

Note:

Intermittent positive pressure ventilation (IPPV) via nasal prongs is not considered conventional ventilation. Synchronized intermittent positive pressure ventilation (SIMV) via nasal prongs is not considered conventional ventilation.

## Item 38c. High Frequency Ventilation on the Day of Week 36 Adjusted Gestational Age [HFV36]

Select **Yes** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant received high frequency ventilation (IMV rate >= 240/minute) at any time on the date of week 36.

Select **No** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant did not receive high frequency ventilation (IMV rate >= 240/minute) at any time on the date of week 36.

Select **Not Applicable** if a) the infant's gestational age in rounded weeks is greater than 36 weeks; OR b) the infant is discharged home or dies prior to the Date of Week 36; OR c) the infant is transported from your center to another hospital prior to the Date of Week 36 and either is NOT readmitted to your center before discharge home, death or first birthday, or is transported a second time before the Date of Week 36.

Select **Unknown** if this information cannot be obtained.

Note:

High frequency ventilation via nasal prongs is not considered high frequency ventilation.

## Item 38d. High Flow Nasal Cannula on the Day of Week 36 Adjusted Gestational Age [HFNC36]

Select **Yes** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant received air or oxygen (any FiO2) at a flow rate of one liter per minute or more via nasal cannula at any time on the date of week 36. Select **No** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant did not receive air or oxygen (any FiO2) at a flow rate of one liter per minute or more via nasal cannula at any time on the date of week 36.

Select **Not Applicable** if a) the infant's gestational age in rounded weeks is greater than 36 weeks; OR b) the infant is discharged home or dies prior to the Date of Week 36; OR c) the infant is transported from your center to another hospital prior to the Date

of Week 36 and either is NOT readmitted to your center before discharge home, death or first birthday, or is transported a second time before the Date of Week 36.

Select **Unknown** if this information cannot be obtained.

## Item 38e. Nasal IMV or SIMV on the Day of Week 36 Adjusted Gestational Age [NIMV36]

Select **Yes** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant received intermittent positive pressure ventilation (intermittent mandatory ventilation or synchronized intermittent mandatory ventilation) via nasal prongs or other nasal device at any time on the date of week 36.

Select **No** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant did not receive intermittent positive pressure ventilation via nasal prongs or other nasal device at any time on the date of week 36.

Select **Not Applicable** if a) the infant's gestational age in rounded weeks is greater than 36 weeks; OR b) the infant is discharged home or dies prior to the Date of Week 36; OR c) the infant is transported from your center to another hospital prior to the Date of Week 36 and either is NOT readmitted to your center before discharge home, death or first birthday, or is transported a second time before the Date of Week 36.

Select **Unknown** if this information cannot be obtained.

Note:

Nasal IMV or Nasal SIMV should be coded "Yes" if the infant receives positive pressure patterns that include two or more levels of positive pressure such as "BiPAP" or "SiPAP." Intermittent positive pressure ventilation (IPPV) via nasal prongs is not considered conventional ventilation. Synchronized intermittent positive pressure ventilation (SIMV) via nasal prongs is not considered conventional ventilation.

## Item 38f. CPAP on the Day of Week 36 Adjusted Gestational Age [CPAP36]

Select **Yes** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant was given continuous positive airway pressure applied through the nose at any time on the date of week 36. If Nasal IMV or Nasal SIMV at 36 weeks adjusted gestational age is answered "Yes," Nasal CPAP at 36 weeks adjusted gestational age should also be answered "Yes."

Select **No** if the item is applicable based on the Eligibility Criteria for Respiratory Support at 36 Weeks, and the infant was never given continuous positive airway pressure applied through the nose on the date of week 36.

Select **Not Applicable** if a) the infant's gestational age in rounded weeks is greater than 36 weeks; OR b) the infant is discharged home or dies prior to the Date of Week 36; OR c) the infant is transported from your center to another hospital prior to the Date of Week 36 and either is NOT readmitted to your center before discharge home, death or first birthday, or is transported a second time before the Date of Week 36.

Select **Unknown** if this information cannot be obtained.

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.

## Respiratory Monitoring and Support Devices at Discharge

When completing the respiratory support and monitoring at discharge items, "Discharge" refers to initial disposition in most cases. If an infant is transported from your center to another hospital and readmitted to your center following transport, update these items based on whether the infant was on respiratory support at the time of discharge after readmission.

Note:

Data entered for respiratory support at discharge are ignored and not committed to the NICU Database if the initial disposition has not been entered.

## Item 39a. Apnea or Cardio-Respiratory Monitor at Discharge [ACFINAL]

For infants who went home or were transported, select **Yes** if the infant was discharged on an Apnea Monitor or Cardio-Respiratory Monitor.

Select **No** if the infant was not discharged on an Apnea or Cardio-Respiratory Monitor.

Select **Unknown** if this information cannot be obtained.

For infants who remained in your Center on his/her first birthday, check **Yes** if the infant was on an Apnea Monitor or Cardio-Respiratory Monitor on the date of the infant's first birthday.

Select **No** if the infant was not on an Apnea or Cardio-Respiratory Monitor on his/her first birthday.

Select **Unknown** if this information cannot be obtained.

For infants who die prior to discharge, check **Yes** if infant was on an Apnea Monitor or Cardio-Respiratory Monitor at any time on the day of death.

Select **No** if the infant was not on an Apnea or Cardio-Respiratory Monitor at any time on the day of death.

Select **Unknown** if this information cannot be obtained.

Note:

A pulse oximeter is considered a cardio-respiratory monitor.

## Item 39b. Supplemental Oxygen at Discharge [OXFINAL]

For infants who went home or were transported, select **Yes** if the infant was discharged on supplemental oxygen.

Select **No** if the infant was not discharged on supplemental oxygen.

Select **Unknown** if this information cannot be obtained.

For infants who remained in your Center on their first birthday, select **Yes** if the infant was on supplemental oxygen on the date of the infant's first birthday.

Select **No** if the infant was not on supplemental oxygen on his/her first birthday.

For infants who died prior to discharge, select **Yes** if the infant received supplemental oxygen at any time on the day of death.

Select **No** if the infant did not receive supplemental oxygen at any time on the day of death.

Note:

21% oxygen is room air. This is not considered supplemental oxygen, no matter how administered.

## Item 39c. Conventional Ventilation at Discharge [VENTFINAL]

Select **Yes** if the infant went home or was transferred on intermittent positive pressure ventilation through an endotracheal tube with a conventional ventilator (IMV rate <240/minute).

Select **No** if the infant was not discharged on intermittent positive pressure ventilation through an endotracheal tube with a conventional ventilator (IMV rate <240/minute).

Select **Unknown** if this information cannot be obtained.

Note:

a. For an infant who died prior to discharge, select **Yes** if the infant received conventional ventilation at any time on the day of death.

b. Answer **No** if the infant did not receive conventional ventilation at any time on the day of death.

c. Intermittent positive pressure ventilation (Nasal IMV) via nasal prongs is not considered conventional ventilation.

d. Synchronized intermittent positive pressure ventilation (SIMV) via nasal prongs is not considered conventional ventilation.

## Item 39d. High Frequency Ventilation at Discharge [HFVFINAL]

Select **Yes** if the infant went home or was transferred on high frequency ventilation (IMV rate = 240/minute).

Select **No** if infant was not discharged on high frequency ventilation (IMV rate = 240/minute).

Select **Unknown** if this information cannot be obtained.

Note:

a. For an infant who died prior to discharge, select **Yes** if the infant received high frequency ventilation at any time on the day of death.

b. Select **No** if the infant did not receive high frequency ventilation at any time on the day of death.

c. High frequency ventilation via nasal prongs is not considered high frequency ventilation.

## Item 39e. High Flow Nasal Cannula at Discharge [HFNCFINAL]

Select **Yes** if the infant went home or was transferred on air or oxygen (any $FiO_2$) at a flow rate of one liter per minute or more via nasal cannula.

Select **No** if the infant was not discharged on air or oxygen (any $FiO_2$) at a flow rate of one liter per minute or more via nasal cannula.

Select **Unknown** if this information cannot be obtained.

Note:

a. For an infant who died prior to discharge, select **Yes** if the infant received air or oxygen (any $FiO_2$) at a flow rate of one liter per minute or more via nasal cannula at any time on the day of death.

b. Select **No** if the infant did not receive air or oxygen (any $FiO_2$) at a flow rate of one liter per minute or more via nasal cannula at any time on the day of death.

c. High frequency ventilation via nasal prongs is not considered high frequency ventilation.

## Item 39f. NIMV or SIMV at Discharge [NIMVFINAL]

Select **Yes** if the infant went home or was transferred on noninvasive positive pressure ventilation via nasal prongs or other nasal device.

Select **No** if the infant was not discharged on noninvasive positive pressure ventilation via nasal prongs or other nasal device.

Select **Unknown** if this information cannot be obtained.

Note:

a. For an infant who died prior to discharge, select **Yes** if the infant received noninvasive positive pressure ventilation via nasal prongs or other nasal device at any time on the day of death.

b. Select **No** if the infant did not receive noninvasive positive pressure ventilation via nasal prongs or other nasal device at any time on the day of death.

c. Nasal IMV or SIMV includes the following types of non-invasive positive pressure ventilation via nasal prongs:

    - Two or more levels of positive pressure such as BiPAP or SiPAP
    - Synchronized or unsynchronized intermittent mandatory ventilation
    - Noninvasive high-frequency oscillation

## Item 39g. Nasal CPAP at Discharge [CPAPFINAL]

Select **Yes** if the infant went home or was transferred on continuous positive airway pressure applied through the nose.

Select **No** if the infant was not discharged on continuous positive airway pressure applied through the nose.

Select **Unknown** if this information cannot be obtained.

Note:

a. For an infant who died prior to discharge, select **Yes** if the infant received continuous positive airway pressure applied through the nose at any time on the day of death.

b. Select **No** if the infant did not receive continuous positive airway pressure applied through the nose at any time on the day of death.

c. CPAP administered through a face mask covering the nose without the administration of intermittent breaths is considered nasal CPAP for the purpose of this definition.

d. High flow nasal cannula oxygen is not considered nasal CPAP for the purpose of this definition.

## Infections

### Item 40. Early Infections (on or before DOL 3)

### Early Bacterial Sepsis and/or Meningitis (on or before day 3) [EBSEPS]

Select **Yes** if a bacterial pathogen from the Bacterial Pathogens List (see next item) was recovered from a blood and/or cerebrospinal fluid culture obtained on day 1, 2, or 3 of life.

Select **No** if a bacterial pathogen from the Bacterial Pathogens List was not recovered from a blood culture or cerebrospinal fluid culture obtained on day 1, 2, or 3 of life, or if no blood or cerebrospinal fluid cultures were obtained on day 1, 2, or 3 of life.

Select **Unknown** if this information cannot be obtained.

Note:

a. The date of birth counts as day 1 regardless of the time of birth. For an infant born at 11:59 PM on September 1, day 3 will be September 3rd.

b. If an infant transports into your center, who is being treated for early bacterial sepsis because of a positive culture drawn at the referring hospital, this infant qualifies, even if a repeat culture drawn at your center is negative. However,if an infant transports into your center who was diagnosed with early sepsis but is no longer septic (due to treatment at the referring hospital), this infant does not qualify.

c. The on-line form figures out the date of day 3 and displays it on the form based on the information entered for infant birth date.

### Pathogen Codes for Early Bacterial Sepsis and/or Meningitis (on or before day 3) [EBSEPSCD1-EBSEPSCD3], [EBSEPSDESC]

If a bacterial pathogen was recovered from a blood and/or cerebrospinal fluid culture obtained on day 1, 2, or 3 of life, select up to three pathogens that were recovered from the **Bacterial Infection Pathogens List** below. If the pathogen recovered is not on the list, select the option Other and use the description box to describe the pathogen.

To ensure that this item reflects true early onset sepsis cases, please have an infection specialist at your NICU review each case especially regarding the use of the "Other" category. Use of the "Other" early infection category should account for roughly 1% of early infections coded.

| Code | Description |
|---|---|
| 101 | Achromobacter species |
| 102 | Acinetobacter species including multidrug-resistant Acinetobacter |
| 103 | Aeromonas species |
| 104 | Alcaligenes species [A. xylosoxidans and others] |
| 201 | Bacteroides species |
| 202 | Burkholderia species [B. capecia and others] |
| 301 | Campylobacter species [C. fetus, C. jejuni and others] including drugresistant Campylobacter |
| 302 | Chryseobacterium species |
| 303 | Citrobacter species [C. diversus, C. freundii, C. koseri and others] |
| 304 | Clostridium species |
| 501 | Enterobacter species [E. aerogenes, E. cloacae, and others] including Carbapenem-resistant Enterobacter |
| 502 | Enterococcus species [E. faecalis (also known as Streptococcus faecalis), E. faecium, and others] including Vancomycin-resistant Enterococcus |
| 503 | Escherichia coli including Carbapenem-resistant Escherichia coli |

| Code | Description |
|---|---|
| 601 | Flavobacterium species |
| 801 | Haemophilus species [H. influenzae and others] |
| 1101 | Klebsiella species [K. oxytoca, K. pneumoniae and others] including Carbapenem-resistant Klebsiella and Cephalosporin-resistant Klebsiella |
| 1201 | Listeria monocytogenes |
| 1301 | Moraxella species [M. catarrhalis (also known as Branhamella catarrhalis) and others] |
| 1302 | Morganella morganii |
| 1401 | Neisseria species [N. meningitidis, N. gonorrhoeae and others] including drug- resistant N. gonorrhoeae |
| 1601 | Pantoea |
| 1602 | Pasteurella species |
| 1603 | Prevotella species |
| 1604 | Proteus species [P. mirabilis, P. vulgaris and others] |
| 1605 | Providencia species [P. rettgeri and others] |
| 1606 | Pseudomonas species [P. aeruginosa and others] including multidrugresistant Pseudomonas aeruginosa |
| 1801 | Ralstonia species |
| 1901 | Salmonella species including drug-resistant Salmonella serotype Typhi |
| 1902 | Serratia species [S. liquefaciens, S. marcescens and others] |

| Code | Description |
|---|---|
| 1903 | Staphylococcus coagulase positive [aureus] including Methicillinresistant Staphylococcus aureus and Vancomycin-resistant Staphylococcus aureus |
| 1904 | Stenotrophomonas maltophilia |
| 1905 | Group B Streptococcus or GBS [also known as Streptococcus agalactiae] |
| 1906 | Streptococcus anginosus [formerly Streptococcus milleri] |
| 1907 | Streptococcus pneumoniae |
| 1908 | Streptococcus pyogenes [Group A Streptococcus] |
| 8888 | Other (DESCRIBE) |
| 9999 | Unknown |

## Late Infections (after DOL 3)

Each of the late infection items is based on whether the infant had the infection after Day 3 of life. In determining the date of Day 3, the date of birth counts as Day 1 regardless of the time of birth. For an infant born at 11:59 PM on September 1, Day 3 will be September 3.

The on-line form figures out whether the late infection items apply and provides information on the Date of Day 3 depending upon information entered for infant birth date, initial disposition, post-transport disposition, initial length of stay and total length of stay.

## Item 41a. Late Sepsis and/or Meningitis after Day 3 [LBPATH]

Select **Yes, Here** if a bacterial pathogen from the list of Bacterial Pathogens was recovered from a blood and/or cerebrospinal fluid culture after Day 3 of life

- at YOUR hospital prior to initial disposition, and/or
- at YOUR hospital four (4) or more hours following readmission after initial transport

Select **Yes, Elsewhere** if a bacterial pathogen from the list of Bacterial Pathogens was recovered from a blood and/or cerebrospinal fluid culture obtained after Day 3 of life either at a prior stay at another hospital or within four (4) hours of admission to your hospital and the infant was:

- at another hospital before being admitted to your hospital, and/or

- initially transported and then readmitted to your hospital after initial transport.

Select **Yes, Here and Elsewhere** if a bacterial pathogen from the list of Bacterial Pathogens was recovered from a blood and/or cerebrospinal fluid culture obtained after Day 3 of life BOTH at your hospital AND another hospital prior to initial disposition or following readmission after initial transport.

Select **No** if a bacterial pathogen from the list of Bacterial Pathogens was not recovered from a blood and/or cerebrospinal fluid culture, or if no blood or cerebrospinal fluid cultures were obtained after Day 3 of life.

Select **Not Applicable** if any of the following applies:

- The infant is discharged home or dies on or before Day 3 of life; OR
- The infant is transported from your center to another hospital on or before day 3 and either is not readmitted to your center before discharge home, death or first birthday or, is transported a second time on or before the Day 3 of life.

Select **Unknown** if this information cannot be obtained.

Note:

a. If a bacterial pathogen and coagulase negative staph are recovered during the same sepsis workup performed after Day 3, check only Bacterial Pathogen for that episode. If a bacterial pathogen is recovered during one episode of sepsis after Day 3, and coagulase negative staphylococcus is recovered during another episode of sepsis after Day 3 (associated with the three clinical criteria listed below) check both "Bacterial Pathogen" and "Coagulase Negative Staph."

b. If the infant has multiple infections during an episode of care, only record the first bacterial pathogen recovered from a blood and/or cerebrospinal fluid culture obtained after Day 3 of life from your hospital.

c. If an infant is transported to your hospital with a bacterial pathogen from another hospital, and then develops an infection from a different bacterial pathogen from your hospital, only record the pathogen acquired from your hospital. For example, an infant is transported to your hospital with GBS infection detected at another hospital AND E.coli from your hospital, only record E.coli Here.

## Pathogen Codes for Late Bacterial Sepsis and/or Meningitis (after day 3) [LBPATHCD1-LBPATHCD3], [LBPATHDESC]

If one or more bacterial pathogens were recovered either at your hospital or another hospital or both, select up to three pathogens that were recovered from the **Bacterial Infection Pathogens List**. If the pathogen recovered is not on the list, select the option **Other** and use the description box to describe the pathogen.

To ensure that this item reflects true late onset sepsis cases, please have an infection specialist at your NICU review each case especially regarding the use of the "Other" category. Use of the "Other" late infection category should account for roughly 1% of late infections coded.

**Bacterial Infection Pathogens List**

| Code | Description |
|---|---|
| 101 | Achromobacter species |
| 102 | Acinetobacter species including multidrug-resistant Acinetobacter |
| 103 | Aeromonas species |
| 104 | Alcaligenes species [A. xylosoxidans and others] |
| 201 | Bacteroides species |
| 202 | Burkholderia species [B. capecia and others] |
| 301 | Campylobacter species [C. fetus, C. jejuni and others] including drugresistant Campylobacter |
| 302 | Chryseobacterium species |
| 303 | Citrobacter species [C. diversus, C. freundii, C. koseri and others] |
| 304 | Clostridium species |
| 501 | Enterobacter species [E. aerogenes, E. cloacae, and others] including Carbapenem-resistant Enterobacter |
| 502 | Enterococcus species [E. faecalis (also known as Streptococcus faecalis), E. faecium, and others] including Vancomycin-resistant Enterococcus |
| 503 | Escherichia coli including Carbapenem-resistant Escherichia coli |
| 601 | Flavobacterium species |
| 801 | Haemophilus species [H. influenzae and others] |

| Code | Description |
|---|---|
| 1101 | Klebsiella species [K. oxytoca, K. pneumoniae and others] including Carbapenem-resistant Klebsiella and Cephalosporin-resistant Klebsiella |
| 1201 | Listeria monocytogenes |
| 1301 | Moraxella species [M. catarrhalis (also known as Branhamella catarrhalis) and others] |
| 1302 | Morganella morganii |
| 1401 | Neisseria species [N. meningitidis, N. gonorrhoeae and others] including drug- resistant N. gonorrhoeae |
| 1601 | Pantoea |
| 1602 | Pasteurella species |
| 1603 | Prevotella species |
| 1604 | Proteus species [P. mirabilis, P. vulgaris and others] |
| 1605 | Providencia species [P. rettgeri and others] |
| 1606 | Pseudomonas species [P. aeruginosa and others] including multidrugresistant Pseudomonas aeruginosa |
| 1801 | Ralstonia species |
| 1901 | Salmonella species including drug-resistant Salmonella serotype Typhi |
| 1902 | Serratia species [S. liquefaciens, S. marcescens and others] |
| 1903 | Staphylococcus coagulase positive [aureus] including Methicillinresistant Staphylococcus aureus and Vancomycin-resistant Staphylococcus aureus |
| 1904 | Stenotrophomonas maltophilia |

| Code | Description |
|---|---|
| 1905 | Group B Streptococcus or GBS [also known as Streptococcus agalactiae] |
| 1906 | Streptococcus anginosus [formerly Streptococcus milleri] |
| 1907 | Streptococcus pneumoniae |
| 1908 | Streptococcus pyogenes [Group A Streptococcus] |
| 8888 | Other (DESCRIBE) |
| 9999 | Unknown |

## Item 41b. Late (after day 3) Sepsis - Coag Neg Staph [CNEGSTAPH]

For verifying the presence of a Coagulase Negative Staph infection, the infant should meet all 3 of the following conditions after Day 3 of life:

1. Coagulase Negative Staphylococcus is recovered from a blood culture obtained from either a central line, or peripheral blood sample, and/or is recovered from cerebrospinal fluid obtained by lumbar puncture, ventricular tap or ventricular drain; AND
2. Signs of generalized infection (such as apnea, temperature instability, feeding intolerance, worsening respiratory distress or hemodynamic instability); AND
3. Treatment with 5 or more days of intravenous antibiotics after the above cultures were obtained.

Select **Yes, Here** if Coagulase Negative Staph occurred:

- at your hospital prior to initial disposition, and/or
- at your hospital four (4) or more hours following readmission after initial transport

Select **Yes, Elsewhere** if Coagulase Negative Staphylococcal Infection after Day 3 of life was diagnosed at a prior stay at another hospital or within four (4) hours of admission to your hospital and the infant was:

- at another hospital before being admitted to your hospital, and/or
- initially transported and then readmitted to your hospital after initial transport.

Select **Yes, Here and Elsewhere** if Coagulase Negative Staph occurred BOTH at your hospital AND another hospital.

Select **No** if the criteria for Coagulase Negative Staph are not met and the item applies.

Select **Not Applicable** if any of the following applies:

- The infant is discharged home or dies on or before Day 3 of life; OR
- The infant is transported from your center to another hospital on or before Day 3 of life and either is not readmitted to your center before discharge home, death or first birthday or, is transported a second time on or before the Day 3 of life.

Select **Unknown** if this information cannot be obtained.

Note:

a. If the infant died, was discharged, or transported prior to the completion of 5 days of intravenous antibiotics, this condition would still be met if the intention were to treat for 5 or more days.

b. When infants transport to your hospital or are readmitted to your hospital after initial transport, Coagulase Negative Staph will be considered to have occurred at another hospital in the following situations: 1. Coagulase negative staph was diagnosed at the other hospital prior to admission to your hospital or prior to readmission following initial transport. 2. Coagulase negative staph was diagnosed within 4 hours of admission to your hospital.

c. Recurrence or recrudescence of a coagulase negative staph infection that had previously occurred at another hospital will not be considered to be a coagulase negative staph infection that occurred at your hospital unless the original case of coagulase negative staph infection had resolved and the infant had been off of antibiotics for 1 week or more.

## Item 41c. Late (after day 3) Sepsis - Fungal [FUNGAL]

Select **Yes, Here** a fungus was recovered from a blood culture obtained from either a central line or peripheral blood sample and/or was recovered from cerebrospinal fluid obtained by lumbar puncture, ventricular tap or ventricular drain after Day 3 of life

- at your hospital prior to initial disposition, and/or
- at your hospital four (4) or more hours following readmission after initial transport

Select **Yes, Elsewhere** a fungus was recovered from a blood culture obtained from either a central line or peripheral blood sample and/or was recovered from cerebrospinal fluid obtained by lumbar puncture, ventricular tap or ventricular drain after Day 3 of life at a prior stay at another hospital or within four (4) hours of admission to your hospital and the infant was:

- at another hospital before being admitted to your hospital, and/or
- initially transported and then readmitted to your hospital after initial transport

Select **Yes, Here and Elsewhere** if a fungus was recovered from a blood culture obtained from either a central line or peripheral blood sample and/or is recovered from cerebrospinal fluid obtained by lumbar puncture, ventricular tap or ventricular drain after Day 3 of life BOTH at your hospital AND another hospital.

Select **No** if a fungus was not recovered from a blood culture obtained from either a central line or peripheral blood sample or if no blood cultures were obtained after Day 3. Also check No if a fungus was not recovered from cerebrospinal fluid obtained by lumbar puncture, ventricular tap or ventricular drain after Day 3 of life.

Select **Not Applicable** if any of the following applies:

- The infant is discharged home or dies on or before Day 3 of life; OR
- The infant is transported from your center to another hospital on or before day 3 and either is not readmitted to your center before discharge home, death or first birthday, or is transported a second time on or before the Day 3 of life.

Select **Unknown** if this information cannot be obtained.

Note:

a. Each of the late infection items is based on whether the infant had the infection after Day 3 of life. In determining the date of Day 3, the date of birth counts as Day 1 regardless of the time of birth. For an infant born at 11:59 PM on September 1, Day 3 will be September 3.

b. The on-line form figures out whether the late infection items apply and provides information on the Date of Day 3 depending upon information entered for infant birth date, initial disposition, post-transport disposition, initial length of stay and total length of stay.

## Item 42. Congenital Infections

Starting from 2018, the items in this group are applicable to all infants including delivery room deaths.

## Congenital Infection [VIRAL]

Select **Yes** if the infant was diagnosed with a congenital infection on the Congenital Infection List acquired in utero or during birth.

Select **No** if the infant was not diagnosed with a congenital infection on the Congenital Infection list acquired in utero or during birth.

Select **Unknown** if this information cannot be obtained.

Note:

This item refers to vertically transmitted infections from mother to child in the perinatal period that persist after childbirth. It includes (but is not limited to) infections in the SToRCH complex comprising syphilis, toxoplasmosis, rubella, cytomegalovirus, and herpes simplex. Fetal infections can cause congenital malformations.

## Pathogen Codes for Congenital Infection [VIRALCD1-VIRALCD3], [VIRALDESC]

If a viral infection was present and the response for item 42 is **Yes**, specify up to 3 pathogens from the **Congenital Infections Pathogen List**. If "Other" is selected, enter a description in the space provided.

To ensure that the organism specified reflects a true congenital infection case, **please have an infection specialist at your NICU review each case**. Use of the **"Other"** congenital infection category should account for roughly 1% of congenital infections coded.

**Congenital Infections Pathogen List:**

| Code | Description |
|---|---|
| 101 | Toxoplasmosis (Toxoplasma gondii) |
| 102 | Rubella virus |
| 103 | Syphilis (Treponema pallidum) |
| 104 | Cytomegalovirus |
| 105 | Herpes simplex |
| 106 | Parvovirus B19 |
| 107 | Zika virus |
| 108 | Varicella zoster virus |
| 8888 | Other (DESCRIBE) |

## Other Diagnoses and Procedures

### Patent Ductus Arteriosus (PDA)

### Item 43a. Patent Ductus Arteriosus [PDA]

Select **Check PDA meeting revised 2011 VON definition** if at least **one** of the following findings is present:

- Left to right or bidirectional ductal shunt on Doppler echo;
- Systolic or continuous murmur

*and* at least **two** of the following findings are present:

- Hyperdynamic precordium
- Bounding pulses
- Wide pulse pressure
- Pulmonary vascular congestion, cardiomegaly, or both

Select **PDA diagnosis based on echo and/or clinical evidence or was treated for PDA, but not meeting all 2011 VON criteria** if the infant does not meet the 2011 VON criteria listed in the previous section, but was treated with indomethacin for PDA or was treated with ibuprofen for PDA or underwent a PDA ligation or had a PDA ascertained via an echocardiographic or clinical diagnosis.

Select **No** if the infant does not satisfy the above conditions.

Select **Unknown** if this information cannot be obtained.

## Item 43b. Indomethacin [INDOMETH]

Select **Yes** if indomethacin was administered after birth for any reason. The answer to this question may be Yes even if the infant did not meet the definition of PDA given in Item 43a.

Select **No** if indomethacin was not administered.

Select **Unknown** if this information cannot be obtained.

Note:

Ibuprofen should not be counted as Indomethacin.

## Item 43c. Ibuprofen for the Prevention or Treatment of PDA [IBUPROFEN]

Select **Yes** if ibuprofen was administered at any time after birth for the prevention or treatment of PDA.

Select **No** if ibuprofen was not administered for the prevention or treatment of PDA.

Select **Unknown** if this information cannot be obtained.

Note:

a. Ibuprofen used for reasons other than the prevention or treatment of PDA should NOT be coded as Yes for this item.

## Item 43d. Acetaminophen for the Prevention or Treatment of PDA [ACETAMIN]

Select **Yes** if acetaminophen (paracetamol) was administered at any time after birth for the prevention or treatment of PDA.

Select **No** if acetaminophen (paracetamol) was not administered for the prevention or treatment of PDA.

Select **Unknown** if this information cannot be obtained.

Note:

a. Aceteminophen used for reasons other than the prevention or treatment of PDA should NOT be coded as Yes for this item.

## Item 43e. PDA Ligation or PDA Closure by Catherization [SRGPDA]

Select **Yes, here** if closure of the ductus arteriosus by ligation or catheterization was attempted either in the operating room or NICU at YOUR hospital prior to initial disposition or following readmission after initial transport.

Select **Yes, elsewhere** if closure of the ductus arteriosus by ligation or catheterization was attempted either in the operating room or NICU at ANOTHER hospital.

Select **Yes, here and elsewhere** if closure of the ductus arteriosus by ligation or catheterization was attempted either in the operating room or NICU BOTH at your hospital and another hospital.

Select **No** if closure of the ductus arteriosus by ligation or catheterization was not attempted.

Select **Unknown** if this information cannot be obtained.

Note:

a. Closure of the ductus arteriosus by ligation or catheterization is considered to be done at another hospital in the following situations:

    1. Closure of the ductus arteriosus by ligation or catheterization done before admission to your hospital.

    2. Closure of the ductus arteriosus by ligation or catheterization done prior to readmission to your hospital after initial transport.

b. If a closure of the ductus arteriosus by ligation or catheterization was performed, code at least one of the following three surgery codes should be present:

    - S515 Open thoracotomy / sternotomy for patent ductus arteriosus closure

    - S516 Thoracoscopic surgery for patent ductus arteriosus closure

    - S605 Interventional catheterization for patent ductus arteriosus closure

c. If an infant had a PDA repair as part of other heart surgery, PDA surgery should be coded as Yes, and a specific surgical code for PDA Surgery (S515, S516, S605) **as well as** any codes

related to the other heart surgery should be entered. For example, if the PDA is ligated as a component of the repair or palliation of congenital heart disease, use a specific surgical code for PDA surgery (S515, S516, S605) and code S504.

d. This item is Not Applicable if the infant was not diagnosed with PDA.

## Necrotizing Enterocolitis (NEC)

### Item 44a. Probiotics [PROBIOTICS]

Select **Yes** if the infant received any probiotics.

Select **No** if the infant did not receive any probiotics.

Select **Unknown** if this information cannot be obtained.

Note:

a. Probiotics must contain live microorganisms administered enterally with feedings or as feeding supplements.

b. Probiotics are to be distinguished from prebiotics, which are nondigestible carbohydrates meant to encourage proliferation of desirable gut flora.

c. Yogurt should not be considered a probiotic for this question.

d. VON will not be providing a list of accepted probiotics because the range of options is growing so quickly, but only pharmaceutical preparations should be included for the purposes of this data item.

### Item 44b. Necrotizing Enterocolitis [NEC]

Determine whether an infant has (a) Necrotizing Enterocolitis (NEC) diagnosed at surgery, or (b) NEC diagnosed at postmortem examination, or (c) NEC diagnosed clinically and radiographically using the following criteria:

1. One or more of the following clinical signs present:
    - Bilious gastric aspirate or emesis;
    - Abdominal distension;
    - Occult or gross blood in stool with no apparent rectal fissure.

    AND

2. One or more of the following radiographic findings present:
    - Pneumatosis intestinalis;
    - Hepato-biliary gas;
    - Pneumoperitoneum.

Select **Yes, Here** if NEC was diagnosed:

- at your hospital prior to initial disposition, and/or
- at your hospital four (4) or more hours following readmission after initial transport.

Select **Yes, Elsewhere** if NEC was diagnosed at a prior stay at another hospital or within 4 hours of admission to your hospital and the infant was:

- at another hospital before being admitted to your hospital, and/or
- initially transported and then readmitted to your hospital after initial transport

Select **Yes, Here and Elsewhere** if NEC was diagnosed BOTH at your hospital AND at another hospital as defined above. Only select "Yes Here and Elsewhere" if NEC happened elsewhere prior to your hospital and then at your hospital, after a week of full feedings, NEC happened again.

Select **No** if the infant did not satisfy the above definition of NEC.

Select **Unknown** if this information cannot be obtained.

Note:

a. Infants who satisfy the definition of Necrotizing Enterocolitis below but are found at surgery or post-mortem examination for that episode to have a "Focal Gastrointestinal Perforation" should be coded as having "focal gastrointestinal perforation," not as having NEC. There may also be infants who have an isolated perforation unassociated with clinical NEC; these cases should not be classified as having NEC.

b. When infants transport to your hospital or are readmitted to your hospital after initial transport, NEC will be considered to have occurred at another hospital in the following situations: 1. NEC was diagnosed at the other hospital prior to admission to your hospital or prior to readmission following initial transport. 2. NEC was diagnosed within 4 hours of admission to your hospital.

c. Recurrence or recrudescence of NEC that had previously occurred at another hospital will not be considered to be NEC that occurred at your hospital unless the original case of NEC had resolved and the infant had been on full feedings for 1 week or more.

## Item 44c. NEC Surgery [SRGNEC]

An infant had NEC surgery if it had NEC and underwent one or more of the following procedures:

- laparotomy,
- laparoscopy,
- bowel resection, or
- intraperitoneal drain placement

Select **Yes, Here** if one of the above procedures was performed at YOUR hospital prior to initial disposition or following readmission after initial transport.

Select **Yes, Elsewhere** if one of the above procedures was performed at ANOTHER hospital.

Select **Yes, Here and Elsewhere** if one of the above procedures was performed at BOTH your hospital and another hospital.

Select **No** if none of the following procedures - laparotomy, laparoscopy, bowel resection or intraperitoneal drain placement - were performed.

Select **Unknown** if this information cannot be obtained.

Note:

a. If NEC Surgery is answered "Yes", at least one of the following surgery codes must be entered in Item 47: S302 Laparoscopy S303 Laparotomy S307 Jejunostomy, ileostomy, colonoscopy for intestinal diversion S308 Small bowel resection S309 Large bowel resection S333 Primary peritoneal drainage for NEC, suspected NEC or intestinal perforation.

b. If the surgery code S307 is recorded and the infant has a bowel resection, codes S308 and/or S309 should also be recorded.

c. This item is Not Applicable and grayed out if the infant was not diagnosed with NEC.

## Item 45. Focal Intestinal Perforation [GIPERF]

The diagnosis for Focal Gastrointestinal Perforation is separate from Necrotizing Enterocolitis. This diagnosis will be based on visual inspection of the bowel at the time of surgery or post-mortem examination that demonstrates a single focal perforation with the remainder of the bowel appearing normal.

Select **Yes, Here** if Focal Gastrointestinal Perforation (as defined above) was diagnosed

- at your hospital prior to initial disposition, and/or
- at your hospital four (4) or more hours following readmission after initial transport

Select **Yes, Elsewhere** if Focal Gastrointestinal Perforation (as defined above) was diagnosed during a prior stay at another hospital or within four (4) hours of admission to your hospital and the infant was:

- at another hospital before being admitted to your hospital, and/or
- initially transported and then readmitted to your hospital after initial transport

Select **Yes, Here and Elsewhere** if Focal Gastrointestinal Perforation (as defined above) was diagnosed BOTH at your hospital AND another hospital.

Select **No** if the infant did not have a Focal Gastrointestinal Perforation as defined above.

Select **Unknown** if this information cannot be obtained.

## Retinopathy of Prematurity (ROP)

***For NICUs that do not participate in the expanded VON DB, the ROP section is only required for infants with birth weights 401 to 1,500 grams or 22 to 31 completed weeks gestation.***

## Item 46a. Retinal Exam Performed [EYEX]

Select **Yes** if an indirect ophthalmologic examination for retinopathy of prematurity (ROP) was performed at any time.

Select **No** if an indirect ophthalmologic examination for ROP was not performed.

Select **Unknown** if this information cannot be obtained.

## Item 46b. If Retinal Exam Performed, Worst Stage of ROP [ISTAGE]

If a retinal examination was performed, enter the worst stage of ROP documented on any exam in the eye with the most advanced stage (from an International Committee for the Classification of ROP: The International Classification of ROP revisited. Arch Ophthalmol 2005;123:991-999).

This item is **Not Applicable** if a retinal exam was not performed, and the answer to "Was a Retinal Examination Performed" is No.

- Stage 0: No evidence of ROP
- Stage 1: Presence of demarcation line (+/- abnormal vascularization)
- Stage 2: Presence of intraretinal ridge
- Stage 3: Presence of a ridge with extraretinal fibrovascular proliferation
- Stage 4: Partial retinal detachment
- Stage 5: Retinal detachment

Note:

This item is not applicable if the infant did not have an eye exam or if the infant does not meet small baby criteria (401 to 1,500 grams birth weight or 22 to 31 completed weeks of gestation at birth) and your center does not participate in the expanded VON data collection.

## Item 46c. Treatment with Anti-VEGF Drug [VEGF]

Per VON, this item is applicable to all small babies irrespective of whether they received an eye exam or an ROP diagnosis.

Select **Yes** if the infant received bevacizumab (Avastin) or other anti-vascular endothelial growth factor (VEGF) drug in one or both eyes for the treatment of retinopathy of prematurity (ROP).

Select **No** if the infant did not receive bevacizumab (Avastin) or other anti- VEGF in one or both eyes for the treatment of retinopathy of prematurity (ROP).

Select **Unknown** if this information cannot be obtained.

### Item 46d. ROP Surgery [SRGROP]

Select **Yes, Here** if retinal cryosurgery and/or laser surgery was performed for ROP at YOUR hospital prior to initial disposition or following readmission after initial transport.

Select **Yes, Elsewhere** if retinal cryosurgery and/or laser surgery was performed for ROP at ANOTHER hospital.

Select **Yes, Here and Elsewhere** if retinal cryosurgery and/or laser surgery was performed for ROP BOTH at your hospital and another hospital.

Select **No** if retinal cryosurgery and/or laser surgery was not performed for ROP.

Select **Unknown** if this information cannot be obtained.

Note:

This item is not applicable if the infant did not have an eye exam or if the infant did not have evidence of ROP or if the infant does not meet small baby criteria (401 to 1,500 grams birth weight or 22 to 31 completed weeks of gestation at birth) and your center does not participate in the expanded VON data collection.

## Other Major Surgery

### Item 47a. Other Surgery [SRGOTH]

Select **Yes** if a surgical procedure from the **Major Surgical Procedure List** was performed for the infant.

Select **No** if a surgical procedure meeting NICU Data criteria was not performed for the infant.

Select **Unknown** if this information cannot be obtained.

Note:

a. If Surgery for NEC is answered Yes, at least one of the NEC surgery codes must be entered, therefore this item must be answered Yes.

b. If Surgery or Interventional Catheterization for Closure of PDA is answered Yes, at least one of the PDA surgery codes must be entered, therefore this item must be answered Yes

c. If the infant only had ROP Surgery, the answer to this item is No.

d. The following procedures are not considered major surgical procedures: circumcision, central lines, broviac catheters, percutaneous venous catheters, central venous catheters, PICC lines, umbilical artery lines, umbilical venous lines, any other intravascular catheter, ECMO, ECMO cannulation, ECMO decannulation, peritoneal dialysis, placement or removal of peritoneal dialysis catheters, chest tube placement. is not considered surgery. If

the infant underwent these procedures and no other qualifying surgeries, this item must be answered No.

### Code for Other Surgery 1-10 [SRGCD1-SRGCD10], [SRGSSI1-SRGSSI10], [SRGOTHDESC]

If a surgical procedure was performed for the infant, select from the list of procedures considered Other Surgery for the purpose of the NICU Database:

| Code | Description |
|---|---|
| | **Head and Neck** |
| S101 | Tracheostomy |
| S102 | Cricoid split |
| S103 | Ophthalmologic surgery OTHER than laser or cryosurgery for ROP (Note: Record ROP surgery in the Ophthalmic Diagnoses and Procedures section. Do not record ROP surgery as "Other Surgery".) |
| S104 | Cleft lip or palate repair |
| S105 | Branchial cleft sinus excision |
| S106 | Thyroglossal duct excision |
| S107 | Palliative or definitive repair of choanal atresia |
| S108 | Mandibular (jaw) distraction |
| S109 | Craniotomy |
| S100 | Other head and neck surgery requiring general or spinal Anesthesia (DESCRIBE) |
| | **Thorax** |
| S201 | Tracheal Resection |

| Code | Description |
|---|---|
| S202 | Aortopexy |
| S203 | Tracheoesophageal atresia and/or fistula repair |
| S204 | Thoracoscopy (with or without pleuridesis/pleurectomy) |
| S205 | Thoracotomy (with or without pleural or lung biopsy) |
| S206 | Pneumonectomy, lobectomy, or partial lobectomy |
| S207 | Resection of pulmonary sequestration (intrathoracic or extrathoracic) |
| S208 | Resection of mediastinal mass |
| S209 | Resection of chest wall |
| S210 | Bronchoscopy (with or without biopsy) |
| S211 | Esophagoscopy (with or without biopsy) |
| S212 | Surgery for congenital Cystic Adenomatoid Malformation of the Lung |
| S213 | Lung Transplant |
| S214 | Sternal Closure |
| S200 | Other thoracic surgery requiring general or spinal anesthesia (DESCRIBE) |
| | **Abdomen** (Note: Record all applicable codes even if NEC surgery has already been checked "Yes" in the Gastrointestinal Diagnoses and Procedures section.) |
| S301 | Rectal biopsy with or without anoscopy |
| S302 | Laparoscopy (diagnostic, with/without biopsy) |

| Code | Description |
|---|---|
| S303 | Laparotomy (diagnostic or exploratory, with/without biopsy) |
| S304 | Fundoplication |
| S305 | Pyloromyotomy |
| S306 | Pyloroplasty |
| S307 | Jejunostomy, ileostomy, colostomy for intestinal diversion (with/without bowel resection) |
| S308 | Small bowel resection |
| S309 | Large bowel resection |
| S310 | Duodenal atresia/stenosis/web Repair |
| S311 | Jejunal, ileal, or colonic atresia repair (or repair of multiple intestinal atresias) |
| S312 | Excision of Meckel's diverticulum |
| S313 | Drainage of intra-abdominal abscess (not as primary treatment for NEC, see code S333) |
| S314 | Surgery for meconium ileus |
| S315 | Excision of omphalomesenteric duct or duct remnant |
| S316 | Gastroschisis repair (primary or staged) (rmv.2018, see codes S338 and S339) |
| S317 | Omphalocele repair (primary or staged) (rmv.2018, see codes S340 and S341) |
| S318 | Lysis of adhesions without other procedure |
| S319 | Repair of imperforate anus (with or without vaginal, urethral, or vesicle fistula) |
| S320 | Pull through for Hirschsprung's disease (any technique) |

| Code | Description |
|---|---|
| S321 | Pancreatectomy (partial, near total or total) |
| S322 | Partial/complete splenectomy or splenorraphy |
| S323 | Resection of retroperitoneal tumor |
| S324 | Resection of sacrococcygeal tumor |
| S325 | Repair of diaphragmatic hernia |
| S326 | Plication of the diaphragm |
| S327 | Gastrostomy/jeunostomy tube |
| S328 | Upper endoscopy (stomach or duodenum, with or without biopsy) |
| S329 | Colonoscopy/sigmoidoscopy (with or without biopsy) |
| S330 | Takedown of ostomy and/or reanastomosis of bowel (small or large) |
| S331 | Ladd's or other procedure for correction of malrotation |
| S332 | Appendectomy |
| S333 | Primary peritoneal drainage for NEC, suspected NEC, or intestinal perforation |
| S334 | Anoplasty |
| S335 | Kasai procedure |
| S336 | Liver biopsy done during laparotomy or laparoscopy (includes wedge or needle technique) |
| S337 | Umbilical Hernia Repair |

| Code | Description |
|---|---|
| S338 | Primary closure for gastroschisis (add.2018) |
| S339 | Staged closure for gastroschisis (add.2018) |
| S340 | Primary closure for omphalocele (add.2018) |
| S341 | Staged closure for omphalocele (add.2018) |
| S300 | Other abdominal surgery requiring general or spinal anesthesia (DESCRIBE) |
| | **Genitourinary** |
| S401 | Cystoscopy (diagnostic, with or without biopsy) |
| S402 | Adrenalectomy |
| S403 | Nephrectomy |
| S404 | Nephrostomy |
| S405 | Urteterostomy |
| S406 | Resection of urachal cyst |
| S407 | Cystostomy |
| S408 | Closure of bladder exstrophy |
| S409 | Resection of posterior urethral valves |
| S410 | Inguinal hernia repair |
| S411 | Orchidopexy |
| S412 | Orchiectomy |

| Code | Description |
|---|---|
| S413 | Drainage or removal of ovarian cyst |
| S414 | Oopherectomy (partial or complete) |
| S416 | Pyeloplasty |
| S417 | Renal transplant |
| S400 | Other genitourinary surgery requiring general or spinal anesthesia (DESCRIBE) |
| | **Open Heart or Vascular Procedures** (Note: PDA ligation is recorded in section Cardiac Diagnoses and Procedures. Do not record PDA Ligation as "Other Surgery" if it was already recorded in section Cardiac Diagnoses and Procedures.) |
| S501 | Vascular Ring division |
| S502 | Repair of coarctation of the aorta |
| S503 | Repair of major vascular injury |
| S504 | Repair or palliation of congenital heart disease |
| S505 | Heart transplant |
| S506 | Implanted Pacemaker (permanent - do not code temporary pacemakers) |
| S507 | Norwood procedure with Sano modification (add.2018) |
| S508 | Norwood procedure with aortopulmonary shunt (add.2018) |
| S509 | Hybrid surgery (ductal stenting and bilateral branch pulmonary artery banding) (add.2018) |
| S510 | Truncus arteriosus repair (add.2018) |

| Code | Description |
|---|---|
| S511 | Arterial switch (add.2018) |
| S512 | Repair of total anomalous pulmonary venous return (add.2018) |
| S513 | Aorta pulmonary shunt (add.2018) |
| S514 | Pulmonary artery banding (add.2018) |
| S515 | Open thoracotomy / sternotomy for patent ductus arteriosus closure (add.2018) |
| S516 | Thoracoscopic surgery for patent ductus arteriosus closure (add.2018) |
| S500 | Other open heart or vascular surgery requiring general or spinal anesthesia (DESCRIBE) |
| | **Diagnostic or interventional cardiac catheterization** |
| S601 | Diagnostic cardiac catheterization |
| S602 | Interventional catheterization with balloon septostomy |
| S603 | Interventional catheterization with aortic valvuloplasty |
| S604 | Interventional catheterization with pulmonary valvuloplasty |
| S605 | Interventional catheterization for patent ductus arteriosus closure (add.2018) |
| S600 | Other interventional catheterization requiring general or spinal anesthesia (DESCRIBE) |
| | **Skin and Soft Tissue** |
| S700 | Skin or soft tissue surgery requiring general or spinal anesthesia (DESCRIBE) |
| | **Musculoskeletal System** |
| S800 | Other musculoskeletal surgery requiring general or spinal anesthesia (DESCRIBE) |

| Code | Description |
|---|---|
| | **Central Nervous System** |
| S901 | Ventriculoperitoneal or other ventricular shunt |
| S902 | External ventricular drain |
| S903 | Ventricular drain with reservoir placement or removal |
| S904 | Meningocele or myelomeningocele repair |
| S905 | Encephalocele repair |
| S900 | Other central nervous system surgery requiring general or spinal anaesthesia (DESCRIBE) |
| | **Fetal Surgery** |
| S1101 | Separation of conjoined twins |
| S1000 | Fetal surgery |

You may enter up to ten Surgery Codes in the spaces provided. If the specific surgical procedure is not listed, and the procedure was performed under general or spinal anesthesia, use the code for other surgery in that category (for example, S100, S200, etc.) and provide a description in the text field.

If Surgery Code S100, S200, S300, S400, S500, S600, S700, S800, S900, S1000, and/or S1001 are entered, a description must be entered in the field provided. Please be specific and do not use general descriptions.

| | |
|---|---|
| S100 | Other head and neck surgery requiring general or spinal anesthesia |
| S200 | Other thoracic surgery requiring general or spinal anesthesia |
| S300 | Other abdominal surgery requiring general or spinal anesthesia |
| S400 | Other genito-urinary surgery requiring general or spinal anesthesia |

| | |
|---|---|
| S500 | Other open heart or vascular surgery requiring general or spinal anesthesia |
| S600 | Other interventional cardiac catheterization |
| S700 | Skin or soft tissue surgery requiring general or spinal anesthesia |
| S800 | Other musculoskeletal surgery requiring general or spinal anesthesia |
| S900 | Other central nervous system surgery requiring general or spinal anesthesia |
| S1000 | Fetal Surgery |

Record procedures for other cardiac catheterization (S600) whether or not the infant received general or spinal anesthesia.

Note:

a. If Surgery for NEC is answered Yes, at least one of the NEC surgery codes must be entered in this Data Item (S302, S303, S307, S308, S309, S333).

b. If Surgery for NEC and Other Surgery are both answered Yes, one or more surgery codes in the Surgery Codes List other than S333 must be entered in this Data Item.

c. If Surgery or Interventional Catheterization for Closure of PDA is answered Yes, at least one of the PDA surgery codes must be entered in this Data Item (S515, S516, S605).

d. If an infant had a PDA repair as part of other heart surgery, PDA surgery should be coded as Yes, and a specific surgical code for PDA Surgery (S515, S516, S605) **as well as** any codes related to the other heart surgery should be entered.

e. Codes for **other** procedures (i.e. S100, S200, S300, S400, S500, S700, S800, S900) should be used only to identify procedures for which there are no specific codes and that are performed under general or spinal anesthesia.

f. Do not use **other** codes to further describe surgical procedures that are on the list or to indicate why procedures are performed. For example, do not use S500 to add a description for the S504 procedure or to explain why heart surgery was performed. Cardiac surgery for the repair or palliation of congenital heart disease is coded as S504. Do not use code S500 to further describe the details of that surgery.

g. Central lines are not considered surgery. Please **do not record any of the following as surgery**: Broviac catheters, percutaneous venous catheters, central venous catheters, PICC lines, umbilical artery lines, umbilical venous lines, or any other intravascular catheter. We recognize that some of these lines may be placed while the infant is under anesthesia for other procedures. Do not code any lines as surgery even if they are placed under general or spinal anesthesia.

h. ECMO, ECMO cannulation, ECMO decannulation are not considered surgery. Please do not code ECMO, ECMO cannulation, or decannulation as surgery even if the procedures are performed under anesthesia.

i. Peritoneal dialysis and placement or removal of peritoneal dialysis catheters are not considered surgery.

j. Chest tube placement is not considered surgery.

**Location of Surgery**

For each surgical procedure performed, indicate where the procedure was done for each surgery code entered:

Select **Here** if the surgical procedure is performed:

- only at your hospital prior to Initial Disposition, and/or
- at your hospital following readmission after initial transfer without being discharged home.

Select **Elsewhere** if the surgical procedure is performed:

- at the "Transferred From" center (outborn) before being admitted to your hospital, or
- at the "Transferred To" center only if the infant is:
    - readmitted to your center, and
    - not discharged home before being readmitted to your center.

Select **Both** if the surgical procedure is performed both at "Your Hospital" and "Other Hospital" as defined above.

**Surgical Site Infection following Surgery at Your Hospital**

Check the SSI check box if - at any time prior to discharge - the infant had a surgical site infection resulting from this surgical procedure done at Your Hospital.

Note:

a. Surgical site infections include superficial, deep incisional, or organ space. Please refer to the Centers for Disease Control website for descriptions of these infections: http://www.cdc.gov/nhsn/acute-carehospital/ssi/.

b. If the infant had multiple surgical procedures at the same episode of surgery, code only one surgical code that resulted in the surgical site infection.

## Neurological

### Peri-Intraventricular Hemorrhage

### Item 48a. Cranial Image Done on or before DOL28 [IMAGE28]

Select **Yes** if neural imaging (cranial ultrasound, CT scan, MRI scan, etc.) was performed at least once on or before day 28.

Select **No** if neural imaging was not performed on or before day 28.

Select **Unknown** if this information cannot be obtained.

Note:

The date of Day 28 is determined by using the calendar date of birth as day 1 regardless of the time of birth. Thus for an infant born at 11:59 PM on September 1, Day 28 occurs on September 28. The date of Day 28 is calculated as Date of Birth plus 27 days. The on-line form determines the date of Day 28 based on infant birth date.

## Item 48b. Grade of Peri-IVH [IGRADE]

If neural imaging was performed on or before day 28, enter the grade of hemorrhage based on the criteria below.

This item is **not applicable** if neural imaging was NOT performed on or before Day 28.

Grade 0: No subependymal or intraventricular hemorrhage

Grade 1: Subependymal germinal matrix hemorrhage only

Grade 2: Intraventricular blood, no ventricular dilation

Grade 3: Intraventricular blood, ventricular dilation

Grade 4: Intraparenchymal hemorrhage

Note:

This item is not applicable if no ultrasound, CT, or MRI was done on or before Day 28.

## Item 48c. Where did Peri-IVH first occur? [PIHHEMLOC]

Note that this item does not ask where the worst grade occurred but rather where any PIH (grades 1 to 4) first occurred.

Select **First Here** if Peri-IVH (grades 1 to 4 as defined above) was first diagnosed:

- at your hospital prior to initial disposition, or
- at your hospital four (4) or more hours following readmission after initial transport

Select **First Elsewhere** if Peri-IVH (grades 1 to 4 as defined above) was first diagnosed during a prior stay at another hospital or within four (4) hours of admission to your hospital and the infant was:

- at another hospital before being admitted to your hospital, or
- initially transported and then readmitted to your hospital after initial transport

Select **Unknown** if this information cannot be obtained.

Note:

This item is not applicable if no Peri-IVH occurred or if no ultrasound, CT, or MRI was done on or before Day 28.

### Item 48d. Shunt placed for bleed [SHUNT]

Select **Yes** if a shunt was placed for an acquired post-hemorrhagic hydrocephalus.

Select **No** if no shunt was placed, there was no hemorrhage present, or neural imaging was not performed.

Select **Unknown** if this information cannot be obtained.

Note:

A shunt placed for congenital hydrocephalus, not due to cranial hemorrhage, should be coded No.

This item is not applicable if no Peri-IVH occurred or if no ultrasound, CT, or MRI was done on or before Day 28.

### Item 48e. Other Intracranial hemorrhage (on or before Day 28) [OTHHEM], [OTHHEMDESC]

Select **Yes** if neural imaging (either ultrasound, CT scan, MRI scan, etc.) showed evidence of intracranial hemorrhage other than Peri-IVH grades 1 to 4. Includes subdural, epidural, subarachnoid bleeds and parenchymal hemorrhage not related to P/IVH. Do not include extracranial bleeds such as subgaleal hemorrhages or cephalhematomas. Specify the type of intracranial hemorrhage in the space provided.

Select **No** if no other evidence of hemorrhage was found.

Select **Unknown** if this information cannot be obtained.

Note:

This item is not applicable if no ultrasound, CT, or MRI was done on or before Day 28.

## Cystic Periventricular Leukomalacia (CPVL)

### Item 49a. Cystic Periventricular Leukomalacia (CPVL) [PVLIMAG]

Select **Yes** neural imaging (either ultrasound, CT scan, MRI scan) was performed at any time. This includes imaging performed after Day 28.

Select **No** if no neural imaging (either ultrasound, CT scan, MRI scan) was performed at any time.

Select **Unknown** if this information cannot be obtained."If neural image was performed, was there evidence of Cystic PVL?Select **Yes** if the infant has evidence of cystic periventricular leukomalacia (CPL) on a Cranial Ultrasound , CT, or MRI scan obtained at any time.

## Item 49b. If neural image was performed, was there evidence of Cystic PVL? [PVL]

Select **Yes** if the infant has evidence of cystic periventricular leukomalacia (CPL) on a Cranial Ultrasound , CT, or MRI scan obtained at any time.

Select **No** if there was no evidence of cystic PVL on any Cranial Ultrasound, CT, or MRI and at least one cranial imaging study (ultrasound,CT, or MRI) was done.

Select **Unknown** if this information cannot be obtained.

Note:

To be considered cystic periventricular leukomalacia there must be multiple small periventricular cysts identified. Periventricular echogenicity without cysts should not be coded as cystic periventricular leukomalacia. A porencephalic cyst in the area of previously identified intraparenchymal hemorrhage should not be coded as cystic periventricular leukomalacia. Periventricular abnormalities on CT or MRI should not be coded as cystic periventricular leukomalacia unless multiple small periventricular cysts are identified.

This item is **Not Applicable** if no cranial imaging study (Ultrasound, CT, or MRI) was ever done.

## Item 50. Seizures [SEIZURE]

Select **Yes** if there is compelling clinical evidence of seizures, or of focal or multifocal clonic or tonic seizures. Also select Yes if there is EEG evidence of seizures regardless of clinical status.

Select **No** if there is no evidence of seizures.

Select **Unknown** if this information cannot be obtained.

## Item 51. Hypoxic Ischemic Encephalopathy [HIE]

Select **Severe** if the infant was diagnosed with Hypoxic-Ischemic Encephalopathy (HIE) as defined below, and the worst stage observed during the 168 hours (7 days) following birth is that the infant is in deep stupor or coma. Infants in this category are not arousable in response to arousal maneuvers.

Select **Moderate** if the infant was diagnosed with Hypoxic-Ischemic Encephalopathy (HIE) as defined below, and the worst stage observed during the 168 hours (7 days) following birth is that the infant is lethargic or in mild stupor. Infants in this category are arousable but have a diminished response to arousal maneuvers.

Select **Mild** if the infant was diagnosed with Hypoxic-Ischemic Encephalopathy (HIE) as defined below, and the worst stage observed during the 168 hours (7 days) following birth is that the infant is alert or hyperalert, with either a normal or exaggerated response to arousal.

Select **None** if the infant was not diagnosed with Hypoxic- Ischemic Encephalopathy.

Select **Not Applicable** if the infant has a gestational age at birth of less than 36 weeks and your center does not participate in the VON expanded data collection. If your center participates in the VON expanded data collection, this item applies to all NICU admissions starting from 2017.

Select **Unknown** if this information cannot be obtained.

**HIE Diagnosis**

The diagnosis of Hypoxic-Ischemic Encephalopathy requires the presence of all three of the following criteria:

1. The presence of a clinically recognized encephalopathy within 72 hours of birth. Encephalopathy is defined as the presence of 3 or more of the following findings within the first 72 hours after birth.
    - abnormal level of consciousness: hyperalertness, lethargy, stupor or coma;
    - abnormal muscle tone: hypertonia, hypotonia or flaccidity;
    - abnormal deep tendon reflexes: increased, depressed or absent;
    - seizures: subtle, multifocal or focal clonic;
    - abnormal Moro reflex: exaggerated, incomplete or absent;
    - abnormal suck: weak or absent;
    - abnormal respiratory pattern: periodic, ataxic or apneic;
    - oculomotor or pupillary abnormalities: skew deviation, absent or reduced Doll's eyes or fixed unreactive pupils

    AND

2. Three or more supporting findings from the following list:
    - arterial cord pH < 7.00;
    - APGAR score at 5 minutes of ≤5;
    - evidence of multiorgan system dysfunction (see below);
    - evidence of fetal distress on antepartum monitoring: persistent late decelerations, reversal of end- diastolic flow on Doppler flow studies of the umbilical artery or a biophysical profile of 2 or less;
    - evidence on CT, MRI, technetium or ultrasound brain scan performed within 7 days of birth of diffuse or multifocal ischemia or of cerebral edema;
    - abnormal EEG: low amplitude and frequency, periodic, paroxysmal or isoelectric;

    AND

3. The absence of an infectious cause, a congenital malformation of the brain or an inborn error of metabolism which could explain the encephalopathy. Multiorgan system dysfunction requires evidence of dysfunction of one or more of the following systems within 72 hours of birth:
    - Renal: oliguria or acute renal failure;
    - GI: necrotizing enterocolitis, hepatic dysfunction;
    - Hematologic: Thrombocytopenia, disseminated intravascular coagulopathy;
    - Endocrine: hypoglycemia, hyperglycemia, hypercalcemia, syndrome of inappropriate ADH secretion (SIADH);
    - Pulmonary: persistent pulmonary hypertension;
    - Cardiac: myocardial dysfunction, tricuspid insufficiency.

## Congenital Anomalies & Hyperbilirubinemia

### Congenital Anomalies

### Item 52a. Congenital Anomalies [CMAL]

Select **Yes** if the infant had one or more of the congenital anomalies listed. Use the list of codes to check off the congenital anomalies present among those listed. You may check up to 5 defects.

Select **Yes** if the infant had congenital anomalies that are not explicitly listed on the form, which were lethal, or life threatening. In this case, use the defect code of "100" (in addition to any other applicable code) and describe the defects in detail in the space provided for description. To be considered as lethal or life threatening a congenital anomaly must either: 1) be the primary cause of death, or 2) be treated prior to discharge with specific surgical or medical therapy to correct a major anatomic defect or a life threatening physiologic dysfunction.

Select **No** if an infant was not diagnosed as having one or more of the congenital anomalies listed on the form and did not have an unlisted congenital anomaly, which was lethal or life threatening.

Select **Unknown** if this information cannot be obtained.

### Congenital Anomaly Codes [BDCD1-BDCD5]

If a congenital anomaly was diagnosed, specify up to 5 birth defects from the **Congenital Anomaly list**:

| Code | Description |
|---|---|
| 100 | Lethal or Life-Threatening Congenital Anomaly Not Listed Below (DESCRIBE) |

| Code | Description |
|---|---|
| | **Central Nervous System Anomalies** |
| 101 | Anencephaly |
| 102 | Meningomyelocele |
| 103 | Hydranencephaly |
| 104 | Congenital Hydrocephalus |
| 105 | Holoprosencephaly |
| 106 | Microcephaly |
| 107 | Hypopituitary |
| 108 | Septic Optic Dysplasia |
| 109 | Encephalocele |
| 150 | Other CNS Defect (DESCRIBE) |
| | **Congenital Heart Anomalies** |
| 201 | Truncus Arteriosus |
| 202 | Transposition of the Great Vessels |
| 203 | Tetralogy of Fallot |
| 204 | Single Ventricle |
| 205 | Double Outlet Right Ventricle |
| 206 | Complete Atrio-Ventricular Canal |

| Code | Description |
|---|---|
| 207 | Pulmonary Atresia |
| 208 | Tricuspid Atresia |
| 209 | Hypoplastic Left Heart Syndrome |
| 210 | Interrupted Aortic Arch |
| 211 | Total Anomalous Pulmonary Venous Return |
| 212 | Coarctation of the Aorta |
| 213 | Atrial Septal Defect (ASD) |
| 214 | Ventricular Septal Defect (VSD) |
| 215 | Arrhythmias |
| 216 | Ebstein's Anomaly |
| 217 | Pericardial Effusion |
| 218 | Pulmonary Stenosis |
| 219 | Hypertrophic Cardiomyopathy |
| 220 | Penatology of Cantrelli (Thoraco-Abdominal Ectopia Cordis) |
| 200 | Other Cardiac Defect (DESCRIBE) |
| | **Gastro-Intestinal Anomalies** |
| 301 | Cleft Palate |
| 302 | Tracheo-Esophageal Fistula |

| Code | Description |
|---|---|
| 303 | Esophageal Atresia |
| 304 | Duodenal Atresia |
| 305 | Jejunal Atresia |
| 306 | Ileal Atresia |
| 307 | Atresia of Large Bowel or Rectum |
| 308 | Imperforate Anus |
| 309 | Omphalocele |
| 310 | Gastroschisis |
| 311 | Pyloric Stenosis |
| 312 | Annular Pancreas |
| 313 | Biliary Atresia |
| 314 | Meconium Ilius |
| 315 | Malrotation Volvulus |
| 316 | Hirschsprung's Disease |
| 300 | Other Gastro-Intestinal Defect (DESCRIBE) |
| | **Genito Urinary Anomalies** |
| 401 | Bilateral Renal Agenesis |
| 402 | Bilateral Polycystic, Multicystic, or Dysplastic Kidneys |

| Code | Description |
|---|---|
| 403 | Obstructive Uropathy with Congenital Hydronephrosis |
| 404 | Exstrophy of the Urinary Bladder |
| 400 | Other Genito-Urinary Anomalies (DESCRIBE) |
| | **Chromosomal Abnormalities** |
| 501 | Trisomy 13 |
| 502 | Trisomy 18 |
| 503 | Trisomy 21 |
| 505 | Triploidy |
| 504 | Other Chromosomal Anomaly not Listed Above in Codes (DESCRIBE) |
| | **Other Congenital Anomalies** |
| 601 | Skeletal Dysplasia (DESCRIBE) |
| 602 | Congenital Diaphragmatic Hernia |
| 603 | Hydrops Fetalis with anasarca and one or more of the following: ascites, pleural effusion, pericardial effusion |
| 604 | Oligohydramnios sequence including all 3 of the following:<br>(1) Oligohydramnios documented by antenatal ultrasound 5 or more days prior to delivery, (2) evidence of fetal constraint on postnatal physical exam (such as Potter's facies, contractures, or positional deformities of limbs), (3) postnatal respiratory failure requiring endotracheal intubation and assisted ventilation |
| 605 | Inborn Error of Metabolism (DESCRIBE) |

| Code | Description |
|---|---|
| 606 | Myotonic Dystrophy requiring endotracheal intubation and assisted |
| 607 | Conjoined Twins |
| 608 | Tracheal Agenisis or Atresia |
| 609 | Thanatophoric Dysplasia Types 1 and 2 |
| 610 | Hemoglobin Barts |
| | **Pulmonary Anomalies** |
| 801 | Congenital Lobar Emphysema |
| 802 | Congenital Cystic Adenomatoid Malformation |
| 803 | Sequestered Lung |
| 804 | Aveolar Capillary Dysplasia |
| 800 | Other Pulmonary Defect (DESCRIBE) |
| | **Vascular and Lymphatic Anomalies** |
| 901 | Cystic Hygroma |
| 902 | Hemangioma |
| 903 | Sacrococcygeaal Tertoma |
| 904 | Cerebral AV Malformation |
| 900 | Other Lymphatic Anomalies (DESCRIBE) |
| | **Other Diagnoses** |

| Code | Description |
|---|---|
| 121 | Hematologic |
| 122 | Hemolytic Disease of the Newborn (Not ABO) |

## Description of Congenital Anomaly [BDEFECT]

The following congenital anomalies require a detailed description in the space provided on the form:

| | |
|---|---|
| 150 | Other CNS Anomalies |
| 200 | Other Cardiac Anomaly |
| 300 | Other Gastro-Intestinal Anomalies |
| 400 | Other Genito-Urinary Anomalies |
| 504 | Other Chromosomal Anomaly |
| 601 | Skeletal Dysplasia |
| 605 | Inborn Error of Metabolism |
| 800 | Other Pulmonary Anomalies |
| 900 | Other Lymphatic Anomalies |
| 100 | Other Lethal or Life Threatening Anomalies not listed on the form |

If any of the above birth defect codes is specified, describe the defects in detail in the space provided for description. Be specific.

**Do not use general descriptions** such as "multiple congenital anomalies" or "complex congenital heart disease."

**Do not code morbidities as anomalies.** This includes things like: patent ductus arteriosus; necrotizing enterocolitis; retinopathy of prematurity; pneumothorax; intraventricular hemorrhage.

To be considered as lethal or life threatening a congenital anomaly must either: 1) be the primary cause of death, or 2) be treated prior to discharge with specific surgical or medical therapy to correct a major anatomic defect or a life threatening physiologic dysfunction.

The following conditions should NOT be coded as Major Congenital Anomalies:

| |
|---|
| Extreme Prematurity |
| Intrauterine Growth Retardation |
| Small Size for Gestational Age |
| Fetal Alcohol Syndrome |
| Hypothyroidism |
| Intrauterine Infection |
| Cleft Lip without Cleft Palate |
| Club Feet |
| Congenital Dislocation of the Hips |
| Congenital CMV |
| Cystic Fibrosis |
| Persistant Pulmonary Hypertension(PPHN) |
| Limb Abnormalities (missing digits, limbs, or bones) |
| Syndactyly |
| Polydactyly |
| Hypospadias |

| |
|---|
| Patent Ductus Arteriosus |
| Pulmonary Hypoplasia (use code 401 for bilateral renal agenesis, or 604 for oligohydramnios sequence, if applicable) |

## Hyperbilirubinemia

### Item 53. Maximum Level of Bilirubin (mg/dl) Found On THIS Re-Admission [BILILEVEL]

For infants who were previously sent home, and then re-admitted within 28 days of birth only, select the maximum level of bilirubin on THIS re-admission.

- under 25 mg/dl (< 25)
- 25 mg/dl to under 30 mg/dl (25 - < 30)
- 30 mg/dl or higher (≥ 30)

Select **Unknown** if this information cannot be obtained.

Note:

This item is **Not Applicable** if the infant was not previously discharged home and re-admitted within 28 days of birth.

### Item 54. Exchange Transfusion [EXCHANGE]

For infants who were previously discharged home, and then re-admitted within 28 days of birth only, specify whether the infant received an exchange transfusion on THIS re-admission.

Select **Yes** if infant received an Exchange Transfusion during THIS readmission.

Select **No** if infant did NOT receive an Exchange Transfusion during THIS readmission.

Select **Unknown** if this information cannot be obtained.

Note:

This item is **Not Applicable** if the infant was not previously discharged home and re-admitted within 28 days of birth.

### Item 55. Hospital that Discharged Infant Home Prior to THIS Admission [LASTHOSPITAL]

For infants who were previously sent home, and then re-admitted within 28 days of birth, specify the OSHPD code of the last hospital the infant was discharged home from.

Use the list provided to select the correct location of home discharge.

You can use the search function built into the drop-down list to search for any name part of the transport location, or you can use the transport location's OSHPD ID.

Note:

This item is **Not Applicable** if the infant was not previously discharged home and re-admitted within 28 days of birth.

## Initial Disposition

### Item 56. Enteral Feeding at Discharge [ENTFEED]

Select **None** if the infant was not receiving any enteral feedings with either formula milk or human milk at discharge.

Select **Human Milk Only** if the infant was discharged receiving human milk as their only enteral feeding, either by being breast fed and/or by receiving pumped human milk.

Select **Formula Only** if the infant was discharged receiving formula milk as their only enteral feeding.

Select **Human Milk in Combination With Either Fortifier or Formula** if the infant was discharged receiving human milk, plus human milk fortifier and/or formula milk.

Select **Unknown** if this information cannot be obtained.

Note:

a. When completing this item, "Discharge" refers to initial disposition in most cases. If an infant is transported from your center to another hospital and readmitted to your center following transport, update this item based on the infant's enteral feeding status at the time of discharge after readmission.

b. Enteral feedings may be given by any method including breast, bottle, gavage tube, gastrostomy tube, feeding cup, etc. Formula milk includes all standard newborn formulas, premature formulas, and special formulas. Please answer this question based only on the enteral feedings at discharge. Do not consider parenteral feedings when answering this item. For example, if an infant was discharged on IV TPN as well as human milk, the correct response would be Human Milk Only since human milk was the only enteral feeding. If an infant was discharged on IV TPN alone, the correct response would be None since the infant was not receiving any enteral feedings.

c. If an infant were discharged only on sterile water or glucose water, the correct response would be None since the infant was not receiving either formula milk or human milk.

d. Complete the item, Enteral Feeding at Discharge, based on enteral feedings received during the 24 hour period prior to discharge, transport, or death. For infants who remained in your hospital on their first birthday, complete the item, Enteral Feeding at Discharge, based on enteral feedings received on that day.

## Item 57. Initial Disposition From Your Center [FDISP]

Select the appropriate category that reflects the infant's initial disposition at discharge from your hospital. Initial Disposition refers to the first time an infant was discharged from your hospital.

Select **Home** if the infant was discharged to home on or before his/her first birthday from your hospital without ever transporting to another hospital. Complete items 58, 59 and 60; data collection stops at this point. Do not complete the Transport-Out section of the form.

Select **Died** if the infant died on or before his/her first birthday at your hospital prior to being discharged home or transported. Complete items 58, 59 and 60; data collection stops at this point. Do not complete the Transport/ Post-Transport section of the form.

Select **Transported to Another Hospital** if the infant was transported to another hospital or chronic care facility on or before his/her first birthday and before going home. Complete items 58, 59 and 60 of the form.

Select **Still Hospitalized as of First Birthday** if the infant was still at your center on the date of the infant's first birthday. Complete items 58, 59 and 60; data collection stops at this point. Do not complete the Transport/ Post- Transport section of the form.

Select **Unknown** if this information cannot be obtained.

Note:

a. This item refers to the first time that the infant was discharged or transported from your hospital. Discharge occurs when an infant leaves your Center, not when he or she leaves the NICU. Do not change this item based on later dispositions following transport or readmission.

b. Infants transported from one unit to another within your hospital are not considered transports.

## Item 58. Weight at Initial Disposition [DWGT]

Enter the weight in grams obtained on the Date of Initial Discharge, Transport or Death (Item W8 on the Patient Identification Worksheet).

If the answer to Initial Disposition from Your Hospital (Item 57) is Still Hospitalized as of First Birthday, enter the infant's weight in grams on the infant's first birthday. If the infant was not weighed on the date of his/her first birthday, enter the weight in grams from the previous day.

Check **Unknown** if this information cannot be obtained.

Note:

This item refers to the first discharge or transport from your hospital. Do not change this item based on later dispositions following transport or readmission.

## Item 59. Head Circumference at Initial Disposition [HEADCIRC]

Enter the head circumference as recorded in the chart or clinical flow sheets on the Date of Initial Disposition (Item W8 on the Patient Identification Worksheet).

If the head circumference was not recorded on the Date of Initial Disposition, record the most recent head circumference measured up to 7 days prior to discharge.

Record the head circumference at discharge (transport, death, home or 1st birthday) to the nearest tenth of a centimeter. Record 31.24 as "31.2", Record 31.25 as "31.3". You must not leave the tenth of a centimeter blank. If the medical record states that the head circumference is 32 centimeters, please enter "32.0" on the data form.

Check **Not Done** if the head circumference was not recorded on the Date of Initial Disposition or on the 7 days prior to the Date of Initial Disposition.

Check **Unknown** if this information cannot be obtained.

Note:

This item refers to the first discharge or transport from your hospital. Do not change this item based on later dispositions following transport or readmission.

## Item 60. Initial Length of Stay / Discharge Date [LOS1]

Enter the initial discharge date.

Check **Unknown** if this information cannot be obtained.

Note:

a. This item refers to the first discharge or transport from your hospital. Do not change this item based on later dispositions following transport or readmission.

b. If you enter an acceptable date the form will display the implied initial length of stay just below the date entry box.

c. Initial Length of Stay is the number of days from the date the infant was admitted to your hospital until the Date of Initial Discharge, Transport or Death. The Initial Length of Stay is calculated as

([Date of Initial Discharge, Transport or Death] minus [Date of Admission] plus one)

- Infants who die on the day of birth will have an Initial Length of Stay of 1 day.
- The maximum value of Initial Length of Stay is 366 (or 367 if leap day must be added) because tracking ends on the infant's first birthday.
- For inborn infants, the Date of Admission is the Date of Birth. For outborn infants, the Date of Admission is the date the infant was admitted to your center.
- If the Date of Initial Discharge, Transport or Death is "Unknown," Initial Length of Stay will also be "Unknown."

- If an infant is still in your hospital on his or her first birthday, and has not transported or been home, use the date of the infant's first birthday as the Date of Initial Discharge, Transport or Death.

## Transport-Out

### Item 61. Reason for Transport-Out [TRANSCODE]

Select only one answer, the primary reason for transporting the infant to another facility.

Select **ECMO** if the infant was transported to another hospital for extracorporeal membrane oxygenation.

Select **Growth/Discharge Planning** if the infant is transported to another hospital for continuing care in preparation for eventual discharge home. This category includes "back transports" to a hospital closer to the parents' home. This may include cases where the transport is to a tertiary care facility, as long as the purpose of the transport is not the provision of surgical, medical or diagnostic services, or of long- term chronic care, which were unavailable at your hospital.

Select **Medical/Diagnostic Services** if the infant was transported to another hospital to receive medical care or diagnostic tests, which are not available at your Center. If an infant is transported to have a diagnostic work-up and the work-up results in surgery, the reason for transport is still "Medical/Diagnostic Services."

Select **Surgery** if tjje infant is transported to another hospital specifically to have surgery even if surgery is not actually performed after the transport.

Select **Chronic Care** if the infant is transported to an institution for long term chronic care. For these infants, follow up is required only through age one year. At that time, if status has not changed, the record is considered final.

Select **Insurance** if the infant is transported primarily because of restrictions or contractual arrangements with an insurance plan.

Select **Other** if the reason for transport does not meet any of the above criteria.

Select **Unknown** if this information cannot be obtained.

Note:

a. Acute transport out: An infant with medical problems that require acute resolution for survival who is transported in order to obtain medical, diagnostic, or surgical therapy that is not provided, or that cannot be effectively provided due to temporary staffing/census issues, or that can not be provided due to insurance restrictions at the referring hospital is considered acute.

b. Non-Acute transport out: A non-acute transport is an infant whose initial medical/surgical needs have been met, whose condition has been stabilized and who is transported to a facility in order to obtain growth care, discharge planning care, chronic care, and/or hospice care. The medical needs of non-acute transports may range from extensive and extremely

complex care (e.g., an infant with lethal anomalies) to minimal care for feeding and growth (e.g., "maintenance").

c. This item is Not Applicable if the initial disposition for this infant is not "transported." The on-line form only includes the Transport Section and this item if the infant was transported out.

## Item 62. Hospital Location the Infant was Transported to [XFERLOCATION]

Specify the OSHPD code of the hospital the infant was transported to.

Use the list provided to select the correct transport location.

You can use the search function built into the drop-down list to search for any name part of the transport location, or you can use the transport location's OSHPD ID.

Note:

This item is Not Applicable if the initial disposition for this infant is not "transported." The on-line form only includes the Transport-Out Section and this item if the infant was transported out.

## Item 63. Post-Transport Disposition [F2DISP]

Select **Home** if the infant was discharged to home on or before his/her first birthday from the hospital to which he/she was transported. If this answer is selected Items 64-66 on this Form are not applicable; only complete Item 67 of this Form.

Select **Transported Again to Another Hospital** if the infant was transported again to another hospital or to a chronic care facility from the hospital to which he/she was originally transported. If this answer is checked, Items 64-65 of this Form are not applicable; complete Items 66-67 of this Form.

Select **Died** if the infant died on or before his/her first birthday at the hospital to which he/she was transported. If this answer is selected Items 64-66 on this Form are not applicable; only complete Item 67 of this Form.

Select **Readmitted to Any Location in Your Hospital** if an infant is readmitted on or before his/her first birthday (before ever having gone home) to any location in your hospital such as the neonatal intensive care unit, a step-down unit, newborn nursery, intermediate care, pediatric intensive care unit, pediatric ward, etc. If this answer is checked, continue with item 64 on this form.

Select **Still Hospitalized as of First Birthday** if infant was still in the transported To hospital on his/her first birthday. If this answer is selected Items 64-66 on this Form are not applicable; only complete Item 67 of this Form.

Select **Unknown** if this information cannot be obtained.

Note:

This item is Not Applicable if the initial disposition for this infant is not "transported." The on-line form only includes the Transport-Out Section and this item if the infant was transported out.

## Item 64. Weight at Disposition after Re-Admission [F3WGT]

Enter the weight in grams obtained on the date at which the Disposition after Readmission, Item 65, occurred. If the infant was not weighed on the day of death, enter the weight in grams from the previous day.

If the answer to Disposition after Readmission (Item 65) is **Still Hospitalized as of First Birthday**, enter the infant's weight on his or her first birthday. If the infant was not weighed on the date of the first birthday, enter the weight in grams from the previous day.

Check **Unknown** if this information cannot be obtained.

Note:

This item is Not Applicable if the initial disposition for this infant is not "transported." The on-line form only includes the Transport-Out Section and this item if the infant was transported out.

## Item 65. Disposition after Re-Admission [F3DISP]

Select **Home** if the infant was discharged to home on or before his/her first birthday from any location in your hospital after readmission. If this answer is selected, Item 66 of this Form is not applicable; complete Item 67 of this Form.

Select **Died** if the infant died on or before his/her first birthday at any location in your hospital after readmission. If this answer is selected, Item 66 of this Form is not applicable; complete Item 67 of this Form.

Select **Transported Again to Another Hospital** if the infant was transported again to another hospital or to a chronic care facility on or before his/her first birthday after readmission. If this answer is selected, complete Items 66-67 of this Form.

Select **Still Hospitalized as of First Birthday** if infant was still in your hospital as of his/her first birthday. If this answer is selected, Item 66 of this Form is not applicable; complete Item 67 of this Form.

Select **Unknown** if this information cannot be obtained.

Note:

This item is Not Applicable if the initial disposition for this infant is not "transported." The on-line form only includes the Transport-Out Section and this item if the infant was transported out.

## Item 66. Ultimate Disposition [UDISP]

Select **Home** if the infant ultimately went home on or before the first birthday.

Select **Died** if the infant ultimately died on or before the first birthday.

Select **Still Hospitalized as of First Birthday** if the infant was still hospitalized on his/her first birthday, without ever having gone home.

Select **Unknown** if this information cannot be obtained.

Note:

This item is **Not Applicable** if the initial disposition for this infant is not "transported." The on-line form only includes the Transport-Out Section with this item if the infant was transported out.

## Item 67. Total Length of Stay / Final Discharge Date [LOSTOT]

Enter the final discharge date.

Check **Unknown** if this information cannot be obtained.

Note:

a. This item refers to the final discharge date on which the infant either went home, died or was still hospitalized on its first birth day. Do not change this item based on later dispositions following readmission.

b. If you enter an acceptable date the form will display the implied total length of stay just below the date entry box.

c. Total Length of Stay is the number of days from the date the infant was admitted to your and other hospitals until the Date of Final Discharge or Death. For infants discharged home or infants who ultimately died the Total Length of Stay is calculated as

    ([Date of Final Discharge or Death] minus [Date of Admission] plus one)

d. The maximum value of Total Length of Stay is 366 (or 367 if leap day must be added) because tracking ends on an infant's first birthday.

e. For inborn infants, the Date of Admission is the Date of Birth. For outborn infants, the Date of Admission is the date the infant was admitted to your center.

f. If the Date of Final Discharge, Transport or Death is "Unknown," the Total Length of Stay will also be "Unknown."

g. If an infant is still hospitalized on his or her first birthday, use the date of the infant's first birthday as the Date of Final Disposition.

h. This item is Not Applicable if the initial disposition for this infant is not "transported." The on-line form only includes the Transport-Out Section and this item if the infant was transported out.

# NICU Data CPeTS Form

## CPeTS Header

### Center Network ID [HOSPNO]

4-digit NICU ID assigned to your center.

### Infant ID [ID]

Each eligible infant is assigned a record ID beginning with 1. For each new infant, assign the next sequential number. Do not begin the next year reusing 1 or other numbers previously used; instead assign the next sequential number.

Note:

Each record ID in the NICU Database describes one infant's **episode of care** in the hospital.

An **episode of care** is defined as all the care that an infant receives until they are discharged to home. If an infant is moved from your NICU to another unit within your Center (Step-Down Unit, Well Baby Nursery, Pediatrics Ward, Intermediate Care Nursery, PICU, etc.), continue collecting data until discharge to home, transport to another hospital, or death. If the infant is readmitted to the hospital from home, that is considered a new episode of care.

Included in a single **episode of care**:

- Admission and readmission to the NICU, PICU, or any other units within the hospital **("Hospital A")**
- Acute transport to and from other hospitals **("Hospital B")**, code anything that occurred at any prior NICU.
- After care at **Hospital B**, readmission directly to **Hospital A**

### Year of Birth [BYEAR]

Infant Year of Birth.

### Deleted Flag

### Special Transport Situation [T_SPECIALSITUATION]

Check **Delivery Room Attendance** if the receiving hospital's transport team is present at the time of delivery in referring hospital. For this situation, Transport Type is forced to "Delivery Room Attendance" and Items C.20 through C.29 are not applicable.

Check **Transport by referring center (Self Transport)** if the infant is transported by a transport team based at the referring hospital. For this situation, the transport service provider (item C.34) is

forced to "Referring Hospital", items C.16, C.17, C.18 in the Time Sequence section and items C.20 Initial Evaluation through C.28 Initial Evaluation in the Infant Condition section are Not Applicable.

Check **Transport from ER or other non-perinatal settings** if the transport of an infant accomplished from the ER or other non-perinatal settings with or without the assistance of the receiving hospital's neonatal intensive care transport program. In this situation items C.6 through C.8, C.10, C.11, and C.12 time of birth are not applicable. For birth weight (item C.3) if no birth weight is available the current weight should be entered. If not available, the date of birth should be estimated.

Check **Safe Surrender infants** for a transport of an infant, three days old or younger, who has been surrendered by a parent or legal guardian to a hospital emergency room under the California Safe Surrender Baby Law, to a receiving hospital's neonatal intensive care unit. In this situation items C.6 through C.11, C.12 timeof birth, and C.13 are Not Applicable. The birth location (item C.32) is forced to "Safe Surrender". For birth weight (item C.3) enter the current weight. For date of birth, estimate the date of birth.

Note:

If Delivery Room Attendance is checked, none of the other three situations are possible and the check boxes are disabled. If one of the other three situations is checked, Delivery Room Attendance is impossible and the check box for Delivery Room Attendance is disabled.

## Patient Diagnosis

### Item C1. Transport Type [T_TYPE], [T_TYPEDESC]

Select **Requested Delivery Attendance** if neonatal transport team was initially requested to attend the delivery.

Select **Emergent** if the infant was an emergent transport. Immediate response is requested.

Select **Urgent** if response within 6 hours was needed.

Select **Scheduled Neonatal** if the infant transport was planned or scheduled. A scheduled transport is selected for an infant whose initial medical/surgical needs have been met, whose condition has been stabilized and who is transferred to a facility in order to obtain planned diagnostic or surgical intervention. The medical needs may be extensive and extremely complex care (e.g., an infant with lethal anomalies).

Select **Other** if the transport does not conform to other definitions. Describe indication.

Note:

A CPeTS Acute Inter-facility Transport is defined as any infant that requires medical, diagonostic, or surgical therapy that is not provided, or that cannot be provided due to temporary staffing/census issues, or due to insurance restrictions at the referring hospital. CPeTS Acute Inter-facility Transports do not include infants transported solely for feeding and growing or hospice care.

### Item C2. Indication for Transport [T_TRANSCODE]

Select **Medical services** if the infant was transported for medical problems that require acute resolution.

Select **Surgery** if the infant was transported primarily for major invasive surgery (requiring general anesthesia or its equivalent).

## Demographics

### Item C3. Birth Weight [T_BWGT]

Record the birth weight in grams. Since many weights may be obtained on an infant shortly after birth, enter the weight from the Labor and Delivery record if available and judged to be accurate. If unavailable or judged to be inaccurate, use the weight on admission to the neonatal unit or lastly, the weight obtained on autopsy (if the infant expired within 24 hours of birth).

Do **not** use a comma separator as in 1,224. Use only numbers as in 1224.

### Item C4. Best Estimate of Gestational Age [GAWEEKS], [GADAYS]

Starting from 2018, CPQCC has adopted the JC definition of gestational age:

Gestational age is defined as the best obstetrical estimate (OE) of the newborn's gestation in completed weeks based on the birth attendant's final estimate of gestation, irrespective of whether the gestation results in a live birth or a fetal death. This estimate of gestation should be determined by all perinatal factors and assessments such as ultrasound, but not the newborn exam. Ultrasound taken early in pregnancy is preferred (source: American College of Obstetricians and Gynecologists reVITALize Initiative).

Source: https://manual.jointcommission.org/releases/TJC2017A/DataElem0265.html

In the cases where there is no prenatal care or there are significant discrepancies between the obstetrical gestational age and neonatal gestational age (i.e., over two weeks), please determine the gestational age from the neonatologist exam.

Select the gestational age in completed weeks and days.

Select **Unknown** if the information cannot be obtained.

Note:

Entering or updating gestational age will affect the collection of several items on this form. For instance, for NICUs not participating in the expanded VON data collection, item 51 (HIE) will only be unlocked if an infant's gestational age has been entered.

### Item C5. Infant Sex [SEX]

Select **Male** or **Female**.

Select **Unknown** if sex cannot be determined or is unknown.

## Congenital Anomalies Diagnosed Prenatally

### Item C6a. Congenital anomalies that were diagnosed prenatally [T_CMAL]

Select **Yes** if the infant had one or more of the congenital anomalies listed diagnosed prenatally. Use the list of codes to check off the congenital anomalies present among those listed. You may check up to 5 defects.

Select **Yes** if the infant had congenital anomalies diagnosed prenatally that are not explicitly listed on the form, which were lethal, or life threatening. In this case, use the defect code of "100" (in addition to any other applicable code) and describe the defects in detail in the space provided for description. To be considered as lethal or life threatening a congenital anomaly must either: 1) be the primary cause of death, or 2) be treated prior to discharge with specific surgical or medical therapy to correct a major anatomic defect or a life threatening physiologic dysfunction.

Select **No** if an infant was not diagnosed prenatally as having one or more of the congenital anomalies listed on the form and did not have an unlisted congenital anomaly, which was lethal or life threatening.

Select **Unknown** if this information cannot be obtained.

### Birth Anomaly Codes 1-5 [T_BDCD1-T_BDCD5]

If a congenital anomaly was diagnosed prenatally, specify up to 5 birth defects from the **Congenital Anomaly list**:

| Code | Description |
|---|---|
| 100 | Lethal or Life-Threatening Congenital Anomaly Not Listed Below (DESCRIBE) |
| | **Central Nervous System Anomalies** |
| 101 | Anencephaly |
| 102 | Meningomyelocele |
| 103 | Hydranencephaly |
| 104 | Congenital Hydrocephalus |
| 105 | Holoprosencephaly |

| Code | Description |
|---|---|
| 106 | Microcephaly |
| 107 | Hypopituitary |
| 108 | Septic Optic Dysplasia |
| 109 | Encephalocele |
| 150 | Other CNS Defect (DESCRIBE) |
| | **Congenital Heart Anomalies** |
| 201 | Truncus Arteriosus |
| 202 | Transposition of the Great Vessels |
| 203 | Tetralogy of Fallot |
| 204 | Single Ventricle |
| 205 | Double Outlet Right Ventricle |
| 206 | Complete Atrio-Ventricular Canal |
| 207 | Pulmonary Atresia |
| 208 | Tricuspid Atresia |
| 209 | Hypoplastic Left Heart Syndrome |
| 210 | Interrupted Aortic Arch |
| 211 | Total Anomalous Pulmonary Venous Return |
| 212 | Coarctation of the Aorta |

| Code | Description |
|---|---|
| 213 | Atrial Septal Defect (ASD) |
| 214 | Ventricular Septal Defect (VSD) |
| 215 | Arrhythmias |
| 216 | Ebstein's Anomaly |
| 217 | Pericardial Effusion |
| 218 | Pulmonary Stenosis |
| 219 | Hypertrophic Cardiomyopathy |
| 220 | Penatology of Cantrelli (Thoraco-Abdominal Ectopia Cordis) |
| 200 | Other Cardiac Defect (DESCRIBE) |
| | **Gastro-Intestinal Anomalies** |
| 301 | Cleft Palate |
| 302 | Tracheo-Esophageal Fistula |
| 303 | Esophageal Atresia |
| 304 | Duodenal Atresia |
| 305 | Jejunal Atresia |
| 306 | Ileal Atresia |
| 307 | Atresia of Large Bowel or Rectum |
| 308 | Imperforate Anus |

| Code | Description |
|---|---|
| 309 | Omphalocele |
| 310 | Gastroschisis |
| 311 | Pyloric Stenosis |
| 312 | Annular Pancreas |
| 313 | Biliary Atresia |
| 314 | Meconium Ilius |
| 315 | Malrotation Volvulus |
| 316 | Hirschsprung's Disease |
| 300 | Other Gastro-Intestinal Defect (DESCRIBE) |
| | **Genito Urinary Anomalies** |
| 401 | Bilateral Renal Agenesis |
| 402 | Bilateral Polycystic, Multicystic, or Dysplastic Kidneys |
| 403 | Obstructive Uropathy with Congenital Hydronephrosis |
| 404 | Exstrophy of the Urinary Bladder |
| 400 | Other Genito-Urinary Anomalies (DESCRIBE) |
| | **Chromosomal Abnormalities** |
| 501 | Trisomy 13 |
| 502 | Trisomy 18 |

| Code | Description |
|---|---|
| 503 | Trisomy 21 |
| 505 | Triploidy |
| 504 | Other Chromosomal Anomaly not Listed Above in Codes |
| | **Other Congenital Anomalies** |
| 601 | Skeletal Dysplasia (DESCRIBE) |
| 602 | Congenital Diaphragmatic Hernia |
| 603 | Hydrops Fetalis with anasarca and one or more of the following: ascites, pleural effusion, pericardial effusion |
| 604 | Oligohydramnios sequence including all 3 of the following:<br>(1) Oligohydramnios documented by antenatal ultrasound 5 or more days prior to delivery, (2) evidence of fetal constraint on postnatal physical exam (such as Potter's facies, contractures, or positional deformities of limbs), (3) postnatal respiratory failure requiring endotracheal intubation and assisted ventilation |
| 605 | Inborn Error of Metabolism (DESCRIBE) |
| 606 | Myotonic Dystrophy requiring endotracheal intubation and assisted |
| 607 | Conjoined Twins |
| 608 | Tracheal Agenisis or Atresia |
| 609 | Thanatophoric Dysplasia Types 1 and 2 |
| 610 | Hemoglobin Barts |
| | **Pulmonary Anomalies** |

| Code | Description |
|---|---|
| 801 | Congenital Lobar Emphysema |
| 802 | Congenital Cystic Adenomatoid Malformation |
| 803 | Sequestered Lung |
| 804 | Aveolar Capillary Dysplasia |
| 800 | Other Pulmonary Defect (DESCRIBE) |
| | **Vascular and Lymphatic Anomalies** |
| 901 | Cystic Hygroma |
| 902 | Hemangioma |
| 903 | Sacrococcygeaal Tertoma |
| 904 | Cerebral AV Malformation |
| 900 | Other Lymphatic Anomalies (DESCRIBE) |
| | **Other Diagnoses** |
| 121 | Hematologic |
| 122 | Hemolytic Disease of the Newborn (Not ABO) |

## Description of Birth Defect (if needed) [T_BDEFECT]

The following congenital anomalies require a detailed description in the space provided on the form:

| | |
|---|---|
| 150 | Other CNS Anomalies |
| 200 | Other Cardiac Anomaly |

| | |
|---|---|
| 300 | Other Gastro-Intestinal Anomalies |
| 400 | Other Genito-Urinary Anomalies |
| 504 | Other Chromosomal Anomaly |
| 601 | Skeletal Dysplasia |
| 605 | Inborn Error of Metabolism |
| 800 | Other Pulmonary Anomalies |
| 900 | Other Lymphatic Anomalies |
| 100 | Other Lethal or Life Threatening Anomalies not listed on the form |

If any of the above birth defect codes is specified, describe the defects in detail in the space provided for description. Be specific. Do not use general descriptions such as "multiple congenital anomalies" or "complex congenital heart disease." To be considered as lethal or life threatening a congenital anomaly must either: 1) be the primary cause of death, or 2) be treated prior to discharge with specific surgical or medical therapy to correct a major anatomic defect or a life threatening physiologic dysfunction.

The following conditions should NOT be coded as Major Congenital Anomalies:

| |
|---|
| Extreme Prematurity |
| Intrauterine Growth Retardation |
| Small Size for Gestational Age |
| Fetal Alcohol Syndrome |
| Hypothyroidism |
| Intrauterine Infection |
| Cleft Lip without Cleft Palate |

| |
|---|
| Club Feet |
| Congenital Dislocation of the Hips |
| Congenital CMV |
| Cystic Fibrosis |
| Persistant Pulmonary Hypertension(PPHN) |
| Limb Abnormalities |
| Syndactyly |
| Polydactyly |
| Hypospadias |
| Patent Ductus Arteriosus |
| Pulmonary Hypoplasia (use code 401 for bilateral renal agenesis, or 604 for oligohydramnios sequence, if applicable) |

## Maternal History

## Item C7. Maternal Birth Date and Age

## Maternal Birth Date [MDATE]

Enter the mother's birth date as mm-dd-yyyy. Note that the on-line form allows "short" date entries and tries to convert them to the correct date. For instance, entering 12111989 will be converted to 12-11-1989.

Provided a correct maternal birth date is provided, the corresponding maternal age at the time of the delivery will be auto-populated using the entered infant date of birth.

Select **unknown** if the mother's date of birth is unknown.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Maternal Age [MAGE]

If the mother's date of birth is unknown, but the mother's age at the time of the delivery is known, enter the mother's age at time of delivery. Give her age in completed years; meaning that a woman who is 30 years and 364 days old should be recorded as 30 years old, not 31.

Check **unknown** if the mother's age at time of the delivery is unknown.

Note:

For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item C8a. Antenatal Steroids Used [ASTER]

Select **Yes** if corticosteroids were administered IM or IV to the mother during pregnancy at any time prior to delivery. Corticosteroids include betamethasone, dexamethasone, and hydrocortisone.

Select **No** if antenatal corticosteroids were not administered to the mother during pregnancy at any time prior to delivery or if there is no documentation in the medical record that antenatal steroid therapy was initiated before delivery.

Select **Unknown** if this information cannot be obtained (e.g. missing records from a referring hospital).

Note:

a. For calculating the Joint Commission measure, "**Unknown**" will count as a "**No**."

b. For the Delivery and Maternal History section, enter maternal and perinatal data on the woman who delivered the infant even if she is a gestational carrier.

## Item C8b. Antenatal Magnesium Sulfate [ANCMAMAGSULF]

Select **Yes** if if **Magnesium Sulfate** was administered intravenously to the mother during pregnancy at any time prior to delivery for any reason.

Select **No** if Magnesium Sulfate was not administered intravenously to the mother during pregnancy at any time prior to delivery.

Select **Unknown** if this information cannot be obtained.

Note:

a. Enter this item such as it refers to the woman who delivered the infant even if she was a gestational carrier.

b. For the CPeTS form, this item is Not Applicable and grayed if the infant was transported from the ER, other non-perinatal setting or if this form pertains to a Safe Surrender situation.

### Surfactant

#### Item C9a. Surfactant in the DR [DRSURF]

Select **Yes** if surfactant was administered to the infant in the delivery room or as part of the stabilization immediately after birth even if that occurred in a location other than the delivery room.

Select **No** if surfactant was not administered when the infant was in the delivery room or as part of the stabilization immediately after birth.

Select **Unknown** if this information cannot be obtained.

Note:

The initial resuscitation and stabilization of infants immediately after birth may occur in locations other than a delivery room. These may include a designated resuscitation area, hospital room, emergency room, operating room, ambulance, etc. If surfactant is administered during stabilization and resuscitation immediately following birth, the answer to this question is Yes regardless of location.

If the stabilization immediately after birth occurs in a delivery room, resuscitation room or other location and the infant is then transported to the NICU for further stabilization during which surfactant is administered, select No.

#### Item C9b. Surfactant Treatment [T_SURFX]

Select **Yes** if the infant received an exogenous surfactant at any time. If the answer to item Was Surfactant given in the Delivery Room? is Yes, the answer to this item is Yes.

Select **No** if the infant never received an exogenous surfactant.

Select **Unknown** if this information cannot be obtained.

## Time Sequence

#### Item C10. Date/Time of Maternal Admission to Labor & Delivery [T_MADMDATE]

Enter the date and time using a 24-hour clock of the mother's admission to the hospital perinatal department.

If mother was admitted directly to Labor & Delivery Unit, state this date and time.

If mother was initially admitted to the Emergency Department, received care and either delivered there or was subsequently transported to the Labor & Delivery Unit, state the date and time admitted to the Emergency Department.

Note:

This item is Not Applicable and grayed if the infant was transported from the ER, other non-perinatal setting or if this form pertains to a Safe Surrender situation.

### Item C12. Date and Time of Birth [T_BDATE]

Enter the infant's date of birth and infant's time of birth using a 24-hour clock.

Note:

This time of birth is Not Applicable and grayed if the infant was transported from the ER, other non-perinatal setting or if this form pertains to a Safe Surrender situation.

### Item C13. Date and Time of Surfactant Treatment [T_SURFXDATE]

If the infant was treated with surfactant enter the date and time using a 24-hour clock when the first dose of surfactant was administered.

Note:

This item is Not Applicable and grayed out if the infant was not treated with surfactant, i.e., if the responses to items C.9a and C.9b are both "No".

### Item C14. Date/Time of Referral (and Referring Hospital Evaluation) [T_REFDATE]

Enter the date and time of the initial referral communication between referring and receiving providers/facilities. The time should be reported on the 24-hour clock.

Note that the referral date/time is used as date/time of referral evaluation; the referral evaluation should be done within 15 minutes of the referral date/time.

### Item C15. Date/Time of Acceptance [T_ACCDATE]

Enter the date and time of the transport acceptance. The time should be reported on the 24-hour clock.

### Item C16. Date/Time of Transport Team Departure for Referring Hospital [T_TTDEPDATE]

Enter the date and time that the transport team departed from Transport Team Office/NICU for the referring hospital. The time should be reported on the 24-hour clock.

Note:

This item is not applicable and grayed out if the infant was transported by the referring hospital (self-transport).

### Item C17. Date/Time of Transport Team Arrival at Referring Hospital [T_TTARRDATE]

Enter the date and time that the transport team arrived at the referring hospital/Patient Bedside. The time should be reported on the 24-hour clock.

Note:

This item is not applicable and grayed out if the infant was transported by the referring hospital (self-transport).

### Item C18. Date/Time of Initial Evaluation by Transport Team within 15 Minutes of Arrival at Referring Hospital [T_EVALINITDATE]

Enter the date and time at which the transport team evaluated the infant after arriving at the referring location. The time should be reported on the 24-hour clock.

Note:

This item is not applicable and grayed out if the infant was transported by the referring hospital (self-transport).

### Item C19. Date/Time of NICU Evaluation within 15 Minutes of Arrival at Receiving Hospital [T_EVALNICUDATE]

Enter the date and time of the infant's NICU evaluation within 15 minutes of arrival at the Receiving Hospital. The time should be reported on the 24-hour clock.

Note:

This item along with the date of birth is used to populate item 7c (age in days at NICU admission) on the A/D form for this infant.

## Infant Condition

### Responsiveness [T_RESP1-T_RESP3]

This infant's responsiveness should be provided for the TRIPS score timing points:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

Select **None, Seizure, Muscle Relaxant** if the infant demonstrated no responsiveness, seizures or received muscle relaxants. Note that seizures include compelling clinical evidence of seizures, or of focal or multifocal, clonic or tonic seizures, as well as, EEG evidence of seizures, regardless of clinical status.

Select **Lethargic, No cry** if the infant appeared lethargic or had no cry.

Select **Vigorously withdraws, Cry** if the infant vigorously withdraws or cries.

Note:

If the infant dies before it is admitted to the NICU at the receiving hospital, a CPeTS form is not necessary.

## Temperature and Cooling

This infant's temperature and cooling status should be assessed for the TRIPS score timing points:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

## Temperature [T_TEMP1-T_TEMP3]

If the infant's core body temperature was measured and recorded for each of the three dates/times above, enter the infant's temperature in degrees centigrade to the nearest tenth of a degree. Note that two data entry boxes for temperature are provided, one for centigrades and one for Fahrenheit. Make sure to enter the measured temperature into the correct box.

If the attempted reading is lower than the thermometer could measure, record the lowest temperature on the thermometer.

Use rectal temperature or, if not available, esophageal temperature, tympanic temperature or axillary temperature, in that order.

Check **Unknown** if the infant's body temperature was not measured.

Check **Too Low to Register** for situations in which the infant's temperature is too low to register on the thermometer used.

## Hypothermic Therapy [T_COOLING1-T_COOLING3]

Cooling is defined as an infant who is administered hypothermic therapy. Cooling is the status in the time period just before the TRIPS score timing points.

Select **Yes** if the infant is cooled prior to the relevant TRIPS score timing point.

Select **No** if the infant is not cooled prior to the relevant TRIPS score timing point.

Select **Unknown** of this information cannot be obtained.

## Method of Hypothermic Therapy [T_COOLINGMETHOD1-T_COOLINGMETHOD3]

Select **Passive** if cooling was intentionally withholding standard temperature maintenance strategies for the purpose of achieving low temperature. If passive cooling is only used until head or body cooling is started, please select either head or body cooling.

Select **Selective Head** if active cooling was restricted to the head and brain as an intervention to reduce the temperature by exposing the head to lower than environmental temperature. Specially designed head cooling devices, other cooling devices and ice packs applied to the head would be considered active cooling of the head and brain. Passive exposure to environmental temperature or cooling of the face for the treatment of supraventricular tachycardia is not considered active cooling of the head and brain.

Select **Whole Body** if active cooling of the body that is not restricted to the head and brain as an intervention to reduce the core body temperature and temperature of the brain by exposing the body to lower than environmental temperature. Whole body cooling may include cooling of the head in addition to the rest of the body. Cooling blankets, other cooling devices and ice packs applied to the body would be considered active cooling of the whole body. Passive exposure to environmental temperature is not considered active cooling of the whole body.

Select **Other** if cooling is actively administered in some other way that is not provided as an option.

Select **Unknown** if this information cannot be obtained.

Note:

If the infant is administered several methods of hypothermic therapy, record the last type of hypothermic therapy administered prior to the relevant TRIPS score timing point.

This item is **Not Applicable** if the infant was not cooled.

## Heart Rate [T_HEARTRATE1-T_HEARTRATE3]

Enter the infant's heart rate ranging from 0 to 400 for the TRIPS score timing points:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

## Respiratory Rate [T_RESPRATE1-T_RESPRATE3]

Enter the infant's respiratory rate ranging from 0 to 400 for the TRIPS score timing points:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

Note:

This rate may be spontaneous or assisted by a ventilator.

## Oxygen Saturation ($SaO_2$) [T_SAO21-T_SAO23]

Enter the infant's average oxygen saturation as a percentage ranging from 0 to 100 for the TRIPS score timing points; check **Unknown** if this information cannot be obtained:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

## Respiratory Status [T_RESPSTATUS1-T_RESPSTATUS3]

Select the infant's respiratory status for the TRIPS score timing points:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

Select **Respirator** if the infant was on a respirator.

Select **Apnea, gasping, intubated but not on respirator** if the infant had severe respiratory complications, including apnea, gasping, or was intubated but not on mechanical respirator.

Select **Other** for all other situations, including no or mild respiratory complications.

## Inspired Oxygen Concentration ($FiO_2$) [T_FIO21-T_FIO23]

If the infant was on a respiratory, enter the infant's inspired oxygen concentration ($FiO_2$) ranging from 21% to 100% for the TRIPS score timing points; check **Unknown** if this information cannot be obtained:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

Note:

This item is Not Applicable and disabled if the infant was not on a respirator at the relevant TRIPS score timing point.

## Respiratory Support [T_VENTMODE1-T_VENTMODE3]

Select the type of respiratory support an infant received at each of the the TRIPS score timing points:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

Select **None** if none of the methods of respiratory support listed below were used.

Select **Hood/Nasal Cannula (NC), Blowby** if the infant had spontaneous breathing and was supported using an oxygen hood, nasal cannula or blowby.

Select **Nasal CPAP (NCPAP)** if the infant was provided with continuous positive airway pressure (CPAP) using nasal CPAP.

Select **Endotracheal Tube (ETT)** if the infant was ventilated using an endotracheal tube (ETT). Do not enter ETT if an endotracheal tube was placed only for suctioning and assisted ventilation was not given through the tube.

## Blood Pressure

Enter the blood pressure items for the the TRIPS score timing points:

1. At the time of referral for transport at the referring hospital
2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

## Systolic Blood Pressure [T_BPSYS1-T_BPSYS3]

Enter systolic blood pressure for the the TRIPS score timing points.

Check **Unknown** if the information item cannot be obtained.

Check **Too Low** if the blood pressure cannot be measured.

## Diastolic Blood Pressure [T_BPDIA1-T_BPDIA3]

Enter diastolic blood pressure for the the TRIPS score timing points.

Check **Unknown** if the information item cannot be obtained.

Check **Too Low** if the blood pressure cannot be measured.

## Mean Blood Pressure [T_BPMEAN1-T_BPMEAN3]

Enter mean blood pressure for the the TRIPS score timing points.

Check **Unknown** if the information item cannot be obtained.

Check **Too Low** if the blood pressure cannot be measured.

## Use of Pressors [T_PRESSOR1-T_PRESSOR3]

For each TRIPS score timing point, indicate whether the infant received pressors:

1. At the time of referral for transport at the referring hospital

2. At the time of initial transport team evaluation at the referring hospital
3. At the time of NICU admission at the receiving hospital

Select **Yes** if the infant received vasopressors.

Select **No** if the infant did not receive vasopressors.

## Referral Process

### Item C30. Referring Hospital [T_REFERRINGHOSPITAL]

Select the referring hospital from the selection list.

The list on the form is sorted in alphabetical order by hospital name. You can use the search function built into the drop-down list to search for any name part of the transport location, or you can use the transport location's OSHPD ID.

### Item C31a. Was the infant previously transported? [T_FIRSTTRANS]

Select **Yes** if the infant was transported previously from another hospital to the referring hospital.

Select **No** if the infant was not transported previously from another hospital to the referring hospital.

Select **Unknown** if this information cannot be obtained.

### Item C31b. Previous Transport Referring Hospital [T_PREVHOSPITAL]

Select the hospital that referred the prior transport from the selection list.

The list on the form is sorted in alphabetical order by hospital name. You can use the search function built into the drop-down list to search for any name part of the transport location, or you can use the transport location's OSHPD ID.

### Item C32. Location of Birth [T_BIRTHLOCATION]

Select the birth location from the selection list.

The list on the form is sorted in alphabetical order by hospital name. You can use the search function built into the drop-down list to search for any name part of the transport location, or you can use the transport location's OSHPD ID.

### Item C33. Transport Team On-Site Leader [T_TEAMLEADER]

Select one of the following responses that best describes the transport leader's professional designation:

Select **Sub-specialist MD** for neonatologist.

Select **Pediatrician** for pedicatrician.

Select **Other MD/Resident** for any other physician or pediatric/neonatal resident.

Select **Neonatal Nurse Practioner** for neonatal nurse practitioner.

Select **Transport Specialist** for a registered nurse or respiratory therapist specializing in neonatal/pediatric transport services, practicing under standardized procedures.

Select **Nurse** for neonatal registered nurse.

## Item C34a. Transport Team Base [T_TEAMBASE]

Select **Receiving Hospital** if the transport team is part of the receiving hospital's staff (including those used for both Neonatal and Pediatric Transports and based in NICU, Pediatrics, PICU, Emergency Department, etc.).

Select **Contract Service** if the transport team is not on staff at the receiving hospital. This may include contracted transport teams from another facility inside or outside of the hospital system of the receiving facility.

Select **Referring Hospital** if the transport team is part of the referring hospital's staff.

Note:

The "Referring Hospital" option is only available for Self-Transports.

## Item C34b. Transport Team Contract Service Provider [T_TEAMBASECS]

If the infant was transported by Contract Service Provider, select the provider from the selection list.

The list on the form is sorted in alphabetical order by provider name. You can use the search function built into the drop-down list to search for any name part of the transport location, or you can use the transport location's OSHPD ID.

Note:

This item is Not Applicable and disabled if the transport team was based at the referring or receiving hospital.

## Item C35. Mode of Transport [T_TRANSMODE]

Select **Ground** for ambulance transport or ambulatory transport (eg, crossing bridge from one hospital to another immediately adjacent facility).

Select **Helicopter** for rotor-wing transport.

Select **Fixed Wing** for airplane transport.

Note:

Select the primary type of transport used.

For example, a patient was transported by ambulance to airfield or heliport for helicopter transport, would be coded as Helicopter.

# NICU Data CCS Form

## Introduction

The NICU Data on-line CCS form collects all the items that were previously collected via the CCS supplemental form. To take advantage of your NICU Database submissions, you are able to compare some of the fields based on your submissions. Underneath each CCS number you are required to enter, the form is showing in a teal small font the count based on your NICU Database submissions and the rule for the cell (≥ or =). For instance, the total number of deaths in your NICU prior to and including the 28th Day of life for birth weight group 501 to 750 grams that is entered in your CCS form should be equal (=) to the number of infant deaths in your NICU in this birth weight group in the NICU Database.

In contrast to prior years, **starting from 2013 the CCS form should no longer count admissions, but the number of infants admitted to a NICU**. In other words, if an infant is admitted multiple times to a NICU without being discharged home, this infant contributes a count of 1 to all applicable tables in Sections A through D. For instance, if an infant was born in your center, you would count her/him in Table A (Hospital Births and Deaths of Infants Born in ) and in Table D (Hospital Births and Inborn Admissions of Infants Born in by Gestational Age).

If this same infant spent time in your NICU, then was transported out, you would also count her/him in Table C (Total transports from your NICU of Infants Born in ).

If this same infant was re-admitted back to your hospital's NICU without being discharged home, you would **not** count her/him in Table B (Total Admissions to Your NICU of Infants Born in ).

In all, this infant is counted 3 times on the CCS supplemental form.

However, for the situation in which a baby is born at your center, discharged home and then after the home discharge re-admitted to your center, you need to count this second episode of care in Table B as an Outborn Admission to your NICU. This infant is not counted in Tables A and D as inborn NICU admission. If the infant was transported from your NICU to another hospital during the second episode of care, then this infant is counted in Table C.

The on-line form will automatically populate all parts of the form that have a shaded background. You will not need to enter these items as they are calculated based on your form entries.

You may fill out only parts of the form and submit them to save what you entered. This feature allows you to start filling out the form and returning to it later should you get interrupted or should you need to find more information.

At the bottom of the form, several "buttons" allow the checking of the form's consistency and its pending items. During form entry and as part of the consistency check, fields that are considered in error appear in a red font.

**Note that in contrast to the NICU Database DRD, A/D and CPeTS forms, the CCS form DOES allow you to submit erroneous/inconsistent data.** The reason is that while filling out the CCS form you might discover that you have not submitted all NICU Database eligible infants. You

then would update your NICU Database to include this infant thereby removing the inconsistency from your CCS form.

The CCS form allows the importing of the number of births by birth weight in Section A and the number of births by gestational age in Section D from the California Department of Public Health issued Vital Statistics Birth file through a link to the CMQCC Maternal Data Center.

For those members who are using the **Optional NICU Admits Database (NAD)**, the CCS form's section A through F can be populated almost entirely from that Database. The CCS form includes buttons at the bottom of the form that facilitate the import from the Optional NAD. Please refer to additional documentation provided with the Optional NAD.

## Section A. Hospital Births and Deaths of Infants Born in 2019 by Birth Weight

### Live Births

Enter the total number of live births in your hospital during for each of the indicated birth weight groups. The total will be updated to reflect your entries.

The CCS form includes a button at the bottom that allows you to import the number of births by birth weight from the California Department of Public Health issued Vital Statistics Birth file through a link to the CMQCC Maternal Data Center.

Note:

- An infant born in the host facility and then admitted to imbedded NICUs (e.g., a NICU owned and managed by one organization located within a delivery facility owned and managed by another hospital) is considered an inborn infant.
- Satellite NICUs are asked to report the total number of live births at the hospital in which they operate because it provides important contextual information. For the same reason, CCS is requesting the NAE for the hospital in which the satellite operates – because such contextual information is necessary to make sense of, and evaluate, pertinent resource use and outcomes in the NICU serving that birth population.
- For Children's Hospitals with no inborns, the total number of live births should be entered as 0.

### NICU Deaths

The counts in this row will be automatically updated based on the sum of your entries for the number of deaths in your NICU prior to and on Day 28 (NICU neonatal deaths) and the number of deaths in your NICU after Day 28 (NICU postneonatal deaths). Delivery Room Deaths are not included.

### NICU Neonatal Deaths

Enter the number of infants born in who died while under the care of the NICU staff, regardless of the location in your hospital, and who died within 27 days, 23 hours, and 59 minutes of birth (neonatal deaths).

In these counts include the deaths of infants who were not born in your center, i.e., outborn babies who were transported-into your NICU. Do not include stillborn infants. Do not include infants who expired within 12 hours of birth and prior to NICU admission.

The web form shows in small print a comparison of the total in your CCS form to the NICU Database total. To be consistent with your NICU Databse, your entry should satisfy the indicated rule; otherwise the CCS data entry field will be flagged as in error.

Because CCS does not have a > 400 gram or > 22 0/7 week cut off point the number of NICU deaths under 401 grams submitted to CCS might exceed NICU Database counts shown on the CCS form.

### NICU Postneonatal Deaths

Enter the number of infants born in who died while under the care of the NICU staff, regardless of the location in your hospital, and who died after 28 days and 0 hours of birth (postneonatal deaths).

In these counts include the deaths of infants who were not born in your center, i.e., outborn babies who were transported-into your NICU. Do not include stillborn infants. Do not include infants who expired within 12 hours of birth and prior to NICU admission.

Because infants might be admitted to your center after Day 28 and therefore not be eligible for the NICU Database, the number of NICU deaths after the 28th day of life submitted to CCS might exceed NICU Database counts shown on the CCS form. Furthermore, because CCS does not have a > 400 gram or > 22 0/7 week cut off point the number of NICU deaths under 401 grams submitted to CCS might exceed NICU Database counts shown on the CCS form.

### Delivery Room Deaths

Enter the number of infants born in who died in the delivery room or the initial resuscitation area within 12 hours of birth and prior to NICU admission.

Because CCS does not have a > 400 gram or > 22 0/7 week cut off point the number of delivery room deaths under 401 grams submitted to CCS might exceed NICU Database counts shown on this form.

## Section B. Total Admissions to Your NICU of Infants Born in 2019 by Birth Weight

### CCS NICU Admissions by Birth Weight

The cells in this row will be updated based on the sum of your entries for inborn infants admitted to your NICU, and acute and non-acute transports into your NICU.

### Inborn NICU Admissions by Birth Weight

Enter the total number of inborn infants who were admitted to your NICU after birth and without being previously discharged home or transported out by birth weight. The infant has to be born in your hospital on the same stay as it was admitted to your NICU. In other words, if an infant was born in and discharged from your hospital, later re-admitted to your hospital and admitted to your NICU, it should be counted as an Outborn Admission.

### Outborn NICU Admissions by Birth Weight

The cells in this row will be updated based on the sum of your entries in the next two rows for acute and non-acute outborn admissions to your NICU.

### Acute Outborn NICU Admissions by Birth Weight

An Acute Outborn Admission is:

1. an acute transport-in to your NICU of an inpatient from another facility; or
2. an acute admission to your NICU of any infant that is admitted from home or another non-hospital location.

An Acute Outborn Admission is defined as the admission of an infant with medical problems that require urgent care. If the infant is an acute outborn admission then the care that is medical, diagnostic, or surgical therapy is not provided, or cannot be provided due to temporary staffing/census issues.

A transport is considered acute if the primary reason for the transport was not for feeding/growing or convalescent reasons. Acute outborn admissions occur to get resources that are not available at the sending hospital.

### Non-Acute Outborn NICU Admissions by Birth Weight

A Non-acute Outborn Admission is:

1. a non-acute transport-in to your NICU of an inpatient from another facility; or
2. a non-acute admission to your NICU of any infant that is admitted from home or another non-hospital location.

A non-acute Outborn Admission is an admission for growth care, discharge planning care, chronic care, convalescent care, and/or hospice care. If an infant is a non-acute transport-in, then the infant's initial medical, diagnostic, and surgical needs have been met and the infant's condition has been stabilized. The medical needs of non-acute transports-in may range from extensive and extremely complex care to minimal care for feeding and growth.

## Section C. Total Transfers-Out from Your NICU of Infants Born in 2019 by Birth Weight

### Transports-Out by Birth Weight

The cells in this row will be updated based on the sum of your entries for acute and non-acute transports out of your NICU in the next two rows.

### Acute Transports-Out by Birth Weight

Enter the number of infants by birth weight who were transported out for acute reasons.

An infant with medical problems that require acute resolution for survival who is transported-out in order to obtain medical, diagnostic, or surgical therapy that is not provided, or that cannot be provided due to temporary staffing/census issues. A transport is considered acute if the primary reason for the transport was NOT for feeding/growing or convalescent reasons. Acute transports-out occur to get resources that are not available at your hospital.

### Non-Acute Transports Out by Birth Weight

Enter the total number of infants by birth weight who were transported out of your NICU for non-acute reasons.

Non-acute Transports-Out are infants whose initial medical/surgical needs have been met, whose condition has been stabilized and who is transported-out to a facility in order to obtain growth care, discharge planning care, chronic care, and/or hospice care. The medical needs of non-acute transports-out may range from extensive and extremely complex care to minimal care for feeding and growth.

## Section D. Section D. Hospital Births and NICU Inborn Admissions of Infants Born in 2019 by Gestational Age

### CCS NICU Admissions by Gestational Age

Enter the total number of live births in your hospital during for each of the indicated gestational age groups. The total is updated to reflect your entries.

The CCS form includes a button at the bottom that allows you to import the number of births by gestational age from the California Department of Public Health issued Vital Statistics Birth file through a link to the CMQCC Maternal Data Center.

Note:

a. For *Gestational Age:* use the best estimate of gestational age in weeks and days 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.

b. An infant born in the host facility and then admitted to imbedded NICUs (e.g. a NICU owned and managed by one organization located within a delivery facility owned and managed by another hospital) is considered an inborn infant.

### Inborn NICU Admissions by Gestational Age

Enter the total number of inborn infants who were admitted to your NICU after birth and without being previously discharged or transported out by gestational age. The infant has to be born in your hospital on the same stay as it was admitted to your NICU. In other words, if an infant was born in and discharged from your hospital, later re-admitted to your hospital and admitted to your NICU, it should not be counted under Inborn Admissions.

## Section E. Average Daily Census in your NICU, Newborn Antibiotic Exposures (NAE) and Antibiotic Use Rate (AUR) in 2019

### Average Daily Census

The average daily census quantifies occupancy of all on-site licensed NICU beds.

To calculate the average daily census, enter the total number of patient days in for all on-site licensed NICU beds. The average daily census is calculated as the ratio of the total number of patient days in and the number of days in the year .

Note:

a. On-site does not include other hospitals or satellite hospitals.

b. The total number of patient days of your CPQCC infants should be a lower boundary for the quantity entered.

### Neonatal Antibiotic Exposures

The Newborn Antibiotic Exposures (NAE) count is a count of all inborn newborns – in any location in your hospital or co-located hospital – who have received an antibiotic exposure. Knowing this value enables newborn care teams to know how many newborns they are treating in relation to the number of newborns with proven infection. The NAE count is operationally defined as follows:

A newborn is considered to have experienced an antibiotic exposure if he/she received one or more doses of an antibacterial or antifungal agent administered intravenously or intramuscularly in any location in the hospital during the inpatient stay associated with maternal delivery. Thus, each newborn will be counted as either a "0" – if there were no such medication exposures, or a "1" – if there were any such medication exposures (number of doses/number of days does not matter).

Recommended Data Collection Process:

Hospitals that plan to run a database query of a their order entry system for the NAE data element, should note that the specifications for generating the NICU antibiotic use rate (AUR) numerator are closely related to the specifications for counting newborn antibiotic exposures.

- The modifications entail expanding the specification of hospital location to cover all newborns in the hospital, including those elsewhere than the NICU, and changing from seeking a count of the number of days treated with antibiotics to a categorical a "yes/no" "0/1" response depending on whether an antibiotic was received. The query would then compute the arithmetic sum of all "0" and "1" values.

- In circumstances where a staff member must review each newborn medical record to obtain the NAE count the following process flow should be helpful.

  **Step 1:**

  Generate a list of all inborn newborn admissions in your facility. This includes infants in mother/baby units and the NICU.

  **Step 2:**

  Review physician orders or medication administration record to determine if the newborn received an antibacterial or antifungal medication by the intravenous (IV) or intramuscular (IM) route of administration. You will want to obtain a list of the medications in these categories used for newborns by the physicians in your facility. Most commonly, they will include ampicillin and gentamicin, but expect to find other medications on your facility's list too.

  **Step 3:**

  If the newborn received no such medication, then assign a "0" as the count for that newborn. If the newborn received one or more doses of such medication – and the actual number of doses does not matter – then assign a "1" as the count for that newborn.

  **Step 4:**

  After all newborn medical records have been so reviewed, compute the arithmetic sum of all "0" and "1" values. That sum is the value for your hospital's NAE.

  **Step 5:**

  Enter that computed arithmetic sum as your hospital's NAE value.

**Note:**

The NAE count is a required variable for maintaining CCS approval. A missing response is considered an "**Incomplete Submission**." CCS will follow-up with your Center if this data is not provided.

Please contact Dr. Schulman, Director, NICU Quality Measurement and Improvement, California Department of Health Care Services, CCS if your NICU is challenged with this requirement.

## NICU Antibiotic Days

To assess antibiotic use, enter the number of days an infant in your NICU was exposed to treatment with antibiotics. For this item, antibiotics include antibacterial and antifungal agents, not however antiviral agents.

The antibiotic use rate is calculated as the ratio of the number of days an infant in your NICU was exposed to treatment with antibiotics (numerator) and the total number of patient days for all on-site licensed NICU beds entered in Section E (denominator).

A frequently asked question is "When looking at antibiotic use rate, do you want just the intial antibiotic therapy per patient or all treatment for the whole stay per patient?" *Answer:* The data entry field does provide the answer to the question: all treatment for the whole stay is that is asked for.

The stated difficulty to provide this data rests in how the data are collected. Our understanding is that all CCS NICUs are supported by a computerized pharmacy order entry system (CPOE). Each pharmacy department can write a query to the system that will provide the needed information. Once the query is written, it can be used reiteratively with no or little aditional work involved.

The pertinent computer application is "the computerized pharmacy order entry system", which is often implemented before a comprehensive electronic medical record (EMR) system is rolled out. We recommend that the NICU data team discuss this issue with their pharmacy department.

**Note:**

The antibiotic use is a required variable for maintaining CCS approval. A missing response is considered an "**Incomplete Submission**." CCS will follow-up with your Center if this data is not provided.

Please contact Dr. Schulman, Director, NICU Quality Measurement and Improvement, California Department of Health Care Services, CCS if your NICU is challenged with this requirement.

## Section F. Central line-Associated Bloodstream Infections (CLABSI) of Infants born in 2019 by Birth Weight

### CLABSI by Birth Weight

CCS and the Department of Health Care Services (DHCS) use the same central line-associated bloodstream infection (CLABSI) case definition as already used by all California hospitals in reporting these events to the California Department of Public Health via the Centers for Disease Control and Prevention/National Healthcare Safety Network (CDC/NHSN).

As for all infections reported to NHSN, infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection, are not considered healthcare associated. Therefore, infections that become apparent within the first few days of admission must be carefully reviewed to determine whether they should be considered healthcare associated.

Primary bloodstream infections (BSI) are laboratory-confirmed bloodstream infections (LCBI) that are not secondary to a community-acquired infection or an HAI meeting CDC/NHSN criteria at

another body site. Report BSIs that are central line associated (i.e., a central line or umbilical catheter was in place at the time of, or within 48 hours before, onset of the event).

**Note:**

There is no minimum period of time that the central line must be in place in order for the BSI to be considered central line associated.

Central line: An intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring. The following are considered great vessels for the purpose of reporting central line BSI and counting central line days in the NHSN system: Aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, femoral veins, and in neonates, the umbilical artery/vein.

**Note:**

1. Neither the insertion site nor the type of device may be used to determine if a line qualifies as a central line. The device must terminate in one of these vessels or in or near the heart to qualify as a central line.
2. An introducer is considered an intravascular catheter, and depending on the location of its tip, may be a central line.
3. A Hemodialysis Reliable Outflow dialysis catheter (HERO), that is located in one of the great vessels and used for purposes outlined above, is considered a central line.
4. Pacemaker wires and other nonlumened devices inserted into central blood vessels or the heart are not considered central lines, because fluids are not infused, pushed, nor withdrawn through such devices.
5. The following devices are not considered central lines: extracorporeal membrane oxygenation (ECMO), femoral arterial catheters and intraaortic balloon pump (IABP) devices. If you have a question about whether a device qualifies as a central line, please email us at NHSN@cdc.gov.

Infusion: The introduction of a solution through a blood vessel via a catheter lumen. This may include continuous infusions such as nutritional fluids or medications, or it may include intermittent infusions such as flushes or IV antimicrobial administration, or blood, in the case of transfusion or hemodialysis.

Umbilical catheter: A central vascular device inserted through the umbilical artery or vein in a neonate.

**Resources:**

CDPH - Central Line-associated Bloodstream Infection (CLABSI)

CDPH - CLABSI Report Page

Central Line-Associated Bloodstream Infection (CLABSI) Event (CDC)

http://www.cdc.gov/HAI/bsi/CLABSI-resources.html

CLABSI Patient Safety Form (CDC).

### Central Line Days by Birth Weight

For the CCS form, to monitor CLABSI in the NICU population, it is necessary to collect data for both umbilical catheters and for non-umbilical central lines.

For each day of the year, at the same time each day, record the number of patients in each birthweight category who have an umbilical catheter in place or who have 1 or more non-umbilical central line(s) in place.

**Note:**

Each patient day with a central line or umbilical catheter is counted as "1" central line day, regardless of how many central lines the patient has and regardless whether the patient has an umbilical catheter and central line(s) in place.

**Resources:**

Collection of CLABSI denominator data

Denominators for Neonatal Intensive Care Unit (NICU) (CDC 57.116) form

## NICU Quality Improvement Projects

This section was designed to fulfill several purposes:

- To support the California Children's Services' goal to monitor quality improvement efforts for all CCS-approved units.
- To fulfill the American Board of Pediatrics' requirement for Quality Improvement Competency Validation for Sub-specialty Recertification for neonatologists.
- To provide NICU Database Members with a convenient summary of perinatal improvement activities that would be useful to submit to the Joint Commission and other similar organizations.

List up to 10 active projects during the project year (1/1/ to 12/31/ ). List one project in each section. Use the buttons provided at the bottom of the form to add or remove projects.

**Project Title**

Enter a brief project title.

**Project Leader / Co-Leader**

The leader or co-leader must be a neonatologist who has attended a Quality Improvement Workshop.

**Project Leader E-Mail Address**

Enter the project leader's e-mail address.

**Specific Aim**

Describe the aim of the project. You must include pre-project rate or percentage, direction of change, goal rate or percentage, and projected time to accomplish the goal. Example: Increase full or partial breastmilk on discharge from 45 percent to 85 percent by . **Be careful when pasting from Word or similar word processors**. Doing so will frequently introduce characters that cannot be displayed as word processors assume special keyboard character sets.

**Progress**

For continuing projects from the previous year, please describe project progress.

**Target Population**

Specify the target population of your project.

**Project Start Date**

Use the date of the first serial meeting of the project planning group.

**Institute for Health Care Improvement (IHI) Level**

Enter the most recent level as of December 31, . You may assess your project based on preliminary NICU Database available in December of the report year with final updates if indicated when NICU Database for the report year closes. The table below is based on information from http://www.ihi.org/resources/Pages/Tools/AssessmentScaleforCollaboratives.aspx.

| Assessment/Description | Definition |
|---|---|
| 1.0 – Forming team | Team has been formed; target population identified; aim determined and baseline measurement begun. |
| 1.5 – Planning for the project has begun | Team is meeting, discussion is occurring. Plans for the project have been made. |
| 2.0 – Activity, but no changes | Team actively engaged in development, research, discussion but no changes have been tested. |
| 2.5 – Changes tested, but no improvement | Components of the model being tested but no improvement in measures. Data on key measures are reported. |
| 3.0 – Modest improvement | Initial test cycles have been completed and implementation begun for several components. Evidence of moderate improvement in process measures. |
| 3.5 – Improvement | Some improvement in outcome measures, process measures continuing to improve, PDSA test cycles on all components of the |

| | |
|---|---|
| | Change Package, changes implemented for many components of the Change Package. |
| 4.0 – Significant improvement | Most components of the Change Package are implemented for the population of focus. Evidence of sustained improvement in outcome measures, halfway toward accomplishing all of the goals. Plans for spread the improvement are in place. |
| 4.5 – Sustainable improvement | Sustained improvement in most outcomes measures, 75% of goals achieved, spread to a larger population has begun. |
| 5.0 – Outstanding sustainable results | All components of the Change Package implemented, all goals of the aim have been accomplished, outcome measures at national benchmark levels, and spread to another facility is underw |

**Project Progress**

Check whether the project is still in process or whether its goal has been achieved.Changed Items:List any of the item numbers 2 through 8 for this project that have changed since the last report.

# CCS Report

## Introduction

The annual NICU-CCS Report serves a dual purpose of fulfilling the CCS requirement to report on all NICU activity of CCS-accredited hospitals, as well as, efficiently utilizing the mortality and morbidity-specific outcomes based on the NICU Database. Prior to 2006, hospitals were required by CCS to report activity on all infants. Through NICU Database member NICUship, some of the data that was previously required of hospitals is now directly abstracted from the NICU Database, and then combined with data submitted by NICUs through the annual CCS Supplemental form.

This year's NICU-CCS final report format has been revised to facilitate presentation and interpretation. The report contains data from two sources, the CCS supplemental form, and the NICU Database.

The CCS supplemental form includes the number of live births at the reporting NICU's hospital (or, for satellite NICUs, the number of live births at the hospital location hosting the satellite NICU), NICU admissions, transport-in and transport-out activity, and mortality information that is based on all NICU admissions, provided that the infant was born during 2018 and was less than a year old at the time of admission. This information is used to propagate the all Births, NICU Admissions, and NICU Transport statistics for sections A, C, D and E of the CCS report. It is also used to propagate the all Admissions Mortality table for section B of the CCS report.

The CCS supplemental form is based on all NICU admissions in order to include infants who are not eligible and therefore excluded from the NICU Database. Infants not eligible for the NICU Database include:

1. any infant who is admitted or transported-in to the NICU after Day 28;
2. any infant whose birth weight is less than 401 grams and whose gestational age is outside of the 22 weeks 0 days and 31 weeks 6 days (inclusive) range;
3. any infant weighing more than 1,500 grams who does not have evidence of significant illness (severe acuity) such as death, acute transport-in or transport-out, major surgery, prolonged ventilation, hyperbilirubinemia, exchange transfusion, and/or perinatal asphyxia;
4. any infant weighing more than 1,500 grams that is transported for convalescent care.

The NICU Database is used to generate birth weight specific mortality and morbidity data and is based on a subset of a NICU's admissions. This data is used to generate sections F through L of the CCS Report. To be included in the NICU Database an infant must be admitted to the NICU prior to 28 days of life. In addition, if the infant is over 1,500 grams there must be evidence of significant illness such as death, acute transport-in or transport-out, major surgery, prolonged ventilation, etc. These restrictions are in order to be able to compare the reporting NICU's outcomes with those reported in similar national databases. Information from the NICU Database is used to propagate the NICU Database mortality and the NICU Database birth weight specific morbidity sections found in the report.

In summary, the CCS supplemental information is used to provide a synopsis of the overall activity in a NICU based on all infants admitted to the NICU within the first year of life. The NICU Database is used to provide birth weight specific mortality and morbidity information that can be compared across California NICUs based on the subset of 401 to 1,500 grams or 22 to 31 6/7 weeks gestation and > 1,500 gram high acuity infants admitted in the first 28 days of life.

## Section A. Hospital Births and NICU Admissions by Birth Weight

All quantities described below are displayed by birth weight group for .

**Total Live Births in Your Center**
Includes **all** live births of babies born anywhere in your hospital.

**Total Admissions to Your NICU**
Includes **all** inborn and outborn infants admitted to your NICU. Starting from 2013, the definition of inborn/outborn admission is aligned with the definition that the NICU Database uses.

**Inborn Admissions to Your NICU**
Includes **all** infants who were admitted to your NICU after birth without being previously discharged home or transported out.

**Inborn Admission Percentage for Your NICU**
Ratio of the total number of inborn admissions and number of live births in your hospital.

**Outborn Admissions to Your NICU**
Includes 1) transports into your NICU of an inpatient from another facility (inborn or outborn); or 2) admissions to your NICU of any outborn infant regardless of location, e.g., home, another area in you hospital, ER, doctor's office. Note that starting from 2013, outborn admissions are aligned with the definition the NICU Database uses. Specifically, multiple re-admissions from hospital locations of the same infant are not counted as separate admissions. The first inborn/outborn admission is counted until an infant goes home. Each time an infant is re-admitted from home, this infant contributes to the outborn admission count.

**Acute Outborn Admissions to Your NICU**
An Acute Outborn Admission is defined as the admission of an infant with medical problems that require urgent care. If the infant is an acute transport-in, then the care that is medical, diagnostic, or surgical therapy is not provided, or cannot be provided due to temporary staffing / census issues, or insurance restrictions at the referring hospital. Note that starting from 2013, after the first admission after birth, re-admissions to your NICU are only counted if the infant is re-admitted from a non-hospital location.

**Non-Acute Outborn Admissions to Your NICU**
A Non-Acute Outborn Admission is an admission for growth care, discharge planning care, chronic care, convalescent care, and/or hospice care. If an infant is a non-acute transport-in, then the infant's initial medical, diagnostic, and surgical needs have been met, and the infant's condition has been stabilized. The medical needs of non-acute transports-in may range from extensive and extremely complex care to minimal care for feeding and growth. Note that starting from 2013, after the first admission after birth, re-admissions to your NICU are only counted if the infant is re-admitted from a non-hospital location.

## Section A. Co-Located Hospital Births and NICU Admissions by Birth Weight

All quantities described below are displayed by birth weight group for .

**Total Live Births at Co-Located Hospital**
Includes **all** live births of babies born anywhere in the co-located hospital.

**Total Admissions to Your NICU**
Includes **all** infants born at the co-located hospital and outborn infants admitted to your NICU.

**Admissions to Your NICU of Infants born at Co-Located Hospital**
Includes **all** infants who were admitted to your NICU after birth at the co-located hospital without being previously discharged home or transported out.

**% of Live Births at Co-Located Hospital Admitted to Your NICU**
Ratio of the total number of infants born at co-located hospital and admitted to your NICU relative to the number of all live births at the co-located hospital.

**Outborn Admissions to Your NICU**
Includes 1) transports into your NICU of an inpatient from another facility (inborn or outborn); or 2) admissions to your NICU of any outborn infant regardless of location, e.g., home, another area in you hospital, ER, doctor's office. Note that starting from 2013, outborn admissions are aligned with the definition the NICU Database uses. Specifically, multiple re-admissions from hospital locations of the same infant are not counted as separate admissions. The first inborn/outborn admission is counted until an infant goes home. Each time an infant is re-admitted from home, this infant contributes to the outborn admission count.

**Acute Outborn Admissions to Your NICU**
An Acute Outborn Admission is defined as the admission of an infant with medical problems that require urgent care. If the infant is an acute transport-in, then the care that is medical, diagnostic, or surgical therapy is not provided, or cannot be provided due to temporary staffing / census issues, or insurance restrictions at the referring hospital. Note that starting from 2013, after the first admission after birth, re-admissions to your NICU are only counted if the infant is re-admitted from a non-hospital location.

**Non-Acute Outborn Admissions to Your NICU**
A Non-Acute Outborn Admission is an admission for growth care, discharge planning care, chronic care, convalescent care, and/or hospice care. If an infant is a non-acute transport-in, then the infant's initial medical, diagnostic, and surgical needs have been met, and the infant's condition has been stabilized. The medical needs of non-acute transports-in may range from extensive and extremely complex care to minimal care for feeding and growth. Note that starting from 2013, after the first admission after birth, re-admissions to your NICU are only counted if the infant is re-admitted from a non-hospital location.

## Section B. NICU Deaths by Birth Weight

All quantities described below are displayed by birth weight group for .

**In-Hospital Infant Mortality Rate per 1,000 NICU Admissions**
Calculated as the ratio of the sum of neonatal (within 28 days of birth counting the day of birth as day 1) and post-neonatal deaths (deaths after age 28 days) to infants while in your NICU or under the care of your NICU staff regardless of the location in your hospital divided by the total number of NICU admissions and multiplied by 1,000.

**Total Number of Deaths of Infants Admitted to your NICU**
Number of deaths of infants admitted to your NICU or under the care of your NICU staff regardless of the location in your hospital.

**Total Number of Deaths Prior to and Including Day 28**
Number of deaths of infants admitted to your NICU or under the care of your NICU staff regardless of the location in your hospital that occurred prior to or on the day on which the infant was 28 days counting the day of birth as day 1 (neonatal deaths).

**Total Number of Deaths After Day 28**
Number of deaths of infants admitted to your NICU or under the care of your NICU staff regardless of the location in your hospital that occurred after the day on which the infant was 28 days (postneonatal deaths).

**Delivery Room Deaths**
Number of deaths that occurred in your Delivery Room or initial resuscitation area within 12 hours of birth and prior to NICU admission.

## Section C. NICU Transports Out by Birth Weight

All quantities described below are displayed by birth weight group for .

**Total Number of Infants Transported Out**
Number of infants transported out of your NICU to another facility or another unit in your hospital. The total number of infants transported out is the sum of acute and non-acute transports out.

**Acute Transports-Out**
The number of infants with medical problems that require acute resolution for survival who are transported out in order to obtain medical, diagnostic, or surgical therapy that is not provided, or that cannot be provided due to temporary staffing / census issues, or insurance restrictions at your hospital. A transport is considered acute if the primary reason for the transport was NOT feeding / growing or convalescent reasons. Acute transports occur to get resources that are not available at your hospital. Starting from 2013, if an infant was transported out multiple times without ever going home, this infant is only included once.

**Non-Acute Transports Out**
The number of infants whose initial medical / surgical needs have been met; whose condition has been stabilized; and who are transported-out in order to obtain growth care, discharge planning care, chronic care, or hospice care. The medical needs of non-acute transports may range from extensive and extremely complex care to minimal care for feeding and growth. Starting from 2013, if an infant was transported out multiple times without ever going home, this infant is only included once.

## Section D. Hospital Births and Inborn NICU Admissions by Gestational Age

All quantities described below are displayed by gestational age group for .

**Total Live Births in Your Center**
Includes all live births anywhere in your hospital.

**Inborn Admissions to Your NICU**
Includes all infants who were admitted to your NICU after birth without being previously discharged home or transported out.

**Inborn Admission Percentage for Your NICU**
Ratio of the total number of inborn admissions and number of live births in your hospital.

## Section D. Co-Located Hospital Births and NICU Admissions by Gestational Age

All quantities described below are displayed by gestational age group for .

**Total Live Births at Co-Located Hospital**
Includes **all** live births at the co-located hospital born anywhere in the co-located hospital.

**Admissions to Your NICU of Infants Born at Co-Located Hospital**
Includes **all** infants who were born at the co-located hospital and who were admitted to your NICU after birth without being previously discharged home or transported out.

**% of Live Births at Co-Located Hospital Admitted to your NICU**
Ratio of the total number of admissions from co-located hospital to your NICU relative to the total number of live births at the co-located hospital.

## Section E. Inborn Admission Percentage

The inborn admission percentage is defined as the ratio of total number of infants admitted to your NICU after birth without ever going home and the total number of births in your hospital.

Section E shows 2 charts. The first chart shows **your NICU's** inborn admission percentage relative to the inborn admission percentage of all NICU Database member NICUs with live births at the NICU's location. If your NICU is a regional NICU, the second chart shows **your NICU's** inborn admission percentage relative to the inborn admission percentage of all regional NICU Database member NICUs with live births at the NICU's location. If your NICU is a Community, Intermediate or non-CCS NICU, the second chart shows **your NICU's** inborn admission percentage relative to the inborn admission percentage of all non-regional NICU Database member NICUs with live births at the NICU's location.

The distribution of the inborn admission percentage across the comparison group is displayed as a horizontal box plot. The box plot displays the lower and upper quartile of the inborn admission percentage for the comparison group as the left and right boundary of the blue box. This means that

25% of comparison group NICUs have an inborn admission percentage that is lower than the lower quartile (left box boundary), and 25% of comparison group NICUs have an inborn admission percentage that is higher than the upper quartile (right box boundary. The median inborn admission percentage across comparison group NICUs is displayed as a vertical bar. The box plot also shows the minimum and maximum observed inborn admission percentage across the comparison group that is within the lower and upper inner fence defined as at 1.5 times the Interquartile Range (IQR=Q3-Q1), i.e., the minimum value at or above Q1 - 1.5 * IQR and the maximum value at or below Q3 + 1.5 * IQR. Note that the inner fence is not displayed in the chart. Your NICU's inborn admission percentage is marked by a red star.

If your NICU is not located at a hospital with live births, section E does not apply, and no chart is shown.

## Section E. Co-Located Hospital / Inborn Admission Percentage

For satellite NICUs, the Co-Located Hospital / inborn admission percentage is defined as the ratio of the total number of infants born at the co-located hospital and admitted to your NICU after birth without ever going home relative to the total number of births at the co-located hospital. As the NICU Database includes a small number of satellite NICUs, the comparison group for this section is expanded to include inborn admissions at all NICU Database member NICUs.

Section E shows 2 charts. The first chart shows **your NICU's** co-located hospital admission percentage relative to the co-located hospital / inborn admission percentage of all NICU Database member NICUs with live births at the NICU's location. The second chart shows **your NICU's** co-located admission percentage relative to the co-located / inborn admission percentage of all non-regional NICU Database member NICUs with live births at the NICU's location.

The distribution of the co-located hospital / inborn admission percentage across the comparison group is displayed as a horizontal box plot. The box plot displays the lower and upper quartile of the co-located hospital / inborn admission percentage across the comparison group as the left and right boundary of the blue box. This means that 25% of comparison group NICUs have a co-located hospital / inborn admission percentage that is lower than the lower quartile (left box boundary), and 25% of comparison group NICUs have a co-located hospital / inborn admission percentage that is higher than the upper quartile (right box boundary. The median percentage across comparison group NICUs is displayed as a vertical bar. The box plot also shows the minimum and maximum observed co-located hospital admission percentage across the comparison group that is within the lower and upper inner fence defined as at 1.5 times the Interquartile Range (IQR=Q3-Q1), i.e., the minimum value at or above Q1 - 1.5 * IQR and the maximum value at or below Q3 + 1.5 * IQR. Note that the inner fence is not displayed in the chart. Your NICU's co-located hospital admission percentage is marked by a red star.

## Section F. Data Quality Assessment

This section shows some metrics assessing the quality of data submitted by the reporting NICU. All data are shown for inborn infants, outborn infants, and both groups of infants combined.

**% Records with Confirmed Unknown Risk Factors including race/ethnicity**
The percent of **all** records submitted to the NICU Database for which one of the following variables is missing: birth weight, gestational age (weeks and/or days), prenatal care, gender, congenital anomaly, multiple gestation, 5-minute Apgar, maternal age, race, or ethnicity. These risk factors are used in many of the NICU Database risk-adjustment models that allow the generation of risk-adjusted rates. If any of the risk factors needed for appropriate risk adjustment is unknown, the record has to be excluded from the risk-adjustment calculations and might lead to the inability to generate any risk-adjusted rates for the reporting NICU altogether. As race/ethnicity is reported as Confirmed Unknown for a large number of records, the NICU Database uses an algorithm that will impute the "average" race for these records.

**% Records with Confirmed Unknown Risk Factors excluding race/ethnicity**
The percent of **all** records submitted to the NICU Database for which one of the following variables is missing: birth weight, gestational age (weeks and/or days), prenatal care, gender, congenital anomaly, multiple gestation, 5-minute Apgar, or maternal age.

**% Records with Confirmed Unknown Process/Outcomes Measures**
The percent of **all** records submitted to the NICU Database for which one of the following variables is missing: initial disposition, any post-transport disposition, enteral feeding at discharge, oxygen at discharge, initial length of stay, total length of stay for transported infants, respiratory support at 36 weeks adjusted gestational age, oxygen at 28 days, nitric oxide, antenatal steroids, documentation of reason for no antenatal steroids when antenatal steroids not given, postnatal steroids, postnatal steroids for chronic lung disease, PVL image, PVL, PDA, NEC, Ibuprofen, Indomethacin, PDA ligation, NEC surgery, ROP eye exam, ROP grade, ROP surgery, Other Surgery, temperature at NICU admission, early bacterial infection, late bacterial infection, cNegStaph infection, fungal infection, cranial image, grade of hemorrhage, pneumothorax, cooling status, cooling method, or HIE.

**Mean # of Confirmed Unknown Items in DRD & A/D NICU Database Forms**
Shown is the mean number of items that is reported as confirmed unknown on either the Delivery Room Death or Admission/Discharge form.

**Mean # of Confirmed Unknown Items in CPeTS Form**
Shown is the mean number of items that is reported as confirmed unknown on the CPeTS form. Note that this quantity is not applicable for inborn infants.

## Section G. NICU Activity and Outcomes Overview

All high-level summary statistics are displayed for .

**Average Daily Census**
The occupancy of **all** on-site, licensed NICU beds defined as the total number of patient days in 2018 divided by the number of days in 2018 (365). The average daily census does not include other hospitals or satellite facilities in the same system.

**Total Number of Surgeries**
The total number of surgeries reported in the NICU Database that was performed at your facility. Circumcision is not included in the total number of surgeries. ECMO, ECMO cannulation, ECMO decannulation, peritoneal dialysis, placement or removal of peritoneal dialysis catheters, chest tube

placement, or central line placement are not considered surgeries and not included in the total number of surgeries. For a complete list of **all** surgeries included, please review the surgeries coded in the NICU Database.

**Number of Inborn Infants > 1,500 grams admitted to NICU**
Displays the total number of infants weighing more than 1,500 grams that were born at your facility and then admitted to your NICU without a prior discharge.

**Number of Severe Acuity (NICU Database) Inborn Infants > 1,500 grams Admitted to NICU**
The number of infants weighing more than 1,500 grams that were born at your facility and were admitted to your NICU and for whom a NICU record was submitted. A NICU record is submitted for **all** infants > 1,500 grams who are admitted to your NICU within 28 days of birth and who experienced one of the following events: infant death, surgery, ventilation > 4 hours, acute transport-in, acute transport-out, early bacterial sepsis, or re-admission for hyperbilirubinemia.

**Average LOS for Infants 401 to 1,500 grams or 22 to 29 Weeks Gestation Admitted on or before DOL 28 and Discharged Home**
The average length of stay (in days) for inborn or outborn infants 401 to 1,500 grams or 22 to 29 completed weeks of gestation at birth who were admitted to your NICU on or before DOL 28 days and discharged home from your NICU.

**Observed to Expected Ratio with 95% Confidence Limits**
The ratio of your average LOS described above to a statistically expected LOS based on the entire population of NICU infants and upon risk factors in your patients. A ratio lower than 1 means that your infants were discharged home sooner than predicted by the statistical model. A ratio higher than 1 means that your infants were discharged home later than predicted by the statistical model. The two numbers shown in parentheses are the 95% confidence limits for the O/E ratio. A lower confidence limit exceeding 1 indicates that the length of stay in your center was statistically significantly longer than expected; an upper confidence limit less than 1 indicates that the length of stay in your center was statistically significantly shorter than expected. The statistical model uses multivariable logistic regression and takes into account your facility's mix of infant race, sex, gestational age, severity of congenital malformation, birth weight, 5-minute Apgar score, location of birth (inborn/outborn), multiple gestation, and whether or not the mother received prenatal care.

**In-Hospital Mortality per 100 Infants 401 to 1,500 grams or 22 to 29 weeks Gestation Admitted on or before DOL 28**
The in-hospital death percentage for inborn or outborn infants 401 to 1,500 grams or 22 to 29 completed weeks of gestation at birth who were admitted to your NICU on or prior to DOL 28 days and expired in your NICU.

**Observed to expected ratio with 95% confidence limits**
The ratio of your in-hospital mortality percentage described above to a statistically expected rate based on the entire population of NICU infants and upon risk factors in your patients. A ratio lower than 1 means that mortality at your NICU was lower than predicted by the statistical model. A ratio higher than 1 means that mortality at your NICU was higher than predicted by the statistical model. The two numbers shown in parentheses are the 95% confidence limits for the O/E ratio. A lower confidence limit exceeding 1 indicates that the mortality in your center was statistically significantly higher than expected; an upper confidence limit less than 1 indicates that the mortality in your center was statistically significantly lower than expected. The statistical model uses multivariable logistic

regression and takes into account your facility's mix of infant race, sex, gestational age, severity of congenital malformation, birth weight, 5-minute Apgar score, location of birth (inborn/outborn), multiple gestation, and whether or not the mother received prenatal care.

## Section H. NICU-CCS Linked HRIF Referral Summary for Infants Discharged Home

The California Children's Services (CCS) High Risk Infant Follow-Up (HRIF) program was established to follow infants considered at increased risk for neurodevelopmental-related CCS-eligible conditions after discharge from a CCS-approved NICU. CCS Program standards require that each CCS-approved NICU ensure the follow-up of such discharged high risk infants and that each NICU shall either have an organized program or a written agreement for provision of these services by another CCS-approved NICU.

Section H summarizes for several infant subgroups the number and percentage of NICU infants who were registered with HRIF. HRIF uses a web-based reporting system to allow CCS NICUs to enroll infants in the HRIF program. The HRIF reporting program operates independently of the NICU Database. Therefore, in order to generate the data for section H, it was necessary to link the independent HRIF and NICU Databases.

At the time of registration, besides other variables, the HRIF program collects data on birth date, gestational age in days, maternal date of birth, infant sex, birth order, number of multiples, birth location, registering NICU and NICU infant ID at the registering NICU. Reporting on these variables is not complete for all infants. Therefore, we devised a 2-step process that matches an HRIF infant with its NICU record:

1. In the first step, the NICU ID number and registering NICU's OSHPD ID number is used to find an HRIF infant in the NICU Database. Based on the other data in the infant's HRIF and NICU record, an agreement statistic is calculated that reflects how well the information submitted to HRIF and to the NICU Database agrees. Only if the information submitted shows a satisfactory level of agreement, the HRIF and NICU records are considered a match.

2. In the second step, the birth dates submitted to HRIF and the NICU Database are used to generate a possible set of NICU Database matches for each HRIF infant. For each possible record pair, an agreement statistic is calculated that reflects how well the information submitted to HRIF and to the NICU Database agrees. The matched record pair with the highest agreement statistic is retained, and only if the agreement statistic for this matched record pair exceeds a minimum threshold, the match is retained.

This description implies that if an infant's NICU ID number and birth date are both mis-coded in either data source, infants cannot be matched. In our tests, we found that this 2-step process worked very well in identifying matches even in the presence of coding errors.

The table displayed in Section H shows the total number of NICU infants and the number and percent of NICU infants referred to HRIF for 5 HRIF eligibility criteria:

- Very Low Birth Weight (≤ 1,500 grams birth weight);

- Extremely Low Birth Weight (< 1,000 grams birth weight);
- Gestational Age < 28 weeks;
- Gestational Age 28 to 31 weeks;
- Infants with Moderate/Severe HIE or Active Cooling;
- Infants with ECMO;
- Infants with Seizures;
- Infants with Congenital Heart Disease;
- Infants with Nitric Oxide for > 4 hours.

Note that only infants who were discharged home from your NICU are included in the HRIF referral report.

The matching of HRIF and NICU Database is performed once daily.

## Section I. Growth Trajectories for Infants 22 to 29 Weeks Admitted to NICU

Section I was added to the CCS report for the first time in 2012.

Section I overlays the weight growth trajectories, that are observed for your NICU's infants born at 22 to 29 weeks gestation, on the 10th, 50th (median) and 90th percentile of the Fenton Weight Growth Curve (Fenton TR. A new growth chart for preterm babies: Babson and Benda's chart updated with recent data and a new format. BMC Pediatrics 2003, 3:13).

The 10th and 90th percentile of the Fenton growth chart is shown as a blue band. The median is shown as a black solid line.

The top chart is based on all infants who were initially discharged home from your NICU. If no infants were initially discharged home from your NICU, no chart is produced. The bottom chart is based on all infants who were initially transported out of your NICU. If no infants were initially transported out of your NICU, no chart is produced.

Each chart shows gestational age (GA) in completed weeks / post-menstrual age (PMA) in completed weeks on the horizontal axis. Post-menstrual age is calculated as:

(Weeks Gestation in Days + (Age in Days at Admission - 1) + (Initial Length of Stay - 1)) / 7

which is rounded down to completed weeks.

Two lines are shown. The blue line shows for each completed week gestation the median birth weight observed for your NICU. The blue number near the horizontal axis shows the number of infants born at that GA. The green line shows for each post-menstrual age week the median discharge weight observed for your NICU. The green number near the horizontal axis shows the number of infants initially discharged at that PMA.

For the top chart usually the blue and green line do not overlap. If they do, please check your NICU Database. For the bottom chart, it is possible for the blue and green line to overlap. In this case the number of infants at each GA / PMA is separated by a black vertical slash (/).

## Section J. Percent of Eligible Infants Receiving Interventions Associated with Improved (ANS, Cranial Imaging, ROP Exam, Breast Milk) or with Compromised (Postnatal Steroids) Outcomes

This graph shows the percentage of your facility's infants who received the listed interventions / experienced the listed outcome.

The distribution of the percentage across the NICU Database member NICUs is displayed as a horizontal box plot for each outcome. The box plot displays the lower and upper quartile of the percentage across the NICU Database member NICUs as the left and right boundary of the blue box. This means that 25% of member NICUs have a percentage that is lower than the lower quartile (left box boundary), and 25% of member NICUs have a percentage that is higher than the upper quartile (right box boundary). The median percentage across member NICUs is displayed as a vertical bar. The box plot also shows the minimum and maximum outcome percentage across the comparison group that is within the lower and upper inner fence defined as at 1.5 times the Interquartile Range (IQR=Q3-Q1), i.e., the minimum value at or above Q1 - 1.5 * IQR and the maximum value at or below Q3 + 1.5 * IQR. Note that the inner fence is not displayed in the chart.

The red star represents the percentage of infants receiving the listed intervention / experienced the listed outcome at your center.

The calculation of each measure is based on the appropriate subset of eligible infants as explained below:

**Antenatal Steroids**
The antenatal steroid process measure has been revised in 2013 to largely follow The Joint Commission (THC) recommendation. Only those infants are included who were born at your center and who were 24 to 31 completed weeks of gestation at birth. Infants with unknown antenatal steroid usage are assumed to not have received antenatal steroids. Per JCAHO recommendation, infants who were born to a mother who did not receive antenatal steroids due to a documented reason are not included in the calculations.

**Cranial Imaging Prior to Day 28**
The process measure cranial imaging prior to day 28 is based on infants 401 to 1,500 grams or 22 to 29 weeks of gestation. Infants for whom cranial imaging prior to day 28 is reported as unknown are assumed to not have had cranial imaging.

**ROP Eye Exam Prior Discharge**
The process measure ROP eye exam prior discharge is based on infants who received an eye exam at the appropriate post-menstrual age as determined by gestational age at birth, age in days at admission to, length of stay at, and discharge status from your facility. For infants with unknown eye exam status, it is assumed that the infant did not receive an eye exam.

**Home Discharge on at least Some Breast Milk**
The process measure home discharge on at least some breast milk is based on infants 401 to 1,500

grams or 22 to 29 weeks of gestation who were discharged home from your center. For infants with unknown breast milk use, it is assumed that the infant did not receive breast milk.

**Postnatal Steroids for CLD**
The postnatal steroids for CLD measure is based on a) infants with evidence of CLD; and b) infants who received postnatal steroids for CLD at yourcenter. For the purpose of this report, an infant is considered as having CLD if i) the infant is hospitalized and on oxygen at 36 weeks adjusted gestational age; ii) the infant is discharged home on oxygen at 34 or 35 weeks adjusted gestational age; iii) the infant is transported out on oxygen at 34 or 35 weeks adjusted gestational age and not transported back to your center. Infants who were discharged prior to 34 weeks adjusted gestational age are included in the denominator if they were not discharged on oxygen; however infants who were discharged prior to 34 weeks adjusted gestational age and on oxygen at the time of discharge are not included in any calculations since their CLD status is unknown. All other infants who were not hospitalized at 36 weeks adjusted gestational age are not included in the CLD percentage.

## Section K. Percent of Infants 401 to 1,500 grams or 22 to 29 Weeks Gestation with Selected Morbidities

Section H shows the observed percentage of your facility's infants who were 401 to 1,500 grams or 22 to 29 weeks gestation at birth with selected morbidities. Note that the numbers shown in Section H are not adjusted for your center's case mix. Section I displays risk-adjusted numbers.

The distribution of the outcome percentage across the NICU Database member NICUs is displayed as a horizontal box plot for each outcome. The box plot displays the lower and upper quartile of the outcome percentage across the NICU Database member NICUs as the left and right boundary of the blue box. This means that 25% of NICU Database member NICUs have an outcome percentage that is lower than the lower quartile (left box boundary), and 25% of NICU Database member NICUs have an outcome percentage that is higher than the upper quartile (right box boundary). The median percentage across NICU Database member NICUs is displayed as a vertical bar. The box plot also shows the minimum and maximum observed percentage across the comparison group that is within the lower and upper inner fence defined as at 1.5 times the Interquartile Range (IQR=Q3-Q1), i.e., the minimum value at or above Q1 - 1.5 * IQR and the maximum value at or below Q3 + 1.5 * IQR. Note that the inner fence is not displayed in the chart.

The red star represents the outcome percentage for the reporting center.

For **all** morbidities shown in Section H, only observations with non-missing observations for the listed outcome are included. For instance, if it is not known whether or not an infant has NEC, this infant is not included in the percentage calculations for NEC.

**Pneumothorax @**
The percent of infants with pneumothorax only includes those infants with evidence of pneumothorax at your facility.

**Chronic Lung Disease (CLD)**
For the purpose of this report, an infant is considered as having CLD if i) the infant is hospitalized and on oxygen at 36 weeks adjusted gestational age; ii) the infant is discharged home on oxygen at 34 or 35 weeks adjusted gestational age; iii) the infant is transported out on oxygen at 34 or 35 weeks

adjusted gestational age and not transported back to your center. Infants who were discharged prior to 34 weeks of adjusted gestational age and not on oxygen at discharge are included in the denominator as they are assumed to not have had CLD; however infants who were discharged prior to 34 weeks adjusted gestational age and on oxygen at the time of discharge are not included in any calculations since their CLD status is unknown. All other infants who were not hospitalized at 36 weeks adjusted gestational age are not included in the CLD percentage.

**Discharged Home on Oxygen**
The percent of infants who are discharged home on oxygen only includes infants with known oxygen at discharge status who went home from yourcenter (possibly after being transported out from and transported back to your center).

**Nosocomial Infection @**
The percent of infants with a nosocomial infection is based on infants with a late bacterial, CNegStaph, or fungal infection that was first diagnosed at your facility. This measure includes infants who were in your hospital on or after day 3 of birth; infants who were never in your center on or after day 3 are excluded.

**CNegStaph Infection @**
The percent of infants with a cNegStaph infection is based on infants who were first diagnosed with CNegStaph at your center. Only infants who were hospitalized in your facility on or after day 3 are included.

**Fungal Infection @**
The percent of infants with a fungal infection is based on infants who were first diagnosed with a fungal infection at your center. Only infants who were hospitalized in your facility on or after day 3 are included.

**Any Peri-Intraventricular Hemorrhage (Peri-IVH)**
The any peri-IVH morbidity outcome is the percentage of infants with any grade of peri-intraventricular hemorrhage relative to all infants with a cranial exam within 28 days of birth.

**Severe Peri-IVH**
The severe peri-IVH morbidity outcome is the percentage of infants with grades 3 and 4 of peri-intraventricular hemorrhage relative to all infants with a cranial exam within 28 days of birth.

**Shunt Placed for Bleed**
The percent of infants which had a shunt placed to address peri-IVH is the number of infants who had a shunt placed for bleeding relative to all infants with a cranial image within 28 days of birth.

**Periventricular Leukomalacia (PVL)**
The PVL morbidity outcome is based on infants diagnosed with PVL relative to all infants who ever had a cranial image done.

**Any Retinopathy of Prematurity (ROP)**
The any ROP morbidity outcome is the percentage of infants with evidence of retinopathy of prematurity stages 1 through 5 relative to all infants who had an eye exam.

**Severe ROP or ROP Surgery**
The Severe ROP morbidity outcome is the percentage of infants with evidence of stage 3 through 5 ROP or who experienced ROP surgery relative to all infants with an eye exam.

**Necrotizing Enterocolitis (NEC) @**
The NEC morbidity outcome is the ratio of infants diagnosed with NEC at your facility relative to all infants admitted to your NICU.

**NEC surgery @**
The percent of infants with NEC surgery is calculated as the number of infants with NEC surgery at your facility relative to all infants with evidence of NEC.

**Cold-Stressed**
An infant is considered cold-stressed if its first temperature within 1 hour of NICU admission ranges from 36 to 36.4°C. The cold-stressed percentage is obtained as the ratio of cold-stressed infants relative to all infants admitted to your NICU with a known first temperature at NICU admission who were not cooled.

**Hypothermic**
An infant is considered hypothermic if its first temperature within 1 hour of NICU admission is under 36°C. The hypothermic percentage is obtained as the ratio of hypothermic infants relative to all infants admitted to your NICU with a known first temperature at NICU admission who were not cooled. Infants who were born in a non-hospital setting and admitted on the day of birth are excluded.

## Section L. Observed to Expected Ratios for Major Morbidities of Infants 401 to 1,500 Grams or 22 to 29 Weeks Gestation

For Section I the measures shown in Section H are risk-adjusted using multivariable logistic regression. Risk-adjustment models were developed for each outcome shown in this section based on 2015 to 2017 closed-out data for all NICU Database member NICUs. The red star shows your facility's observed to expected ratio for each morbidity measure. The observed to expected ratio compares the observed number of events to those expected based on the entire population of NICU infants and upon the specific risk factors in your patients. A ratio lower than 1 means fewer of your infants had the condition than predicted by the statistical model. A ratio higher than 1 means more of your infants had the condition than predicted by the statistical model.

The blue line shows the 95% confidence limits of the O/E ratio: A lower confidence limit exceeding 1 indicates that the morbidity experience in your center was statistically significantly higher than expected; an upper confidence limit less than 1 indicates that the morbidity experience in your center was statistically significantly lower than expected.

The risk-adjustment is based on multivariable logistic regression taking into account your facility's case mix of infant race, sex, gestational age, severity of congenital malformation, birth weight, 5-minute Apgar score, location of birth (inborn/outborn), multiple gestation, and whether or not the mother received any prenatal care.

For the specific definition of each measure displayed in Section I please consult the narrative for Section H.

**Only if more than 2 expected events occur in the reporting NICU, O/E ratios are provided. Otherwise the chart displays Cannot be produced.**

## Section M. Central Line Associated Blood Stream Infections (CLABSI)

### CLABSI Rate by Birth Weight

This section shows for the reporting NICU the number of CLABSI, the number of CL days and the implied CLABSI rate as the number of CLABSI per 1000 CL days per year stratified by birth weight. The number of CL days is based on the number of days that patients in each birth weight category had any central line(s) (umbilical catheter and/or 1 or more non-umbilical) in place.

### Comparison of CLABSI Rate by Birth Weight

For each birth weight group, the chart shows a box plot reporting CLABSI rates at the reporting NICU in the context of rates observed across the NICU Database member NICUs (top panel) and across a comparison group of NICUs of the same CCS level. The box plot displays the lower and upper quartile of the CLABSI rate across the reference group as the left and right boundary of the blue box. This means that 25% of NICU Database member NICUs have a CLABSI rate that is lower than the lower quartile (left box boundary), and 25% of NICU Database member NICUs have a CLABSI rate that is higher than the upper quartile (right box boundary). The median across NICU Database member NICUs is displayed as a vertical bar. The box plot also shows the minimum and maximum CLABSI rates across the comparison group that is within the lower and upper inner fence defined as at 1.5 times the Interquartile Range (IQR=Q3-Q1), i.e., the minimum value at or above Q1 - 1.5 * IQR and the maximum value at or below Q3 + 1.5 * IQR. Note that the inner fence is not displayed in the chart. The red star represents the CLABSI incidence at the reporting NICU.

Note:

This section was revised on 05/30/2014 to include a table and a chart. Due to the rare incidence of CLABSIs, the chart does not show always show a "box." As the box is defined by the lower and upper quartile of the CLABSI rate across the comparison group, if the lower and upper quartiles are both zero, the box cannot be seen. The table shows for the same comparison groups as the chart, the group's CLABSI rate and the median, lower quartile, upper quartile and upper decile as observed across the comparison group.

## Section N. NICU Antibiotic Use and Newborn Antibiotic Exposures

### Antibiotic Usage

This section uses a box plot to report antibiotic usage at the reporting NICU in the context of the range of a) antibiotic use within the NICU Database member NICUs and b) antibiotic use at a subset of NICU Database member NICUs based on CCS level. Antibiotic use is reported as the ratio of total number of days infants were exposed to at least 1 antibiotic (antibacterial or antifungal agents administered IV or IM) to the total number of patient days in the reporting NICU. The box plot displays the lower and upper quartile of the antibiotic use across the reference range as the left and right boundary of the blue box. This means that 25% of the comparison group's NICUs have a value that is lower than the lower quartile (left box boundary), and 25% of the comparison group's NICUs have a value that is higher than the upper quartile (right box boundary). The median

antibiotic use value across the reference range of NICUs is displayed as a vertical bar. The box plot also shows the minimum and maximum antibiotic use across the comparison group that is within the lower and upper inner fence defined as 1.5 times the Interquartile Range (IQR=Q3-Q1), i.e., the minimum value at or above Q1 - 1.5 * IQR and the maximum value at or below Q3 + 1.5 * IQR. Note that the inner fence is not displayed in the chart. The reporting NICU's antibiotic use is shown as a red star.

**Note that - as a balancing measure - data forwarded to CCS includes the incidence per 1,000 live births of early bacterial sepsis by pathogen.**

### Newborn Antibiotic Exposure Percent

This section reports on newborn antibiotic exposure as the percent of all newborn antibiotic exposures at the NICU hospital (or co-located hospital for satellite NICUs) among all liveborn and inborn newborns. For the purpose of this percentage, delivery room deaths (DRDs) are not included in the denominator. A newborn is considered to have experienced an antibiotic exposure if he/she received one or more doses of an antibacterial or antifungal agent administered intravenously or intramuscularly in any location in the hospital (or co-located hospital for satellite NICUs) or your NICU during the inpatient stay associated with maternal delivery. Thus, each newborn will be counted as either a "0" - if there were no such medication exposures, or a "1" - if there were any such medication exposures (number of doses/number of days does not matter). As for antibiotic use, a boxplot is used to show the NICU percent in the context of the range of a) newborn antibiotic expsure within the NICU Database member NICUs and b) newborn antibiotic exposure at a subset of NICU Database member NICUs based on CCS level. The box plot displays the lower and upper quartile of the newborn antibiotic exposure percent across the reference range as the left and right boundary of the blue box. This means that 25% of the comparison group's NICUs have a value that is lower than the lower quartile (left box boundary), and 25% of the comparison group's NICUs have a value that is higher than the upper quartile (right box boundary). The median antibiotic use value across the reference range of NICUs is displayed as a vertical bar. The box plot also shows the minimum and maximum antibiotic use across the comparison group that is within the lower and upper inner fence defined as 1.5 times the Interquartile Range (IQR=Q3-Q1), i.e., the minimum value at or above Q1 - 1.5 * IQR and the maximum value at or below Q3 + 1.5 * IQR. Note that the inner fence is not displayed in the chart. The reporting NICU's newborn antibiotic exposure percent is shown as a red star.

**Note that - as a balancing measure - data forwarded to CCS includes the incidence per 1,000 live births of early bacterial sepsis by pathogen.**

## Section O. Inventory of Active Perinatal Quality Improvement Projects

This section summarizes quality improvement projects actively pursued in your center in 2018. It was designed to fulfill several purposes:

1. To support the California Children's Services' goal to monitor quality improvement efforts for all CCS-approved units.
2. To fulfill the American Board of Pediatrics' requirement for Quality Improvement Competency Validation for Sub-specialty Recertification for neonatologists.

3. To provide NICU Database member NICUs a convenient summary of neonatal improvement activities that would be useful to submit to the Joint Commission and other similar organizations.

For each project, its title, specific aim, target population, project leader, project leader contact information, description, start date, and project Institute for Health Improvement (IHI) Level are shown. The IHI level assessment may be based on the preliminary NICU Database available in December of the report year with final updates if indicated when NICU Database for the report year closes.

## Section P. NICU Comment

This section can be used by NICUs to share any information regarding their NICU that is relevant for the CCS report.

## Section Q. NICU Attestation and Confirmation Status

Section Q displays information on the current confirmation status of your center's CCS report. Note that the CCS report can only be confirmed from June 2, 2019 at midnight until June 7, 2019 at 11:59 PM. To qualify for the Early Bird Recognition Award confirm the Final CCS Report by June 3, 2019 at 11:59 PM.