# You Aren't Alone:

## What Should Happen After Serious Perinatal Events?

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# Objectives

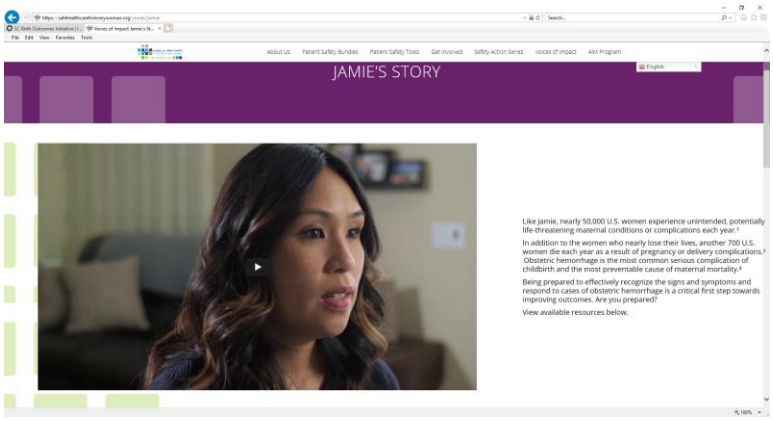
By the end of the program, participants will be able to:

- identify serious perinatal events
- participant will have a better understanding of how healthcare providers address perinatal events and ways to improve outcomes
- to recognize mental, physical and behavioral responses to stress and tips on managing stress
- a better understanding of a medical debrief and how to use a debrief tool

# We all have a story to tell…

- Patient Story:

  https://safehealthcareforeverywoman.org/voices/jamie/




## *What is a Serious Perinatal Event?*

Maternal Mortality & Morbidity

Neonatal Mortality & Morbidity

Sentinel Events

# CDC Definitions: Morbidity

- Defined as any departure, subjective or objective, from a state of physiological or psychological well-being.
  - morbidity encompasses disease, injury, and disability

*Measures of morbidity frequency characterize the number of persons in a population who become ill (incidence) or are ill at a given time (prevalence)*

# CDC Definition: Mortality

- Mortality data indicate numbers of deaths by place, time and cause. WHO's mortality data reflect deaths registered by national civil registration systems of deaths, with the underlying cause of death coded by the national authority.
- A mortality rate is a measure of the frequency of occurrence of death in a defined population during a specified interval.
- Morbidity and mortality measures are often the same mathematically; it's just a matter of what you choose to measure, illness or death.

- The formula for the mortality of a defined population, over a specified period of time, is:

$$\frac{\text{Deaths occurring during a given time period}}{\text{Size of the population among which the deaths occurred}} \times 10\,n$$

https://www.who.int/topics/mortality/en/
https://www.cdc.gov/csels/dsepd/ss1978/index.html

# Perinatal Mortality

- In the United States, population-level health data is primarily derived from birth and death certificates submitted to the National Vital Statistics System (NVSS) by individual states and territories.
  - The standardized terminology and definitions allow direct comparison of important population-level health markers such as birth, death, and outcome rates
- A standard set of reporting measures are reported to the NVSS; however, individual states may choose to collect additional data of importance to their specific population.
  - In the United States, completion of a birth certificate form is required for all births regardless of length of gestation or weight and uses uniform definitions.
  - Fetal death reporting requirements, however, vary by state and may be based on gestational age or birth weight criteria.

Martin, Et al. Fanaroff and Martin's Neonatal-Perinatal Medicine, 11th Ed 2020 Elsevier, Inc.

# Perinatal Mortality – More Definitions

| Commonly Reported Rates (from Table 2.2 Fanaroff and Martin) | |
|---|---|
| Perinatal Mortality (PMR)* | Infant deaths under 7 days of age and fetal deaths ≥ 28 weeks gestation per 1000 live births plus fetal deaths |
| Infant mortality rate (IMR) | Deaths prior to 1 year of life per 1000 live births |
| Neonatal Mortality | Deaths prior to 28 days of life per 1000 live births |
| Post-neonatal mortality | Deaths from 28 days to < 365 days per 1000 live births |
| *PMR definition I is used for international and state-specific comparisons because of differences among countries and states in the completeness of reporting of fetal deaths prior to 28 weeks gestation. | |

| Vital Statistics Definitions (From Table 2.3 Fanaroff & Martin) | |
|---|---|
| Live Birth | The complete expulsion or extraction from the mother of a product of human conception, irrespective of the duration of the pregnancy, which, after such expulsion or extraction, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, 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. |
| Fetal Death | Death before the complete expulsion or extraction from the mother of a product of human conception, irrespective of the duration of the pregnancy that is not an induced termination of pregnancy. The death is indicated by the fact that, after such expulsion or extraction, the fetus does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps. |
| Infant Death | Live birth (as above) that results in death prior to 1 year of life (<365 days) |
| Neonatal Death | Death before 28 days of life |
| Post-Neonatal Death | Death at 28 days to 364 days of life |

Martin, Et al. Fanaroff and Martin's Neonatal-Perinatal Medicine, 11th Ed 2020 Elsevier, Inc.

# Perinatal Mortality

- The National Center for Health Statistics (NCHS) provides two different definitions for Perinatal Mortality
  1. Deaths of infants of less than 7 days of age and fetal deaths of 28 weeks of gestation or more per 1000 live births plus fetal deaths
  2. Infant deaths of less than 28 days of age and fetal deaths of 20 weeks or more per the same denominator.
- World Health Organization (WHO) & American College of Obstetricians and Gynecologists (ACOG)
  - differ slightly and include the number of fetuses and live births weighing at least 500 g rather than using a gestational age cutoff
- National Center for Health Statistics (NCHS)
  - Fetal death means death prior to the complete expulsion or extraction from its mother of a product of human conception, irrespective of the duration of pregnancy and which is not an induced termination of pregnancy. The death is indicated by the fact that after such expulsion or extraction, the fetus does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

Gabbe, S. 2017 Obstetrics: Normal and Problem Pregnancies 7th Ed Elsevier, Inc.

# Maternal Morbidity & Mortality

# Maternal Mortality Rate

The maternal mortality rate is a ratio used to measure mortality associated with pregnancy.
Maternal mortality rate is usually expressed per 100,000 live births.

$$\frac{\text{The numerator is the number of deaths during a given time period among women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.}}{\text{Number of live births reported during the same time period}}$$

https://www.cdc.gov/csels/dsepd/ss1978/index.html

# Maternal Mortality

- It is difficult to accurately measure maternal mortality.
- The most commonly used definitions are those developed by the World Health Organization (WHO).
  - Maternal death is defined as the "death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes."
  - A pregnancy-related death is the "death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death." Late maternal death is the "death of a woman from direct or indirect causes, more than 42 days, but less than 1 year, after termination of pregnancy."

Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice 8th Edition. 2019 Elsevier, Inc.

# Maternal Mortality: Maternal Death (Indirect v/s Direct)

- **Direct obstetric deaths** are those resulting from obstetric complications of the pregnant state (pregnancy, labor, and puerperium) as a consequence of interventions, omissions, or incorrect treatment, or from a chain of events resulting from any of these.
- **Indirect obstetric deaths** are those resulting from previous existing disease or disease that developed during pregnancy and that was not the result of direct obstetric causes, but was aggravated by the physiologic effects of pregnancy.
- Deaths of unknown cause are not classified as either direct or indirect.

Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice 8th Edition. 2019 Elsevier, Inc.

# Maternal Mortality Related Definitions - CDC

There are a variety of terms connected with maternal mortality

| Maternal death: | Pregnancy-associated: | Pregnancy-related: | Pregnancy-associated, but NOT related: | Unable to determine if pregnancy-related or pregnancy-associated, but NOT related | Not pregnancy-related or associated |
|---|---|---|---|---|---|
| • Used by World Health Organization – death of a woman while pregnant or within 42 days of termination of pregnancy, regardless of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not for accidental or incidental causes. | • The death of a woman while pregnant or within one year of the termination of pregnancy, regardless of the cause. | • The death of a woman during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy<br>• This is further defined as the death of a pregnant or postpartum woman was related to her pregnancy<br>• In other words…if this woman was not pregnant, she would not have died. | • The death of a woman during pregnancy or within one year of the end of the pregnancy from a cause that is not related to pregnancy.<br>• This is a woman died for a reason, but not related to the fact that she was pregnant. | • Unable to determine pregnancy-related or pregnancy-associated | • i.e., false positive, woman was not pregnancy within one year of her death |

CDC: Report from nine maternal mortality review Committees - http://reviewtoaction.org/sites/default/files/national-portal material/Report%20from%20Nine%20MMRCs%20final_0.pdf
Review to Action – Working together to prevent maternal mortality http://www.reviewtoaction.org/learn/definitions

# Maternal Morbidity Definition

- "Severe maternal morbidity (SMM) includes unexpected outcomes of labor and delivery that result in significant short- or long-term consequences to a woman's health."
- Indicators from the CDC:

- Acute myocardial infarction
- Aneurysm
- Acute renal failure
- Adult respiratory distress syndrome
- Amniotic fluid embolism
- Cardiac arrest/ventricular fibrillation
- Conversion of cardiac rhythm
- Disseminated intravascular coagulation
- Eclampsia
- Heart failure/arrest during surgery or procedure
- Puerperal cerebrovascular disorders
- Pulmonary edema / Acute heart failure
- Severe anesthesia complications
- Sepsis
- Shock
- Sickle cell disease with crisis
- Air and thrombotic embolism
- Blood transfusion
- Hysterectomy
- Temporary tracheostomy
- Ventilation

https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html

# "Near Miss" or Severe Maternal Morbidity

- "For every maternal death, there are an estimated 100 "near misses" resulting in severe maternal morbidity."
- "Severe morbidity can significantly impact individual quality of life and health care expenditure. Like mortality, severe maternal morbidity disproportionately affects non-Hispanic black women."

Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice 8th Edition. 2019 Elsevier, Inc.

# Notes from the Obstetric Care Consensus Statement on Severe Maternal Morbidity

OBSTETRIC CARE CONSENSUS

Severe Maternal Morbidity: Screening and Review

- Severe maternal morbidity is associate with a high rate of preventability
- Can be considered a "near Miss" for maternal mortality because without identification and treatment, some of these cases may have led to a maternal death.
- ACOG/SMFM/AWHONN/ACNM define Severe Maternal Morbidity as:
  - Unintended outcomes of the process of labor and delivery that result in significant short-term or long-term consequences to a woman's health.
  - There is not a complete consensus among systems/organizations for a list of conditions.

## Looking at Examples of Severe Maternal Morbidity

**Table 1.** Example List of Diagnoses and Complications Constituting Severe Maternal Morbidity*

| Severe Maternal Morbidity | Not Severe Morbidity (insufficient evidence if this is the only criteria) |
|---|---|
| *Hemorrhage* | |
| Obstetric hemorrhage with ≥4 units of red blood cells transfused | Obstetric hemorrhage with 2–3 units of red blood cells transfused ALONE |
| Obstetric hemorrhage with 2 units of red blood cells and 2 units of fresh frozen plasma transfused (without other procedures or complications) if not judged to be overexuberant transfusion | Obstetric hemorrhage with 2 units of red blood cells and 2 units of fresh frozen plasma transfused AND judged to be "overexuberant" |
| Obstetric hemorrhage with <4 units of blood products transfused and evidence of pulmonary congestion that requires >1 dose of furosemide | Obstetric hemorrhage with <4 units of blood products transfused and evidence of pulmonary edema requiring only 1 dose of furosemide |
| Obstetric hemorrhage with return to operating room for any major procedure (excludes dilation) | |
| Any emergency/unplanned peripartum hysterectomy, regardless of number of units transfused (includes all placenta accretas) | Planned peripartum hysterectomy for cancer/neoplasia |
| Obstetric hemorrhage with uterine artery embolization, regardless of number of units transfused | |
| Obstetric hemorrhage with uterine balloon or uterine compression suture placed and 2–3 units of blood products transfused | Obstetric hemorrhage with uterine balloon or uterine compression suture placed and ≤1 unit of blood products transfused |
| Obstetric hemorrhage admitted to intensive care unit for invasive monitoring or treatment (either medication or procedure; not just observed overnight) | Any obstetric hemorrhage that went to the intensive care unit for observation only without further treatment |
| *Hypertension/Neurologic* | |
| Eclamptic seizure(s) or epileptic seizures that were "status" | |
| Continuous infusion (intravenous drip) of an antihypertensive medication | |
| Nonresponsiveness or loss of vision, permanent or temporary (but not momentary), documented in physician's progress notes | |
| Stroke, coma, intracranial hemorrhage | |
| Preeclampsia with difficult-to-control severe hypertension (>160 systolic blood pressure or >110 diastolic blood pressure) that requires multiple intravenous doses, persistent ≥48 hours after delivery, or both | Chronic hypertension that drifts up to severe range and needs postoperative medication dose alteration; preeclampsia blood pressure control with oral medications ≥48 hours after delivery |
| Liver or subcapsular hematoma or severe liver injury admitted to the intensive care unit (bilirubin >6 or liver enzymes >500) | Abnormal liver function requiring extra prolonged postpartum length of stay but not in the intensive care unit |
| Multiple coagulation abnormalities or severe hemolysis, elevated liver enzymes, and low platelet count (HELLP) syndrome | Severe thrombocytopenia (<50,000) alone that does not require a transfusion or intensive care unit admission |
| *Renal* | |
| Diagnosis of acute tubular necrosis or treatment with renal dialysis | Oliguria treated with intravenous fluids (no intensive care unit admission) |
| Oliguria treated with multiple doses of Lasix | Oliguria treated with 1 dose of intravenous fluids (no intensive care unit admission) |
| Creatinine ≥2.0 in a woman without preexisting renal disease OR a doubling of the baseline creatinine in a woman with preexisting renal disease | |

*(continued)*

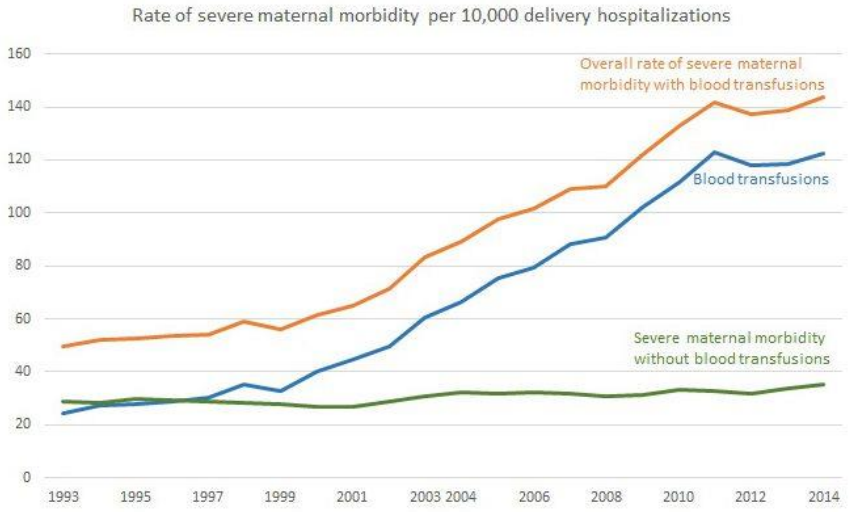
**Table 1.** Example List of Diagnoses and Complications Constituting Severe Maternal Morbidity* *(continued)*

| Severe Maternal Morbidity | Not Severe Morbidity (insufficient evidence if this is the only criteria) |
|---|---|
| *Sepsis* | |
| Infection with hypotension with multiple liters of intravenous fluid or pressors used (septic shock) | Fever >38.5°C with elevated lactate alone without hypotension |
| Infection with pulmonary complications such as pulmonary edema or acute respiratory distress syndrome | Fever >38.5°C with presumed choriomatritis/endometritis with elevated pulse but no other cardiovascular signs and normal lactate |
| | Positive blood culture without other evidence of significant systemic illness |
| *Pulmonary* | |
| Diagnosis of acute respiratory distress syndrome, pulmonary edema, or postoperative pneumonia | Administration of oxygen without a pulmonary diagnosis |
| Use of a ventilator (with either intubation or noninvasive technique) | |
| Deep vein thrombosis or pulmonary embolism | |
| *Cardiac* | |
| Preexisting cardiac disease (congenital or acquired) with intensive care unit admission for treatment | Preexisting cardiac disease (congenital or acquired) with intensive care unit admission for observation only |
| Peripartum cardiomyopathy | Preexisting cardiac disease (congenital or acquired) without intensive care unit admission for observation only |
| Arrhythmia requiring >1 dose of intravenous medication but not intensive care unit admission | Arrhythmia requiring 1 dose of intravenous medication but no intensive care unit admission |
| Arrhythmia that requires intensive care unit with further treatments | Arrhythmia that requires intensive care unit observation but no extra treatments |
| *Intensive Care Unit/Invasive Monitoring* | |
| Any intensive care unit admission that includes treatment or diagnostic or therapeutic procedure | Intensive care unit admission for observation of hypertension that does NOT require intravenous medications |
| Central line or pulmonary catheter used to monitor a complication | Intensive care unit admission for observation after general anesthesia |
| *Surgical, Bladder, and Bowel Complications* | |
| Bowel or bladder injury during surgery beyond minor serosal tear | |
| Small-bowel obstruction, with or without surgery during pregnancy/ postpartum period | |
| Prolonged ileus for ≥4 days | Postoperative ileus that resolved without surgery in ≤3 days |
| *Anesthesia Complications* | |
| Total spinal anesthesia | Failed spinal anesthesia that requires general anesthesia |
| Aspiration pneumonia | Spinal headache treated with a blood patch |
| Epidural hematoma | |

Abbreviation: HELLP, hemolysis, elevated liver enzymes, and low platelet count.

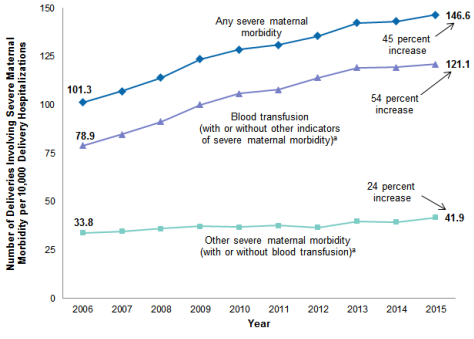
*This list provides a series of examples that may help facilities and health care providers as they evaluate cases to determine if they represent severe maternal morbidity. The College and SMFM have not created or endorsed a single, comprehensive definition of severe maternal morbidity.

Reprinted from Main EK, Abreo A, McNulty J, Gilbert W, McNally C, Poeltler D, et al. Measuring severe maternal morbidity: validation of potential measures. Am J Obstet Gynecol 2016;214:643.e1–10.



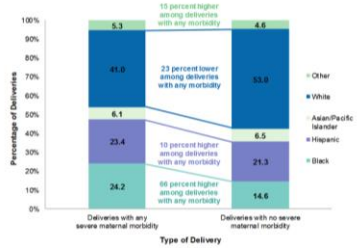

https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html

**Figure 1. Trends in delivery hospitalizations involving severe maternal morbidity, 2006-2015**




## Data Trends

**Figure 3. The distribution of race/ethnicity among delivery hospitalizations, according to whether the delivery involved any severe maternal morbidity, 2015**




Fingar KF (IBM Watson Health), Hambrick MM (AHRQ), Heslin KC (AHRQ), Moore JE (Institute for Medicaid Innovation). Trends and Disparities in Delivery Hospitalizations Involving Severe Maternal Morbidity, 2006-2015. HCUP Statistical Brief #243. September 2018. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/reports/statbriefs/sb243-Severe-Maternal-Morbidity-Delivery-Trends-Disparities.pdf.

# Finding the Numbers for Morbidity & Mortality

TABLE 58-1
ESTIMATED NUMBERS AND INCIDENCE OF THE MAJOR GLOBAL CAUSES OF DIRECT MATERNAL DEATHS AND SEVERE MORBIDITY FOR THE YEAR 2000
Modified from AbouZahr C. Global burden of maternal death. In *British Medical Bulletin. Pregnancy: Reducing Maternal Death and Disability*. British Council. Oxford University Press; 2003, pp. 1-13.

| CAUSE | INCIDENCE OF COMPLICATION (% OF LIVE BIRTHS) | NUMBER OF CASES | CASE FATALITY RATE (%) | DEATHS | % OF ALL DIRECT DEATHS |
|---|---|---|---|---|---|
| Hemorrhage | 10.5 | 13,795,000 | 1.0 | 132,000 | 28% |
| Sepsis | 4.4 | 5,768,000 | 1.3 | 79,000 | 16% |
| Preeclampsia, eclampsia | 3.2 | 4,152,000 | 1.7 | 63,000 | 13% |
| Obstructed labor | 4.6 | 6,038,000 | 0.7 | 42,000 | 9% |
| Abortion | 14.8 | 19,340,000 | 0.3 | 69,000 | 15% |



# CDC/AIM Codes for Severe Maternal Mortality

https://www.cdc.gov/reproductivehealth/maternalinfanthealth/smm/severe-morbidity-ICD.htm
CDC SMM Codes

**Appendix 2. Severe Morbidity Indicators and Corresponding ICD-9-CM/ICD-10-CM/PCS Codes during Delivery Hospitalizations.**

The table below includes the list of 21 indicators and corresponding ICD codes used to identify delivery hospitalizations with SMM.

**Severe Maternal Morbidity Indicators and Corresponding ICD Codes during**

| Severe Maternal Morbidity Indicator | DX or PR |
|---|---|
| 1. Acute myocardial infarction | DX |
| 2. Aneurysm* | DX |
| 3. Acute renal failure | DX |
| 4. Adult respiratory distress syndrome | DX |
| 5. Amniotic fluid embolism | DX |
| 6. Cardiac arrest/ventricular fibrillation* | DX |
| 7. Conversion of cardiac rhythm | PR |
| 8. Disseminated intravascular coagulation | DX |
| 9. Eclampsia | DX |
| 10. Heart failure/arrest during surgery or procedure | DX |
| 11. Puerperal cerebrovascular disorders | DX |
| 12. Pulmonary edema / Acute heart failure | DX |
| 13. Severe anesthesia complications | DX |
| 14. Sepsis | DX |
| 15. Shock | DX |
| 16. Sickle cell disease with crisis | DX |
| 17. Air and thrombotic embolism | DX |
| 18. Blood products transfusion | PR |
| 19. Hysterectomy | PR |
| 20. Temporary tracheostomy* | PR |
| 21.Ventilation | PR |

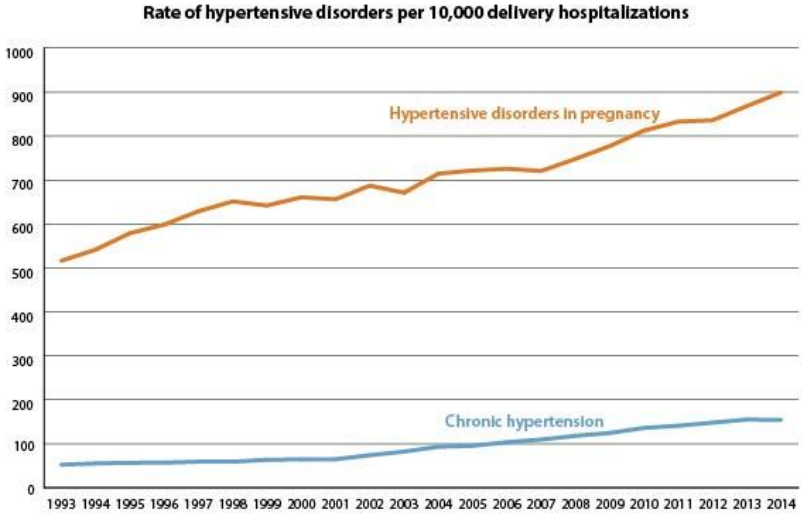
For all pregnancy related codes O00-O9A:
1. are only applicable to maternity patients aged 12 – 55 years inclusive
2. Use a code under Z3A (Z3A.20-Z3A.42) to document the exact week during the pregnancy
3. *Due to rare prevalences, the following indicators may be combined for reporting purposes: 1) Acute myocardial infarction and aneurysm; 2) cardiac arrest/ventricular fibrillation and conversion of cardiac rhythm; and 3) temporary tracheostomy and ventilation.

https://safehealthcareforeverywoman.org/aim-data/

**SMM Numerator | ICD-10 | 2018 ICD-10-CM Diagnosis Codes Pregnancy, childbirth and the puerperium O00-O9A**

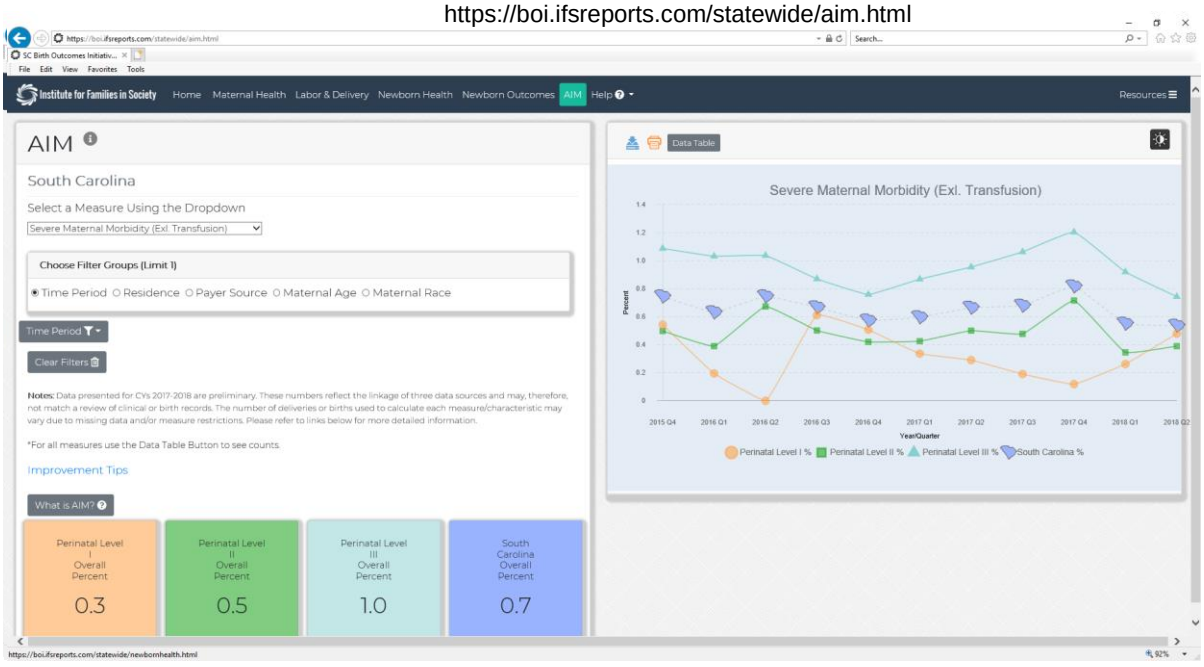
http://www.icd10data.com/ICD10CM/Codes/O00-O9A

| | |
|---|---|
| **DIAGNOSIS** | **ICD-10** |
| | **1. Acute myocardial infarction** |
| | **2. Acute Renal Failure diagnosis** |
| | **3. Adult Respiratory Distress Syndrome diagnosis** |
| | **4. Amniotic fluid embolism** |
| | **5. Aneurysm** |
| | **6. Cardiac arrest/ventricular fibrillation** |
| | **7. Disseminated Intravascular Coagulation** |
| | **8. Eclampsia** |
| | **9. Heart failure/arrest during procedure or surgery** |
| | **12. Puerperal Cerebrovascular Disorder** |
| | **13. Acute Heart Failure / Pulmonary edema** |
| | **14. Severe anesthesia complications** |
| | **15. Sepsis** |
| | **16. Shock** |
| | **17. Sickle Cell Disease with Crisis** |
| | **18. Air and thrombotic embolism** |
| **PROCEDURE** | **ICD-10** |
| | **19. Blood transfusion** |
| | **21. Conversion of cardiac rhythm** |
| | **22. Hysterectomy** |
| | **23. Operations on heart and pericardium** |
| | **24. Temporary tracheostomy** |
| | **25. Ventilation** |




https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-complications-data.htm#hyper

https://boi.ifsreports.com/statewide/aim.html



# Neonatal Morbidity & Mortality

## Infant Mortality

Infant Mortality:

$$\frac{\text{Number of deaths among children < 1 year of age reported during a given time period}}{\text{Number of live births reported during the same time period}}$$

Neonatal mortality rate

- The neonatal period covers birth up to but not including 28 days.

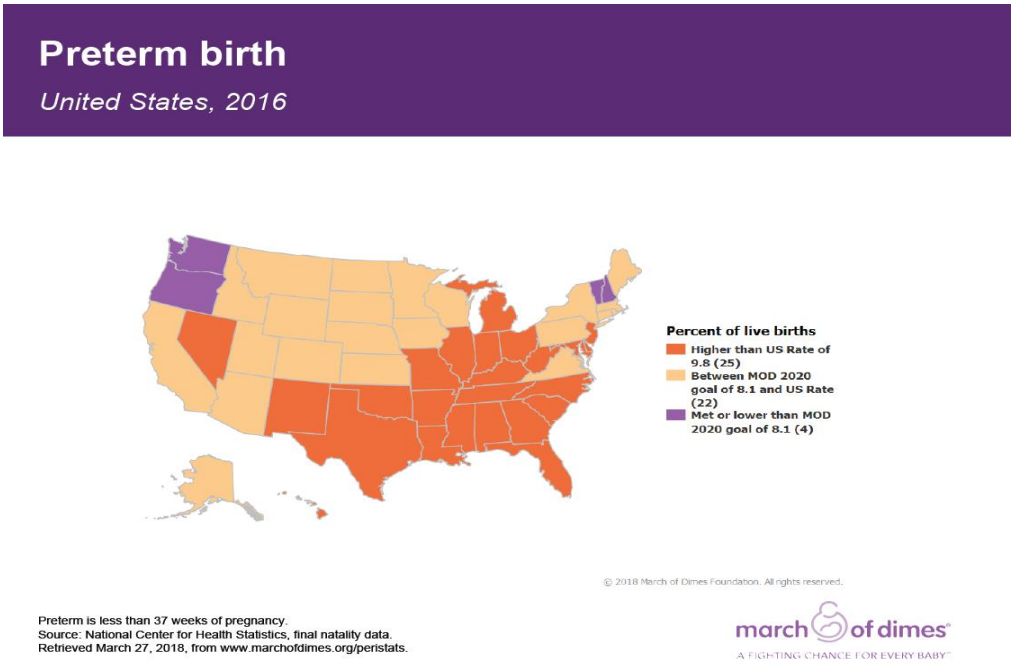
Postneonatal mortality rate

- The postneonatal period is defined as the period from 28 days of age up to but not including 1 year of age.

https://www.cdc.gov/csels/dsepd/ss1978/index.html

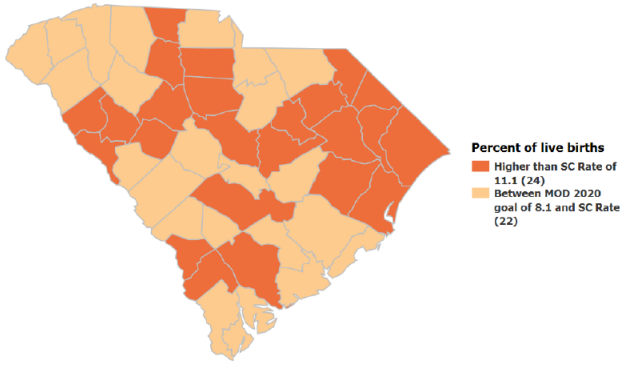
# Why is Prematurity Such a Problem?

- Main cause of death during first month of life
- Continue to deliver prematurely despite advances in medical management
- 1/3 of all infant mortality is attributable directly to prematurity or its related complications
- Cost

## Preterm birth

*South Carolina, 2012-2015 Average*






Preterm is less than 37 weeks of pregnancy.
Source: National Center for Health Statistics, final natality data.
Retrieved March 27, 2018, from www.marchofdimes.org/peristats.

march of dimes
A FIGHTING CHANCE FOR EVERY BABY

### A Profile of Prematurity in United States

PeriStats

In an average week in United States

| 76,509 | 7,465 | 5,252 | 1,214 |
|---|---|---|---|
| babies are born | babies are born preterm | babies are born late preterm | babies are born very preterm |

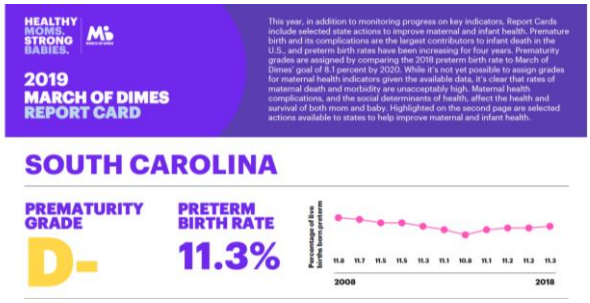
MARCH OF DIMES

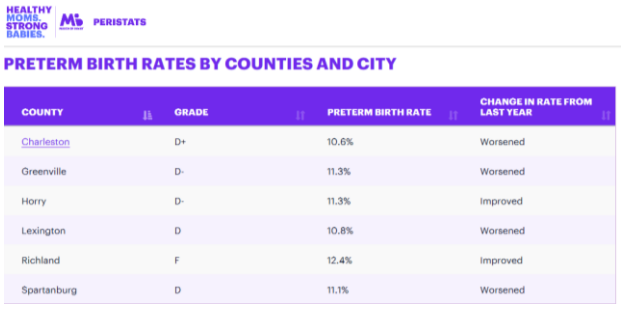
### A Profile of Prematurity in South Carolina

PeriStats

In an average week in South Carolina

| 1,118 | 122 | 85 | 22 |
|---|---|---|---|
| babies are born | babies are born preterm | babies are born late preterm | babies are born very preterm |



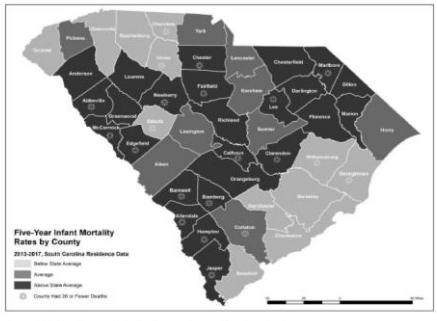




| COUNTY | GRADE | PRETERM BIRTH RATE | CHANGE IN RATE FROM LAST YEAR |
|---|---|---|---|
| Charleston | D+ | 10.6% | Worsened |
| Greenville | D- | 11.3% | Worsened |
| Horry | D- | 11.3% | Improved |
| Lexington | D | 10.8% | Worsened |
| Richland | F | 12.4% | Improved |
| Spartanburg | D | 11.1% | Worsened |

# Infant Mortality in S.C.

- Infant deaths per 1,000 live births
  - 2016: 7.0
  - 2017: 6.5
  - 2018: 7.0

**Figure 2.**
**Five Year Infant Mortality Rates[1] by County**
**South Carolina**
**2013-2017**
**(Residence Data)**




**Above State Average** indicates a rate greater than 7.2.
**State Average** indicates a rate between 5.8 and 7.2 inclusive.
**Below State Average** indicates a rate lower than 5.8.

[1]Rate per 1,000 live births. Rates calculated with 20 or fewer deaths are unreliable and should be used cautiously.

# Neonatal / Infant Morbidity

- Significant morbidities that occurred in infants 22 to 25 weeks gestation who survived their initial neonatal intensive care unit (NICU) admission include:
  - Severe intraventricular hemorrhage (Grade III and IV)
  - Periventricular leukomalacia (PVL)
  - Necrotizing enterocolitis (NEC)
  - Bronchopulmonary dysplasia (BPD)
  - Severe retinopathy of prematurity (ROP) (≥Stage 3)
  - Late-onset infection
    - Most surviving infants less than 26 weeks gestation are likely to have a significant morbidity and the risk of more than one morbidity increases with decreasing gestational age

https://www.uptodate.com/contents/periviable-birth-limit-of-viability

# Periviable Birth

- Definition:
  - Periviable Birth is a delivery occurring from 20 0/7 weeks to 25 6/7 weeks of gestation (Obstetric Care Consensus, June 2016)
- Outcomes:
  - From the 1950's through 1980 death was virtually ensured with delivery of an infant at or before 24 weeks gestation
- Remains true in present day
  - Delivery before 23 weeks gestation typically results in neonatal death (5-6% survival), among rare survivors, significant morbidity is universal (98-100%)
  - Study demonstrated wide variation in practices regarding initiation of resuscitation. May explain variation in survival and survival without impairment, particularly at 22 weeks and 23 weeks

# Why All the Talk?

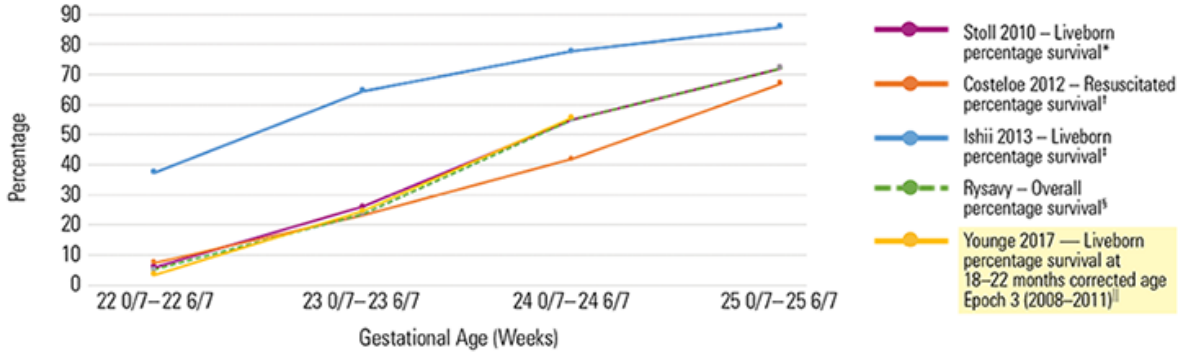
- Recent data has suggested that survival for infants born at less than 23 weeks gestation can be improved if perinatal interventions (antenatal steroids, operative deliveries for fetal distress, neonatal resuscitation) are made on the fetus behalf
- Japan has reported:
  - Intact survival rates for infant born alive at 22 weeks of gestation with overall survival rates of 33%
- United States reported:
  - Similar rates as Japan of survival among newborn infants born at 22 weeks gestation
- Therefore, if survival were the only consideration, it would seem reasonable to offer resuscitation and intensive care to all infants born at or beyond 22 weeks of gestation

# Why All the Talk?

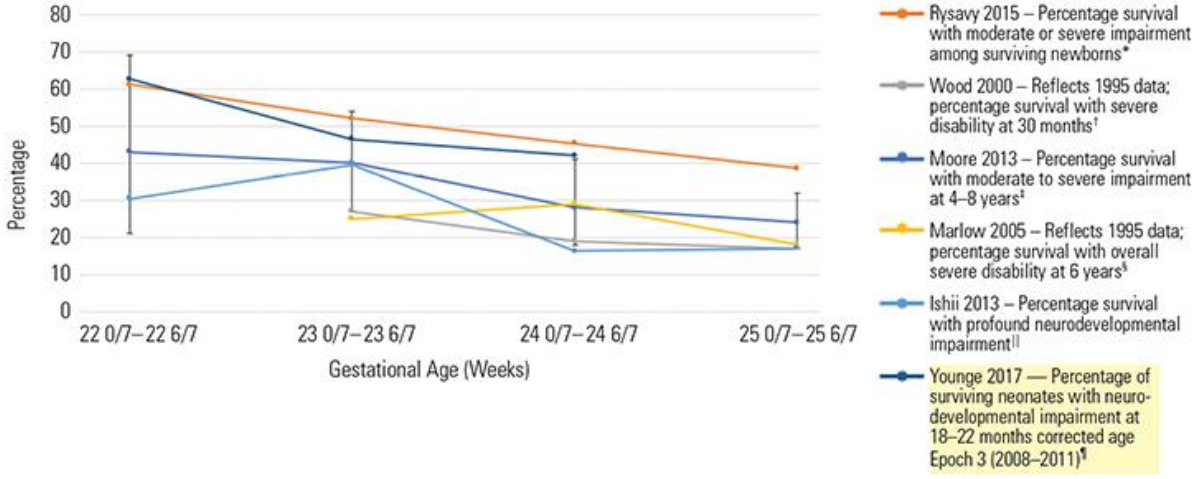
- But data has also shown:
  - Most infants born before 25 weeks gestation will have some degree of neurodevelopmental impairment and possibly long-term problems involving other organ systems
  - Infants born at 22 weeks have reported rates of moderate to severe neurodevelopmental impairment, 85% to 90%
  - Infants born at 23 weeks gestation, rates are not significantly lower
- The risk of permanent, severe neurodevelopmental and other special health needs affect both the infant and the family. These risk may outweigh the benefit of survival alone for some parents.

https://pediatrics.aappublications.org/content/136/3/588

# Percentage of Survival by Gestational Age




# Surviving Neonates with Severe or Moderate Disability by Gestational Age



# NICHD Calculator: Survival and Survival Without Major Morbidity

Enter the characteristics below.

**Gestational Age** *(Best Obstetric Estimate in Completed Weeks)*: 23 weeks

**Birth Weight** *(401 Grams to 1,000 Grams)*: 500 grams

**Sex:** ◉ Female ○ Male

**Singleton Birth:** ◉ Yes ○ No

**Antenatal Corticosteroids** *(Within Seven Days Before Delivery)*: ◉ Yes ○ No

View Outcome Estimates | Clear

Estimated outcomes* for infants in the NRN sample are as follows:

| Outcomes | Outcomes for All Infants | Outcomes for Mechanically Ventilated Infants |
|---|---|---|
| Survival | 27% | 38% |
| Survival Without Profound Neurodevelopmental Impairment | 18% | 25% |
| Survival Without Moderate to Severe Neurodevelopmental Impairment | 11% | 15% |
| Death | 73% | 62% |
| Death or Profound Neurodevelopmental Impairment | 82% | 75% |
| Death or Moderate to Severe Neurodevelopmental Impairment | 89% | 85% |

* These estimates are based on standardized assessments of outcomes at 18 to 22 months of infants born at NRN centers between 1998 and 2003; infants were 22 to 25 weeks, between 401 and 1,000 grams at birth. Infants not born at a Network center and infants with a major congenital anomaly were excluded. The first column of estimates is based on findings for all 4,446 infants in the study. The second column of estimates is based only on the 3,702 infants who received intensive care. The rate of a given outcome had intensive care been attempted for all infants is likely to be intermediate between these two estimates. Sonographic estimates of fetal weight may be used in anticipating birth weight, while assessing the minimum and maximum likely birth weight consistent with the potential error of sonographic estimates.

# NICHD Calculator: Survival and Survival Without Major Morbidity

**Gestational Age** *(Best Obstetric Estimate in Completed Weeks)*: 22 weeks

**Birth Weight** *(401 Grams to 1,000 Grams)*: 500 grams

**Sex:** ◉ Female ○ Male

**Singleton Birth:** ◉ Yes ○ No

**Antenatal Corticosteroids** *(Within Seven Days Before Delivery)*: ◉ Yes ○ No

View Outcome Estimates | Clear

Estimated outcomes* for infants in the NRN sample are as follows:

| Outcomes | Outcomes for All Infants | Outcomes for Mechanically Ventilated Infants |
|---|---|---|
| Survival | 9% | 25% |
| Survival Without Profound Neurodevelopmental Impairment | 5% | 14% |
| Survival Without Moderate to Severe Neurodevelopmental Impairment | 3% | 9% |
| Death | 91% | 75% |
| Death or Profound Neurodevelopmental Impairment | 95% | 86% |
| Death or Moderate to Severe Neurodevelopmental Impairment | 97% | 91% |

* These estimates are based on standardized assessments of outcomes at 18 to 22 months of infants born at NRN centers between 1998 and 2003; infants were 22 to 25 weeks, between 401 and 1,000 grams at birth. Infants not born at a Network center and infants with a major congenital anomaly were excluded. The first column of estimates is based on findings for all 4,446 infants in the study. The second column of estimates is based only on the 3,702 infants who received intensive care. The rate of a given outcome had intensive care been attempted for all infants is likely to be intermediate between these two estimates. Sonographic estimates of fetal weight may be used in anticipating birth weight, while assessing the minimum and maximum likely birth weight consistent with the potential error of sonographic estimates.

Source : NICHD website.

# Limitations to Using NICHD Calculators

- Models do not keep up with advancing medical care
  - Provides a point estimate based on population averages but not individualized to a specific fetus
  - Dating might be inaccurate
  - Does not differentiate between a fetus at 23 0/7 wks. and 23 6/7 wks
  - Newborn weight can only be estimated
- Parental values on outcomes like NDI, death or severe morbidity varies widely and is not factored in
- Response of an individual neonate to resuscitation can never be foreseen

Obstetric Care consensus 2016.

**Table 3.** General Guidance Regarding Obstetric Interventions for Threatened and Imminent Periviable Birth by Best Estimate of Gestational Age*

| | 20 0/7 weeks to 21 6/7 weeks | 22 0/7 weeks to 22 6/7 weeks | 23 0/7 weeks to 23 6/7 weeks | 24 0/7 weeks to 24 6/7 weeks | 25 0/7 weeks to 25 6/7 weeks |
|---|---|---|---|---|---|
| Neonatal assessment for resuscitation* | Not recommended 1A | Consider 2B | Consider 2B | Recommended 1B | Recommended 1B |
| Antenatal corticosteroids | Not recommended 1A | Not recommended 1A | Consider 2B | Recommended 1B | Recommended 1B |
| Tocolysis for preterm labor to allow for antenatal corticosteroid administration | Not recommended 1A | Not recommended 1A | Consider 2B | Recommended 1B | Recommended 1B |
| Magnesium sulfate for neuroprotection | Not recommended 1A | Not recommended 1A | Consider 2B | Recommended 1B | Recommended 1B |
| Antibiotics to prolong latency during expectant management of preterm PROM if delivery is not considered imminent | Consider 2C | Consider 2C | Consider 2B | Recommended 1B | Recommended 1B |
| Intrapartum antibiotics for group B streptococci prophylaxis† | Not recommended 1A | Not recommended 1A | Consider 2B | Recommended 1B | Recommended 1B |
| Cesarean delivery for fetal indication‡ | Not recommended 1A | Not recommended 1A | Consider 2B | Consider 1B | Recommended 1B |

Abbreviation: PROM, premature rupture of membranes.

*Survival of infants born in the periviable period is dependent on resuscitation and support. Between 22 weeks and 25 weeks of gestation, there may be factors in addition to gestational age that will affect the potential for survival and the determination of viability. Importantly, some families, concordant with their values and preferences, may choose to forgo such resuscitation and support. Many of the other decisions on this table will be linked to decisions regarding resuscitation and support and should be considered in that context.

†Group B streptococci carrier, or carrier status unknown

‡For example, persistently abnormal fetal heart rate patterns or biophysical testing, malpresentation

# Periviable Birth Outcomes

| Gestational Age (In Completed Weeks) | Death Before NICU Discharge | Outcomes at 18 to 22 Months Corrected Age* | | |
|---|---|---|---|---|
| | | Death | Death/ Profound Neurodevelopmental Impairment | Death/Moderate to Severe Neuro-developmental Impairment |
| 22 Weeks | 95% | 95% | 98% | 99% |
| 23 Weeks | 74% | 74% | 84% | 91% |
| 24 Weeks | 44% | 44% | 57% | 72% |
| 25 Weeks | 24% | 25% | 38% | 54% |

* Determination of Death/Profound Neurodevelopmental Impairment and Death/Moderate to Severe Neurodevelopmental Impairment based on 4,165 infants whose outcomes were known at 18 to 22 months corrected age; determination of Death based on a denominator of all 4,446 cohort infants.

### Outcomes Only for Mechanically Ventilated Infants in the Sample

| Gestational Age (In Completed Weeks) | Death Before NICU Discharge | Outcomes at 18 to 22 Months Corrected Age** | | |
|---|---|---|---|---|
| | | Death | Death/ Profound Neurodevelopmental Impairment | Death/Moderate to Severe Neuro-developmental Impairment |
| 22 Weeks | 79% | 80% | 90% | 95% |
| 23 Weeks | 63% | 63% | 76% | 87% |
| 24 Weeks | 40% | 41% | 55% | 70% |
| 25 Weeks | 23% | 24% | 37% | 54% |

**For mechanically ventilated infants, determination of Death/Profound Neurodevelopmental Impairment and Death/Moderate to Severe Neurodevelopmental Impairment based on 3,421 infants

# *Should We Resuscitate?*

- Common Ethical Principles
  - Autonomy: Respecting an individual's rights to make choices that affect his or her life
  - Beneficence: acting to benefit others
  - Non-maleficence: avoiding harm
  - Justice: treating people truthfully and fairly
- Exceptions to this rule include
  - Life-threatening medical emergencies and situations where patients are not competent to make their own decisions

- Neonatal resuscitation is a medical treatment often complicated by both of these exceptions

NRP 7th Edition

# Should We Resuscitate?

- Parents Role
  - Surrogate Decision Maker
  - Parents are considered the best surrogate decision maker for their own babies and should be involved in shared decision making whenever possible
  - They must be given relevant, accurate, and honest information about the risks and benefits of each treatment option
  - They must have adequate time to thoughtfully consider each option, ask questions, and seek other opinions
  - Barriers
  - The need for resuscitation is often unexpected emergency with little opportunity to achieve fully informed consent before proceeding
  - A lot of time we do not have all the information prior to delivery and can make it difficult for parents to decide what is in their baby's best interest before birth
    - Extent of congenital anomalies
    - Actual gestational age
    - Likelihood of survival
    - Potential for severe disabilities

NRP 7th Edition

# Should We Resuscitate?

- Doctors Role
  - Give the most accurate prognostic information using all relevant information affecting the prognosis
  - Involve parents in the decision making about whether attempting resuscitation is in their baby's best interest
- What Does NRP 7th Edition State?
  - If the responsible physicians believe that there is no chance for survival, initiation of resuscitation offers no benefit to the baby and should not be offered.

  - Humane, compassionate, and culturally sensitive palliative care focused on ensuring the baby's comfort is the medically and ethically appropriate treatment
  - Example: Confirmed 22 weeks gestation and some severe congenital malformations and chromosomal anomalies

NRP 7th Edition

# Should We Resuscitate?

- Pediatrics
  - Fetal gestational age, as currently estimated, is an imprecise predictor of neonatal survival, but 22 weeks of gestation is generally accepted as the lower threshold of viability
  - Although most infants delivered between 22 and 24 weeks gestation will die in the neonatal period or have significant long-term neurodevelopmental morbidity, outcomes in individual cases are difficult to predict
- Outcomes of infants delivered at 22 to 24 weeks of gestation vary significantly from center to center
  - Because of the uncertain outcomes for infants born at 22-24 weeks gestation, it is reasonable that decision-making regarding the delivery room management be individualized and family centered, taking into account known fetal and maternal conditions and risk factors as well as parental beliefs regarding the best interest of the child


PEDIATRICS

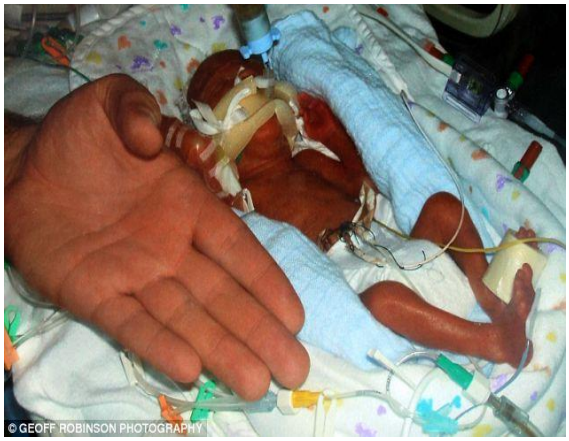
Antenatal Counseling Regarding Resuscitation and Intensive Care Before 25 Weeks of Gestation

# Viability

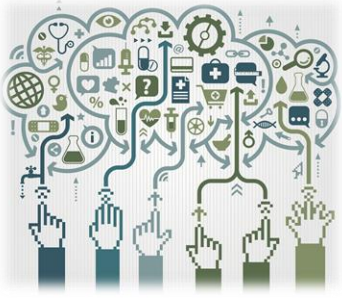
- Definition of  viability
  - Fetal viability: as the word has been used in the US constitutional law since Roe vs Wade, viability is the potential of the fetus to survive outside the uterus after birth, natural or induced, when supported by up-to-date medicine (Wikepidia)
  - The Nuffield Council on Bioethics defines the borderline of viability as an infant born at or before the gestation of 25 weeks
  - Seri and Evans have defined viability as the age at which the infant has a 50% chance of long-term survival
- At present, specific regulations on abortion limits or legal definitions of viability have been delegated to the individual states and territories of the United States ,the majority of these statues have deferred judgment of viability to the attending physician.  32 of those that state of infer a gestation limit ranges from 19-28 weeks.
- SC Defines: "Viability" means that stage of human development when the fetus is potentially able to live outside of the mother's womb with or without the aid of artificial life support systems. For the purposes of this chapter, a legal presumption is hereby created that viability occurs no sooner than the twenty-fourth week of pregnancy.

https://www.scstatehouse.gov/code/t44c041.php

22 Weeks Gestational Age




23 Weeks Gestational Age



# Sentinel Events

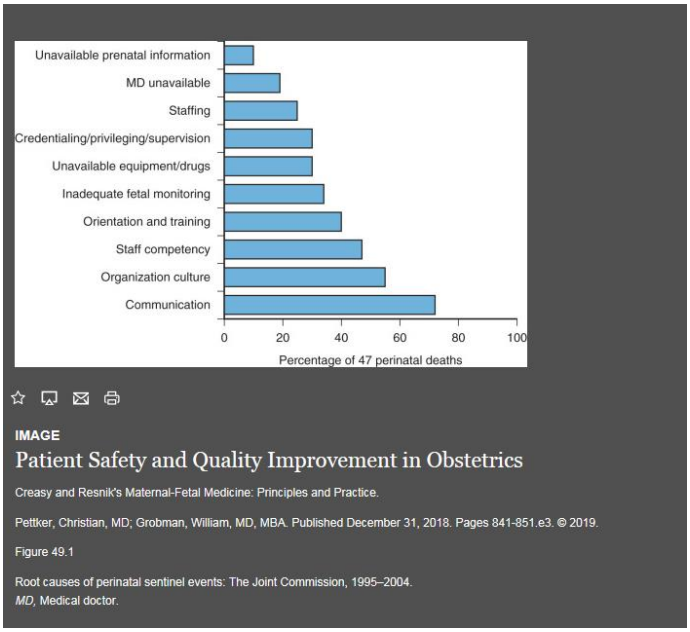
# Sentinel Events – Joint Commission

- Patient safety event: An event, incident, or condition that could have resulted or did result in harm to a patient.
- Adverse event: A patient safety event that resulted in harm to a patient.
- Sentinel event: A subcategory of Adverse Events, a Sentinel Event is a patient safety event (not primarily related to the natural course of the patient's illness or underlying condition) that reaches a patient and results in any of the following:
  - Death
  - Permanent harm
  - Severe temporary harm
- *Close call* or "*near miss*," "*no harm*," or "*good catch*": A patient safety event that did not cause harm as defined by the term *sentinel event*.
- *Hazardous* (or "*unsafe*") *condition(s)*: A circumstance (other than a patient's own disease process or condition) that increases the probability of an adverse event.

**Note:** *It is impossible to determine if there are practical prevention or mitigation countermeasures available without first doing an event analysis. An event analysis will identify systems-level vulnerabilities and weaknesses and the possible remedial or corrective actions that can be implemented*.

https://www.jointcommission.org/assets/1/6/PS_chapter_AHC_2018.pdf

# Joint Commission




https://www.clinicalkey.com/#!/content/book/3-s2.0-B9780323479103000498

# Joint Commission – Risk Reduction Strategies

| Risk Reduction Strategies: | |
|---|---|
| Revise orientation and training process | 70 percent |
| Physician education and counseling | 36 percent |
| Revise communication protocols | 36 percent |
| Reinforce chain-of-communication policy | 28 percent |
| Revise competency assessment | 25 percent |
| Standardize equipment and drug availability | 25 percent |
| Conduct team training | 25 percent |
| Revise consultation and on-call policies and procedures | 23 percent |
| Revise Medical Staff credentialing and privileging process | 21 percent |
| Institute changes in the patient assessment policy | 21 percent |
| Standardize the evaluation and monitoring process | 21 percent |
| Revise the staffing plan and process | 17 percent |
| Adopt American Academy of Pediatrics (AAP), American College of Obstetricians and Gynecologists (ACOG) guidelines for perinatal care | 13 percent |
| Institute mock OB emergency training drills | 11 percent |
| Revise the conflict resolution policy | 8 percent |
| Revise transfer policies and procedures | 4 percent |

# Joint Commission Recommendations

Sentinel Event Alert, Issue 30: Preventing infant death and injury during delivery - July 21, 2004

Since the majority of perinatal death and injury cases reported root causes related to problems with organizational culture and with communication among caregivers, it is recommended that organizations:

1. Conduct team training in perinatal areas to teach staff to work together and communicate more effectively.
2. For high-risk events, such as shoulder dystocia, emergency Cesarean delivery, maternal hemorrhage and neonatal resuscitation, conduct clinical drills to help staff prepare for when such events actually occur, and conduct debriefings to evaluate team performance and identify areas for improvement.
3. Review and apply the ACOG VBAC Practice Bulletin, Vaginal Birth after Cesarean Delivery; the Standards & Guidelines for Professional Nursing Practice in the Care of Women and Newborn from the Association of Women's Health, Obstetric and Neonatal Nurses; and the AAP and ACOG guidelines for perinatal care, including those to:
    a. Develop clear guidelines for fetal monitoring of potential high-risk patients, including nursing protocols for the interpretation of fetal heart rate tracings.
    b. Educate nurses, residents, nurse midwives, and physicians to use standardized terminology to communicate abnormal fetal heart rate tracings.
    c. Review organizational policies regarding the availability of key personnel for emergency interventions.
    d. Ensure that designated neonatal resuscitation areas are fully equipped and functioning (page
    e. Develop guidelines for the transfer of patients to a higher level of care when indicated, if essential services cannot be readily provided per ACOG guidelines
4. Use a standardized maternal fetal record form for each admission.

https://www.jointcommission.org/assets/1/18/SEA_30.PDF

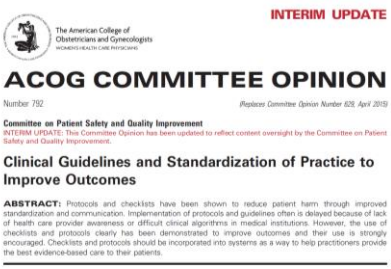
# How Do We Address Serious Perinatal Events?

Safety Bundles

Documentation

Communication

# Current Recommendations for Improving Outcomes



INTERIM UPDATE

The American College of Obstetricians and Gynecologists

**ACOG COMMITTEE OPINION**

Number 792 (Replaces Committee Opinion Number 629, April 2015)

**Committee on Patient Safety and Quality Improvement**

INTERIM UPDATE: This Committee Opinion has been updated to reflect content oversight by the Committee on Patient Safety and Quality Improvement.

**Clinical Guidelines and Standardization of Practice to Improve Outcomes**

**ABSTRACT:** Protocols and checklists have been shown to reduce patient harm through improved standardization and communication. Implementation of protocols and guidelines often is delayed because of lack of health care provider awareness or difficult clinical algorithms in medical institutions. However, the use of checklists and protocols clearly has been demonstrated to improve outcomes and their use is strongly encouraged. Checklists and protocols should be incorporated into systems as a way to help practitioners provide the best evidence-based care to their patients.

The American College of Obstetricians and Gynecologists (the College) makes the following recommendations regarding clinical guidelines and standardization of practice to improve outcomes:

- Protocols and checklists should be recognized as guides to the management of a clinical situation or process of care that will apply to most patients. For any patient whose care cannot be managed by standardized protocols because of clinically valid reasons, the physician should document in the medical record why the protocol or checklist is not being followed.
- Obstetrician–gynecologists should be engaged in the process of developing guidelines and presenting data to help foster stakeholder buy-in and create consensus, thus improving adherence to guidelines and protocols.

ACOG Committee Opinion Number 792, "Clinical Guidelines and Standardization of Practice to Improve Outcomes. 09/2019 – Interim Update

# Process Improvement

- Standardization of practice is an important goal because of the wide variation that exists in many areas of practice within obstetrics and gynecology.
- Performing critical tasks the same way every time can reduce the kind of errors that all human beings are subject to, especially when fatigue is a factor and in stressful environments such as the labor and delivery suite or operating room.
- Elimination of variation in processes has been a cornerstone of improved performance and reliability over the past several decades in commercial aviation, military flight operations, and the nuclear energy industry.
  - OB Example of Standardization: GBS Testing/Treatment
- Standardization of any process of care through the use of protocols and checklists can be expected to achieve a similar reduction in harmful events.

ACOG Committee Opinion Number 792, "Clinical Guidelines and Standardization of Practice to Improve Outcomes. 09/2019 – Interim Update

# Protocol/Checklist Development

- Protocols and checklists should be recognized as a guide to the management of a clinical situation or process of care that will apply to most patients.
  - Randomized controlled trials alone are not necessary to provide evidence that one particular method of approaching a clinical situation is preferable to others before adopting a protocol or algorithm in a clinical setting.
  - Input based on multiple team members in an effort to achieve optimal results, using standardization, will often yield improved results.
- The process to develop protocols must be collaborative, inclusive, and multidisciplinary, and should include hospital administration working with and supporting physicians, nurses, patient advocates, and other staff members.
- When checklists or protocols are developed at a national level, it is often advisable to adapt them to individual practice settings.

# Screening Tool - Obstetric



APPENDIX 1
**Obstetric comorbidity index score form**

**Obstetric Comorbidity Index Score**

Patient Sticker Here

| Maternal Condition | Points | Comments |
|---|---|---|
| Preeclampsia with Severe Features* or Eclampsia | 5 | |
| Preeclampsia / Gestational / Chronic Hypertension | 2 | |
| Congestive Heart Failure | 5 | |
| Pulmonary Hypertension | 4 | |
| Ischemic Heart Disease / Cardiac Arrhythmia | 3 | |
| Congenital Heart and/or Valvular Disease | 4 | |
| Multiple Gestation | 2 | |
| Intrauterine Fetal Demise | 2 | |
| Placenta Previa / Suspected Accreta / Abruption | 4 | |
| Previous Cesarean Delivery / Myomectomy | 1 | |
| Autoimmune Disease / Lupus | 2 | |
| HIV/AIDS | 2 | |
| Sickle Cell Disease / Bleeding Disorder / Coagulopathy / Anticoagulation | 3 | |
| Epilepsy / Cerebrovascular Accident / Neuromuscular Disorder | 2 | |
| Chronic Renal Disease | 1 | |
| Asthma | 1 | |
| Diabetes on Insulin | 1 | |
| Maternal Age > 44 | 3 | |
| Maternal Age 40-44 | 2 | |
| Maternal Age 35-39 | 1 | |
| Substance Use Disorder | 2 | |
| Alcohol Abuse | 1 | |
| BMI > 50 | 3 | |
| BMI > 40 | 2 | |
| *Severe Features: Systolic BP ≥ 160, diastolic BP ≥ 110, creatinine > 1.1, oliguria (<30 cc/hr), elevated AST or ALT, platelets < 100,000, persistent epigastric pain, headache, or scotomata, placental abruption. | Total: | MD Notified: |

Instructions for Use:
1) Circle comorbidities present in your patient and tally score at bottom.
2) Does this patient have any other high-risk features you think should be added to the list? _____
3) Notify Responding Clinician for patients with OB-CMI score > 6 or with any other concerns.
4) Document the OB-CMI score in the nursing handoff template.
5) Place completed sheet in locked bin behind desk.

RN _____ Date _____ Time _____

*Easter et al. OB-CMI for maternal risk assessment. Am J Obstet Gynecol 2019.*




APPENDIX 2
**List and weight of comorbidities from the database-derived obstetric comorbidity index[9]**

| Comorbidity | Weight |
|---|---|
| Severe preeclampsia or eclampsia | 5 |
| Chronic congestive heart failure | 5 |
| Congenital heart disease | 4 |
| Pulmonary hypertension | 4 |
| Chronic ischemic heart disease | 3 |
| Sickle cell disease | 3 |
| Multiple gestation | 2 |
| Cardiac valvular disease | 2 |
| Systemic lupus erythematosus | 2 |
| HIV | 2 |
| Mild or unspecified preeclampsia | 2 |
| Drug abuse | 2 |
| Placenta previa | 2 |
| Chronic renal disease | 1 |
| Preexisting hypertension | 1 |
| Previous cesarean delivery | 1 |
| Gestational hypertension | 1 |
| Alcohol abuse | 1 |
| Asthma | 1 |
| Preexisting diabetes mellitus | 1 |
| Maternal age, y | |
| >44 | 3 |
| 40–44 | 2 |
| 35–39 | 1 |

*Easter et al. OB-CMI for maternal risk assessment. Am J Obstet Gynecol 2019.*

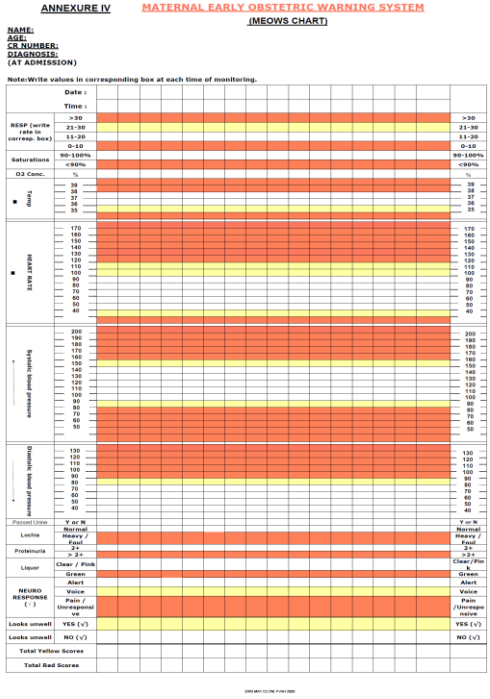
Easter SR, Batemane, BT, Sweeny VH, et al. A comorbidity-based screening tool to predict severe maternal morbidity at the time of delivery. Am J Obstet Gynecol 2019; 221:227.e1-10

# Recognition

- An adverse pregnancy outcome can be seen as continuum of deteriorating event from

Normal / Healthy Pregnancy → Morbidity → Severe Morbidity → Near Miss → Death

- The 'track & trigger' of physiological parameters on a chart can aid in early recognition and treatment of maternal morbidity, thus halting this cascade of severe maternal morbidity and mortality.


ANNEXURE IV MATERNAL EARLY OBSTETRIC WARNING SYSTEM
(MEOWS CHART)

NAME:
AGE:
CR NUMBER:
DIAGNOSIS:
(AT ADMISSION)

Note:Write values in corresponding box at each time of monitoring.

Date :
Time :

RESP (write rate in corresp. box) >30 / 21-30 / 11-20 / 0-10
Saturations 90-100% / <90%
O2 Conc. %
Temp 39 / 38 / 37 / 36 / 35
HEART RATE 170 / 160 / 150 / 140 / 130 / 120 / 110 / 100 / 90 / 80 / 70 / 60 / 50 / 40
Systolic blood pressure 200 / 190 / 180 / 170 / 160 / 150 / 140 / 130 / 120 / 110 / 100 / 90 / 80 / 70 / 60 / 50 / 40
Diastolic blood pressure 130 / 120 / 110 / 100 / 90 / 80 / 70 / 60 / 50 / 40
Passed Urine Y or N
Lochia Normal / Heavy / Foul
Proteinuria Nil / 1+ / 2+ / 3+
Liquor Clear / Pink / Green
NEURO RESPONSE ( ) Alert / Voice / Pain / Unresponsive
Looks unwell YES (√)
Looks unwell NO (√)
Total Yellow Scores
Total Red Scores

Singh, A. Evaluation of maternal early obstetric warning system (MEOWS chart) as a predictor of obstetric morbidity: a prospective observational study European Journal of Obstetrics & Gynecology and Reproductive Biology, 2016-12-01, Volume 207, Pages 11-17.

# "MEOWS"

Maternal Early Warning Obstetric Warning System

TABLE

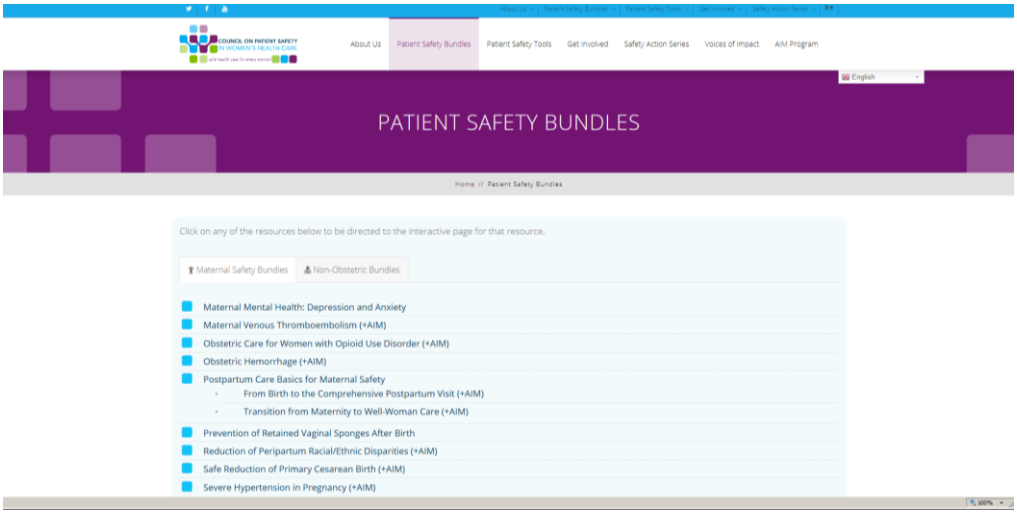
Table 1

Cut-off limits of trigger zones for individual parameters.

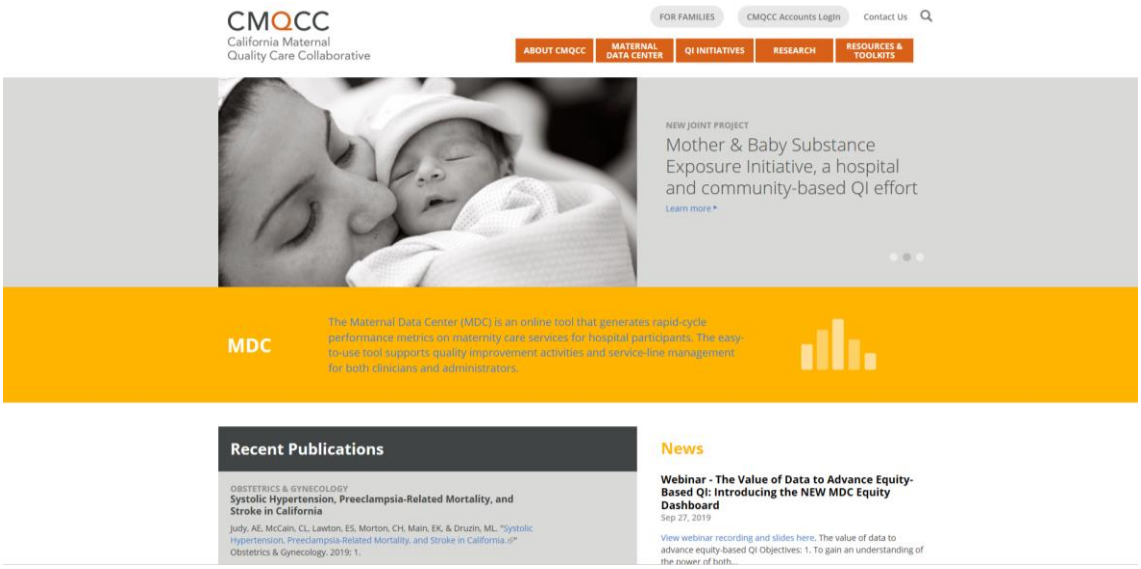
| Parameter | Red trigger | Yellow trigger |
|---|---|---|
| Respiratory rate; breaths/min | <10 or >30 | 21–30 |
| Oxygen saturation; % | <90 | – |
| Heart rate; beats/min | <30 or >120 | 100–120 or 30–40 |
| Systolic BP; mmHg | <80 or >160 | 80–90 or 150–160 |
| Diastolic BP; mmHg | >90 | 80–90 |
| Lochia | Heavy/foul smell | – |
| Proteinuria | >2+ | – |
| Colour of liquor | Green | – |
| Neuroresponse | Unresponsive, pain | Voice |
| General condition | – | Looks unwell |

- A trigger was defined as a single markedly abnormal observation (red trigger) or the combination of two simultaneously mildly abnormal observations (two yellow triggers).

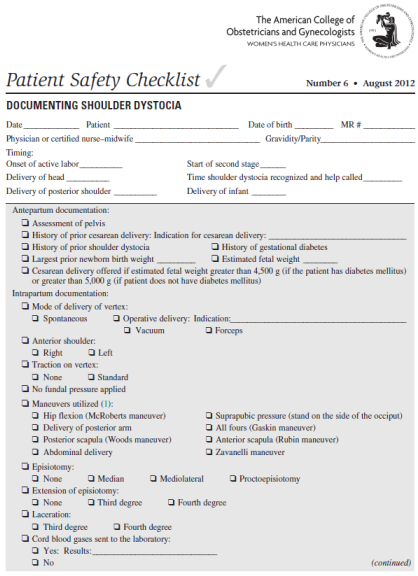
Singh, A.  Evaluation of maternal early obstetric warning system (MEOWS chart) as a predictor of obstetric morbidity: a prospective observational study European Journal of Obstetrics & Gynecology and Reproductive Biology, 2016-12-01, Volume 207, Pages 11-17.




- https://safehealthcareforeverywoman.org/




Check Lists



The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

*Patient Safety Checklist*

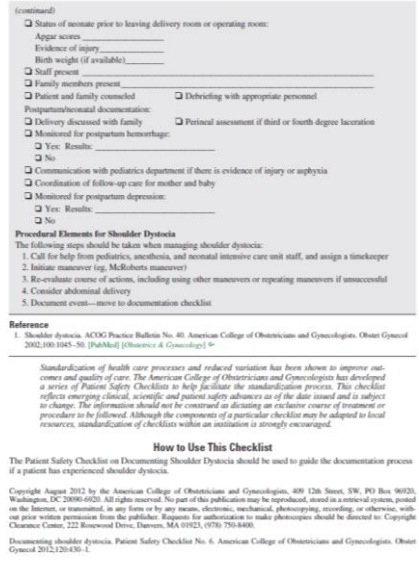
Number 6 • August 2012

**DOCUMENTING SHOULDER DYSTOCIA**

Date_____ Patient _____ Date of birth _____ MR # _____
Physician or certified nurse–midwife _____ Gravidity/Parity_____
Timing:
Onset of active labor_____ Start of second stage_____
Delivery of head _____ Time shoulder dystocia recognized and help called_____
Delivery of posterior shoulder _____ Delivery of infant _____

Antepartum documentation:
❑ Assessment of pelvis
❑ History of prior cesarean delivery: Indication for cesarean delivery: _____
❑ History of prior shoulder dystocia ❑ History of gestational diabetes
❑ Largest prior newborn birth weight _____ ❑ Estimated fetal weight _____
❑ Cesarean delivery offered if estimated fetal weight greater than 4,500 g (if the patient has diabetes mellitus) or greater than 5,000 g (if patient does not have diabetes mellitus)
Intrapartum documentation:
❑ Mode of delivery of vertex:
❑ Spontaneous ❑ Operative delivery: Indication:_____
❑ Vacuum ❑ Forceps
❑ Anterior shoulder:
❑ Right ❑ Left
❑ Traction on vertex:
❑ None ❑ Standard
❑ No fundal pressure applied
❑ Maneuvers utilized (1):
❑ Hip flexion (McRoberts maneuver) ❑ Suprapubic pressure (stand on the side of the occiput)
❑ Delivery of posterior arm ❑ All fours (Gaskin maneuver)
❑ Posterior scapula (Woods maneuver) ❑ Anterior scapula (Rubin maneuver)
❑ Abdominal delivery ❑ Zavanelli maneuver
❑ Episiotomy:
❑ None ❑ Median ❑ Mediolateral ❑ Proctoepisiotomy
❑ Extension of episiotomy:
❑ None ❑ Third degree ❑ Fourth degree
❑ Laceration:
❑ Third degree ❑ Fourth degree
❑ Cord blood gases sent to the laboratory:
❑ Yes: Results:_____
❑ No

*(continued)*



*(continued)*

❑ Status of neonate prior to leaving delivery room or operating room:
Apgar scores _____
Evidence of injury_____
Birth weight (if available)_____
❑ Staff present _____
❑ Family members present_____
❑ Patient and family counseled ❑ Debriefing with appropriate personnel
Postpartum/neonatal documentation:
❑ Delivery discussed with family ❑ Perineal assessment if third or fourth degree laceration
❑ Monitored for postpartum hemorrhage:
❑ Yes: Results: _____
❑ No
❑ Communication with pediatrics department if there is evidence of injury or asphyxia
❑ Coordination of follow-up care for mother and baby
❑ Monitored for postpartum depression:
❑ Yes: Results: _____
❑ No

**Procedural Elements for Shoulder Dystocia**

The following steps should be taken when managing shoulder dystocia:
1. Call for help from pediatrics, anesthesia, and neonatal intensive care unit staff, and assign a timekeeper
2. Initiate maneuver (eg, McRoberts maneuver)
3. Re-evaluate course of actions, including using other maneuvers or repeating maneuvers if unsuccessful
4. Consider abdominal delivery
5. Document event—move to documentation checklist

**Reference**

1. Shoulder dystocia. ACOG Practice Bulletin No. 40. American College of Obstetricians and Gynecologists. Obstet Gynecol 2002;100:1045–50. [PubMed] [Obstetrics & Gynecology]

*Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The American College of Obstetricians and Gynecologists has developed a series of Patient Safety Checklists to help facilitate the standardization process. This checklist reflects emerging clinical, scientific and patient safety advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Although the components of a particular checklist may be adapted to local resources, standardization of checklists within an institution is strongly encouraged.*

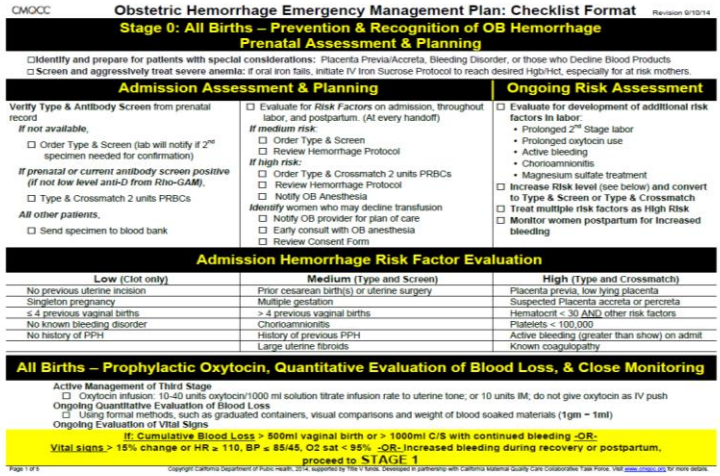
**How to Use This Checklist**

The Patient Safety Checklist on Documenting Shoulder Dystocia should be used to guide the documentation process if a patient has experienced shoulder dystocia.



Documenting shoulder dystocia. Patient Safety Checklist No. 6. American College of Obstetricians and Gynecologists. Obstet Gynecol 2012;120:430–1.

## OBSTETRIC HEMORRHAGE EMERGENCY MANAGEMENT PLAN: CHECKLIST FORMAT



CMQCC **Obstetric Hemorrhage Emergency Management Plan: Checklist Format** Revision 9/10/14

**Stage 0: All Births – Prevention & Recognition of OB Hemorrhage**
**Prenatal Assessment & Planning**

☐**Identify and prepare for patients with special considerations:** Placenta Previa/Accreta, Bleeding Disorder, or those who Decline Blood Products
☐ **Screen and aggressively treat severe anemia:** if oral iron fails, initiate IV Iron Sucrose Protocol to reach desired Hgb/Hct, especially for at risk mothers.

| Admission Assessment & Planning | | Ongoing Risk Assessment |
|---|---|---|
| **Verify Type & Antibody Screen** from prenatal record<br>***If not available,***<br>☐ Order Type & Screen (lab will notify if 2nd specimen needed for confirmation)<br>***If prenatal or current antibody screen positive (if not low level anti-D from Rho-GAM),***<br>☐ Type & Crossmatch 2 units PRBCs<br>***All other patients,***<br>☐ Send specimen to blood bank | ☐ Evaluate for ***Risk Factors*** on admission, throughout labor, and postpartum. (At every handoff)<br>***If medium risk:***<br>☐ Order Type & Screen<br>☐ Review Hemorrhage Protocol<br>***If high risk:***<br>☐ Order Type & Crossmatch 2 units PRBCs<br>☐ Review Hemorrhage Protocol<br>☐ Notify OB Anesthesia<br>***Identify*** women who may decline transfusion<br>☐ Notify OB provider for plan of care<br>☐ Early consult with OB anesthesia<br>☐ Review Consent Form | ☐ **Evaluate for development of additional risk factors in labor:**<br>• Prolonged 2nd Stage labor<br>• Prolonged oxytocin use<br>• Active bleeding<br>• Chorioamnionitis<br>• Magnesium sulfate treatment<br>☐ **Increase Risk level** (see below) **and convert to Type & Screen or Type & Crossmatch**<br>☐ **Treat multiple risk factors as High Risk**<br>☐ **Monitor women postpartum for increased bleeding** |

**Admission Hemorrhage Risk Factor Evaluation**

| Low (Clot only) | Medium (Type and Screen) | High (Type and Crossmatch) |
|---|---|---|
| No previous uterine incision | Prior cesarean birth(s) or uterine surgery | Placenta previa, low lying placenta |
| Singleton pregnancy | Multiple gestation | Suspected Placenta accreta or percreta |
| ≤ 4 previous vaginal births | > 4 previous vaginal births | Hematocrit < 30 AND other risk factors |
| No known bleeding disorder | Chorioamnionitis | Platelets < 100,000 |
| No history of PPH | History of previous PPH | Active bleeding (greater than show) on admit |
| | Large uterine fibroids | Known coagulopathy |

**All Births – Prophylactic Oxytocin, Quantitative Evaluation of Blood Loss, & Close Monitoring**

**Active Management of Third Stage**
☐ Oxytocin infusion: 10-40 units oxytocin/1000 ml solution titrate infusion rate to uterine tone; or 10 units IM; do not give oxytocin as IV push
**Ongoing Quantitative Evaluation of Blood Loss**
☐ Using formal methods, such as graduated containers, visual comparisons and weight of blood soaked materials (**1gm = 1ml**)
**Ongoing Evaluation of Vital Signs**
**If: Cumulative Blood Loss > 500ml vaginal birth or > 1000ml C/S with continued bleeding -OR-**
**Vital signs > 15% change or HR ≥ 110, BP ≤ 85/45, O2 sat < 95% -OR- increased bleeding during recovery or postpartum,**
**proceed to STAGE 1**



www.cmqcc.org

ACOG COMMITTEE OPINION

Quantitative Blood Loss in Obstetric Hemorrhage

**Box 1. Tips for Quantification of Blood Loss During Vaginal Delivery**

Quantification of maternal blood loss is a team effort.

1. Create a list of dry weights for delivery items that may become blood soaked with directions on how to calculate blood loss.
2. Begin quantification of blood loss immediately after the infant's birth (before delivery of the placenta) and assess and record the amount of fluid collected in a calibrated under-buttocks drape. Keep in mind that most of the fluid collected before delivery of the placenta is amniotic fluid, urine, and feces. If irrigation is used, subtract the amount of irrigation from the total fluid that was collected.
3. Record the total volume of fluid collected in the under-buttocks drape.
4. Subtract the preplacental fluid volume from the post placenta fluid volume to more accurately determine the actual blood loss. Keep in mind that most of the fluid collected after the birth of the placenta is blood.
5. Add the fluid volume collected in the drapes to the blood volume measured by weighing soaked items to determine the cumulative volume of blood loss or quantification of blood loss.
6. Weigh all blood-soaked materials and clots to determine cumulative volume. *1 gram weight=1 milliliter blood loss volume.*
7. The equation* used when calculating blood loss of a blood-soaked item is WET *Item Gram Weight - DRY Item Gram Weight=Milliliters of Blood Within the Item.*

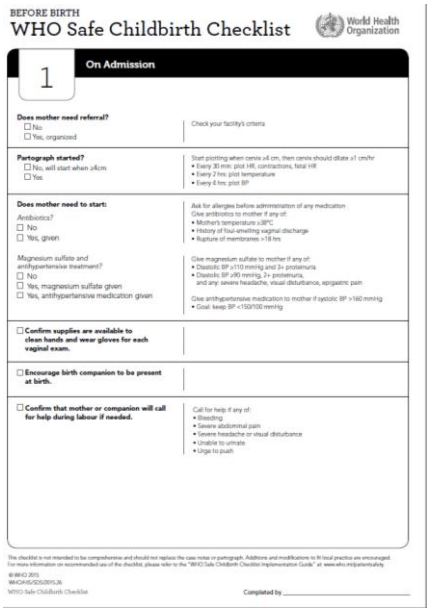
*Although a gram is a unit of mass and a milliliter is a unit of volume, the conversion from one to the other is a simple 1-to-1 conversion.

Adapted from AWHONN Practice Brief. Quantification of Blood Loss: AWHONN Practice Brief Number 1. JOGNN, 44, 158–160; 2015. DOI: 10.1111/1552-6909.1219.

**Box 2. Tips for Quantification of Blood Loss During Cesarean Births**

1. Begin the process of quantification of blood loss when the amniotic membranes are ruptured or after the infant is born.
2. Suction and measure all amniotic fluid within the suction canister of collected fluid before delivery of the placenta.
3. After delivery of the placenta, measure the amount of blood loss in the suction canister and drapes. At this point, most of the blood will be accounted for. Notify the team and document the amount of blood loss in milliliters.
4. Before adding irrigation fluid, ensure that the scrub team communicates when irrigation is beginning. Remember that some of the normal saline will be absorbed into the tissues. For this reason, not all the fluid will be suctioned out of the abdomen and accounted for.
5. One of two methods can be used to suction the irrigation fluid: continue to suction into the same canister and measure the amount of irrigation fluid *or* provide another suction tube to collect the irrigation separately into another canister.
6. Weigh all blood-soaked materials and clots. Calculate the weight and convert to milliliters.
7. At the end of the surgery, add the volume of quantified blood calculated by weight with the volume of quantified blood in the suction canister to determine total quantification of blood loss.
8. Note that lap pads dampened with normal saline contain minimal fluid. When they become saturated with blood, weigh them as you would a dry lap pad.

Adapted from AWHONN Practice Brief. Quantification of Blood Loss: AWHONN Practice Brief Number 1. JOGNN, 44, 158–160; 2015. DOI: 10.1111/1552-6909.1219.



BEFORE BIRTH

WHO Safe Childbirth Checklist

World Health Organization

1 On Admission

**Does mother need referral?**
☐ No
☐ Yes, organized

Check your facility's criteria

**Partograph started?**
☐ No, will start when ≥4cm
☐ Yes

Start plotting when cervix ≥4 cm, then cervix should dilate ≥1 cm/hr
• Every 30 min: plot HR, contractions, fetal HR
• Every 2 hrs: plot temperature
• Every 4 hrs: plot BP

**Does mother need to start:**

Antibiotics?
☐ No
☐ Yes, given

Ask for allergies before administration of any medication
Give antibiotics to mother if any of:
• Mother's temperature ≥38°C
• History of foul-smelling vaginal discharge
• Rupture of membranes >18 hrs

Magnesium sulfate and antihypertensive treatment?
☐ No
☐ Yes, magnesium sulfate given
☐ Yes, antihypertensive medication given

Give magnesium sulfate to mother if any of:
• Diastolic BP ≥110 mmHg and 3+ proteinuria
• Diastolic BP ≥90 mmHg, 2+ proteinuria, and any: severe headache, visual disturbance, epigastric pain

Give antihypertensive medication to mother if systolic BP >160 mmHg
• Goal: keep BP <150/100 mmHg

☐ **Confirm supplies are available to clean hands and wear gloves for each vaginal exam.**

☐ **Encourage birth companion to be present at birth.**

☐ **Confirm that mother or companion will call for help during labour if needed.**

Call for help if any of:
• Bleeding
• Severe abdominal pain
• Severe headache or visual disturbance
• Unable to urinate
• Urge to push

This checklist is not intended to be comprehensive and should not replace the case notes or partograph. Additions and modifications to fit local practice are encouraged. For more information on recommended use of the checklist, please refer to the "WHO Safe Childbirth Checklist Implementation Guide" at www.who.int/patientsafety

© WHO 2015
WHO/HIS/SDS/2015.26
WHO Safe Childbirth Checklist

Completed by _____

- G:\Articles\2019-12 Debrief\WHO_HIS_SDS_2015.26_eng.pdf

# Periviability Communication

- When a delivery is anticipated near the limit of viability, families and health care teams are faced with complex and ethically challenging decisions
- Current model is shared decision making between health care professionals and parents
- Ongoing ethical debate with who should have the final word when health care professionals and parents do not agree
- End-of-life Decision

# Focus on Teamwork: NRP Key Behavioral Skills

| Behavior | Example |
|---|---|
| Anticipate and plan | Plan how you will provide antenatal counseling and manage difficult ethical decisions. Develop protocol when caring for a dying baby and supporting grieving family |
| Communicate effectively | When counseling parents, use clear language and terminology that they will understand. Visual aids and written material may be helpful. Use an appropriately trained medical interpreter if needed |
| Use available resources. Call for additional help when needed | Become familiar with resources in your hospital and community that can help to resolve conflicts, answer legal questions, and provide bereavement services. Consult your RPC if needed |
| Maintain professional behavior | Ensure the healthcare team understand the treatment plan |
| Know your environment | Understand the cultural and religious expectations surrounding death in your community |

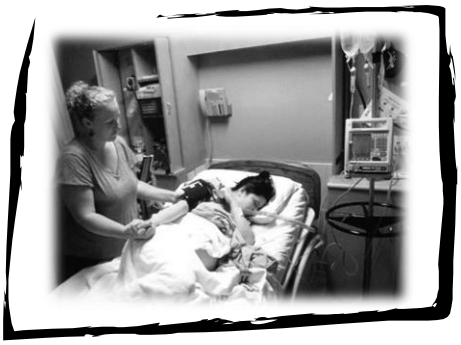
NRP 7th Edition

# Neonatal Resuscitation Documentation

- Quality of resuscitation and stabilization has significant effect on morbidity and mortality
- Study by 6 North American Institutions showed
  - No standardization with documentation
  - Significant variations with institutions
  - Items documented vary
  - Who documents vary
  - Conclusion of study
  - Understanding variations by institutions would lead to standardization of neonatal resuscitation documentation
- NRP 7th Edition
  - No formal resuscitation form

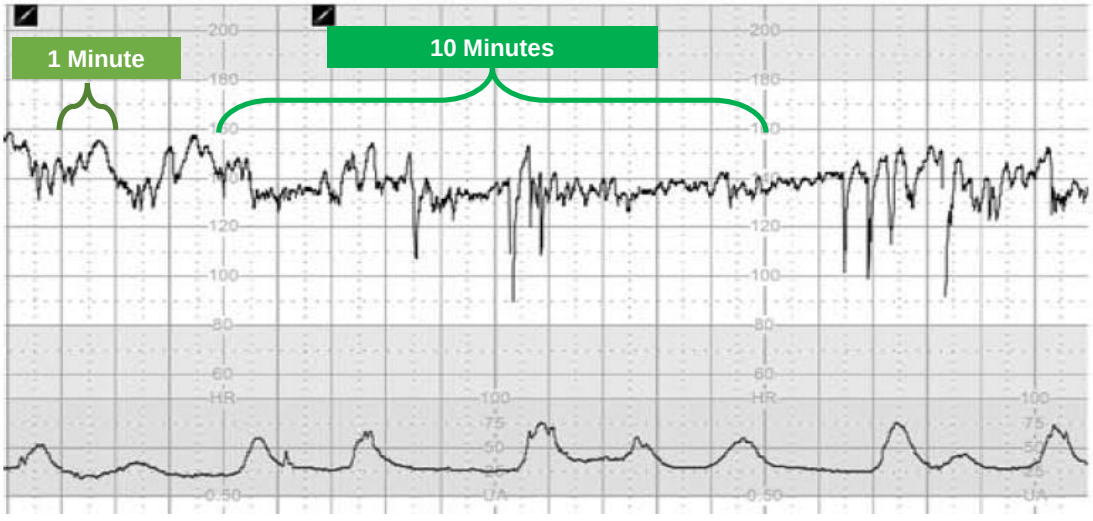
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4647697/

# Case Sample



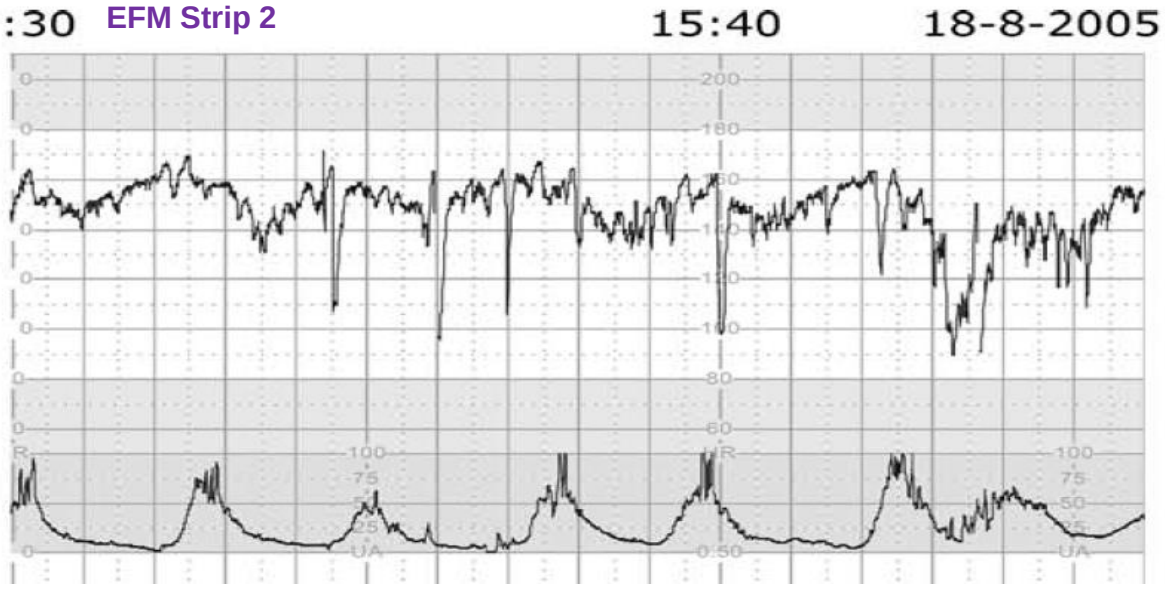
Case Adapted from: Westerhuis M, Kwee A, van Ginkel A, Drogtrop A, Gyselaers W, Visser G. Limitations of ST analysis in clinical practice: three cases of intrapartum metabolic acidosis. BJOG 2007; DOI: 10.1111/j.1471-0528.2007.01236.x.

**EFM Strip 1** 11:40 18-8-2005 11:50



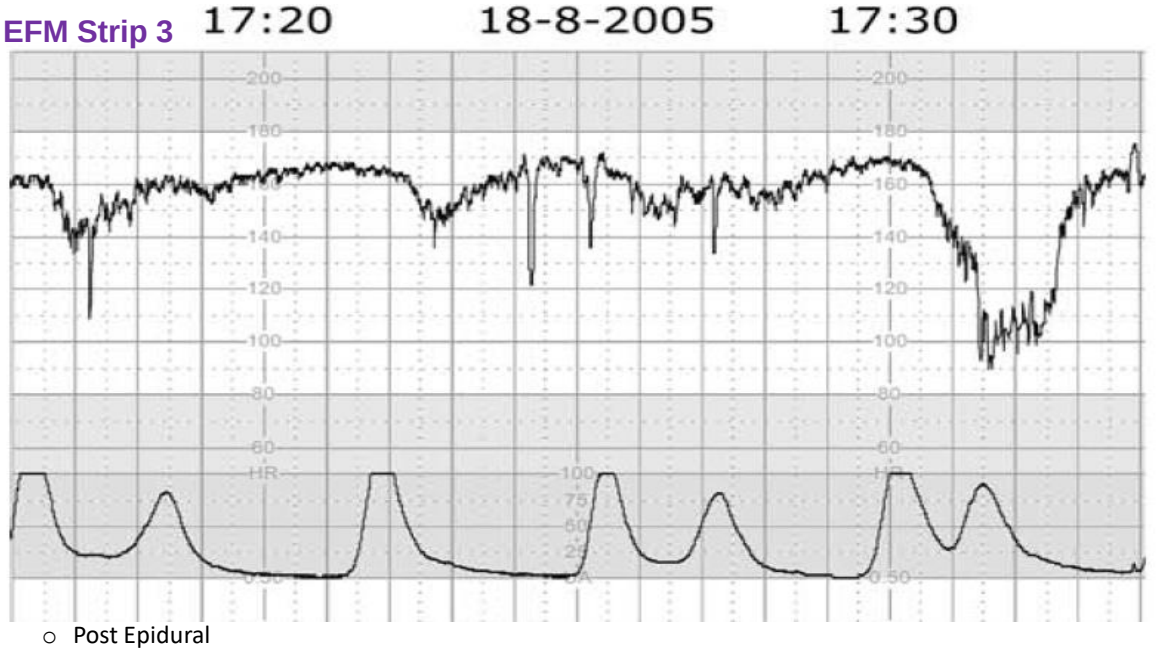

- A 24-year-old Gravida 1 Para 0 woman had an uncomplicated pregnancy until 40 weeks of gestation. Labor was induced because of oligohydramnios and reduced fetal movements.
- Began cervidil induction on day 1 in evening; Morning of 2 day – AROM and start Oxytocin induction

## EFM Strip 2



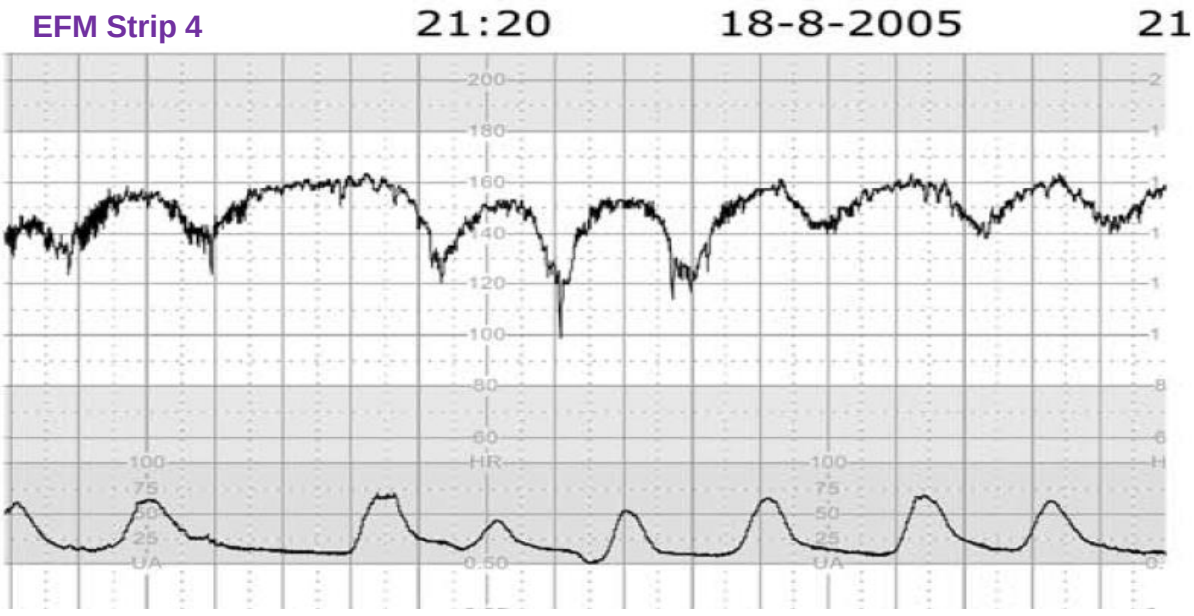

- Oxytocin running
- Prep for Epidural

## EFM Strip 3



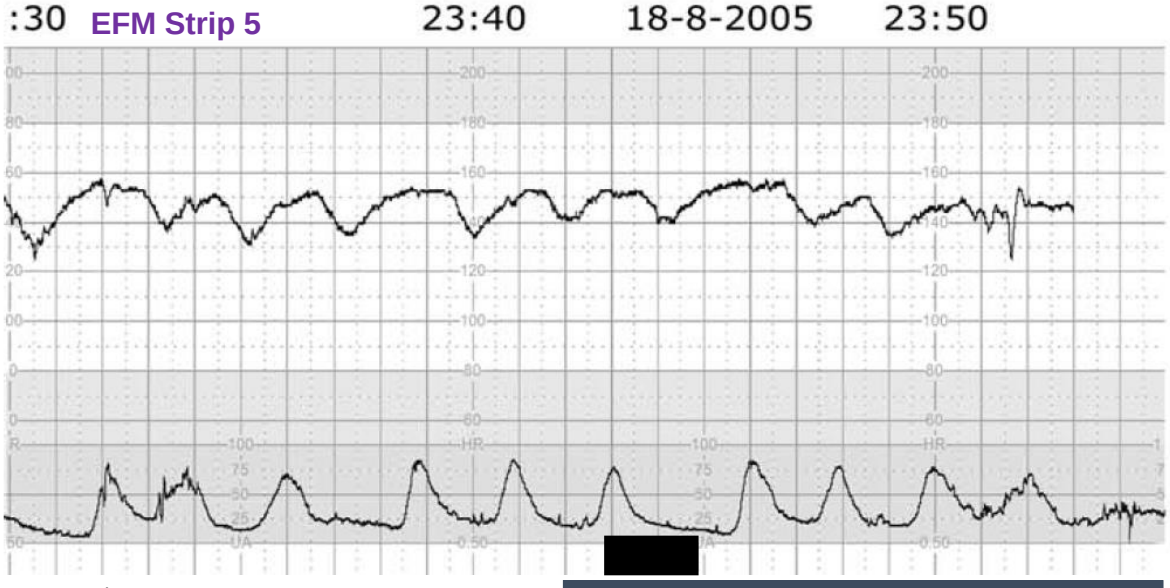

- Post Epidural

**EFM Strip 4**




- SVE:  8cm
- Maternal fever – IV antibiotics started

**EFM Strip 5**




- Final Tracing
- Epidural Off – intrauterine resuscitation

# Neonatal Information

- Born at Level II Center
- Red Flags
  - Apgar's: 1min: 1 5 min: 3 10 min: 4
  - Cord gas: 6.98/86/20/-14.3
  - Heart rate in 50's with no respiratory effort
  - No spontaneous activity and no tone
  - Infant required PPV for 30 seconds with no improvement in heart rate
  - Chest compressions started and continued to bag via neopuff
  - At 5 minutes of life, heart rate 193, spontaneous breathing noted, PPV stopped and placed on CPAP
  - Infant with grunting, retracting and oxygen saturations 95%

# Neonatal Information

- Management of Neonate
  - Passive cooling started by turning off radiant heat warmer
  - CBG: 7.12/62/20/ (blood gas did not give base result)
  - Infant transported to Level III center
    - Cooling continued via transport isolette
    - Transported on CPAP +6, 25%
- Admission Management in Level III Center
  - Continue CPAP, UAC/UVC placed
  - Exam with decreased tone and activity
  - None vigorous
  - Frog-legged position
  - Weak suck and incomplete Moro

# Neonate Continued

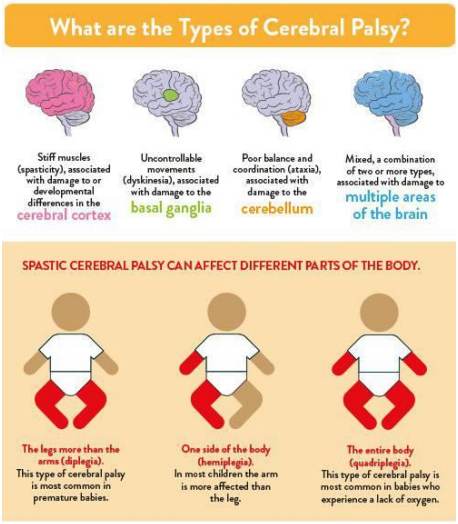
- Admission Management in Level III Center
  - STABLE exam completed and infant qualified for "Whole Body Cooling"
  - Cooling started per protocol
- Daily Management
  - HUS completed and normal
  - Weaned to room air on 10/7/19
  - Exam showed good tone and appropriate responsiveness
  - Infant cooled per protocol for 72 hours.

# Neonate Continued

- MRI after rewarmed
  - Patchy foci of perventricular hemorrhagic ischemic change. Small foci of cortical/subcortical ischemic change with minimal accompanying left-sided hemorrhage involving occipal lobes.
- Neurology consulted with no further evaluation or intervention recommended
- Infant discharged home with Babynet referral and to be closely monitored by PCP for developmental milestones

# Cerebral Palsy

- Spastic Cerebral Palsy
  - Most common, making up to 70-80% of cases
  - Caused by damage to brain's motor cortex which controls voluntary movement
  - Also caused by damage to pyramidal tracts which help relay signals to the muscles
- Common Signs and Symptoms
  - Awkward reflexes
  - Stiffness in one part of the body
  - Contractures (permanently tightened muscles or joints)
  - Abnormal gait




# Neonatal Encephalopathy (Acute Intrapartum Hypoxic Event)

- It is now known that there are multiple potential causal pathways that lead to cerebral palsy in term infants, and the signs and symptoms of neonatal encephalopathy may range from mild to severe, depending on the nature and timing of the brain injury.

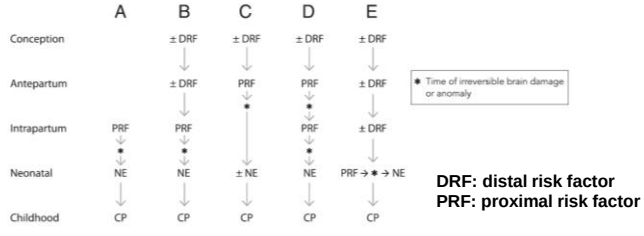



**FIGURE 1**

Prenatal and perinatal causal pathways to cerebral palsy in term infants. Distal risk factors exert a pathogenic effect on fetal brain development starting at a time that is remote from the onset of irreversible brain injury. Examples include genetic abnormalities, environmental and sociodemographic factors, and some placental abnormalities. Proximal risk factors exert pathogenic effects on fetal brain development at a time that closely predates or coincides with the onset of irreversible brain injury. Examples include abruptio placentae, chorioamnionitis, and twin–twin transfusion. There are multiple potential causal pathways that lead to cerebral palsy in term infants, and the signs and symptoms of neonatal encephalopathy may range from mild to severe, depending on the nature and timing of the brain injury. **A**. Intrapartum brain injury that is due to a proximal risk factor may lead to neonatal encephalopathy and subsequent cerebral palsy. **B**. Intrapartum brain injury may be the result of both distal and proximal risk factors that predispose the fetus to brain injury and cerebral palsy. **C**. Brain injury or anomaly may occur in the antepartum period as a result of distal and proximal risk factors. When brain injury or anomaly occurs at a time that is remote from the delivery process, neonatal encephalopathy may or may not be seen after birth. **D**. Brain injury may occur at multiple points during gestation. **E**. Proximal risk factor and brain injury may occur in the neonatal period following predisposing distal risk factors. Abbreviations: DRF, distal risk factor; PRF, proximal risk factor.

Neonatal Encephalopathy and Neurologic Outcome, Second Edition *Pediatrics* 2014;133;e1482

# Cerebral Palsy from Intrapartum/Peripartum Event

I. Case Definition
II. Neonatal Signs Consistent with an Acute Peripartum or Intrapartum Event
III. Type and Timing of Contributing Factors that are Consistent with and Acute Peripartum or Intrapartum Event
IV. Developmental Outcome is Spastic Quadriplegia or Dyskinetic Cerebral Palsy

Neonatal Encephalopathy and Neurologic Outcome, Second Edition *Pediatrics* 2014;133;e1482

# I. Case Definition

- Neonatal encephalopathy is a clinically defined syndrome of disturbed neurologic function in the earliest days of life in an infant born at or beyond 35 weeks of gestation, manifested by a subnormal level of consciousness or seizures, and often accompanied by difficulty with initiating and maintaining respiration and depression of tone and reflexes.

# II. Neonatal Signs Consistent with an Acute Peripartum or Intrapartum Event

A. Apgar Score of Less Than 5 at 5 Minutes and 10 Minutes
B. Fetal Umbilical Artery Acidemia
C. Neuroimaging Evidence of Acute Brain Injury Seen on Brain MRI or Magnetic Resonance Spectroscopy Consistent With Hypoxia–Ischemia
D. Presence of Multisystem Organ Failure Consistent With Hypoxic–Ischemic Encephalopathy

Neonatal Encephalopathy and Neurologic Outcome, Second Edition *Pediatrics* 2014;133;e1482

# III. Type and Timing of Contributing Factors that are Consistent with and Acute Peripartum or Intrapartum Event.

A. A Sentinel Hypoxic or Ischemic Event Occurring Immediately Before or During Labor and Delivery
B. Fetal Heart Rate Monitor Patterns Consistent With an Acute Peripartum or Intrapartum Event
C. Timing and Type of Brain Injury Patterns Based on Imaging Studies Consistent With an Etiology of an Acute Peripartum or Intrapartum Event
D. No Evidence of Other Proximal or Distal Factors That Could Be Contributing Factors

Neonatal Encephalopathy and Neurologic Outcome, Second Edition *Pediatrics* 2014;133;e1482

# IV. Developmental Outcome is Spastic Quadriplegia or Dyskinetic Cerebral Palsy

A. Other subtypes of cerebral palsy are less likely to be associated with acute intrapartum hypoxic–ischemic events.
B. Other developmental abnormalities may occur, but they are not specific to acute intrapartum hypoxic–ischemic encephalopathy and may arise from a variety of other causes.

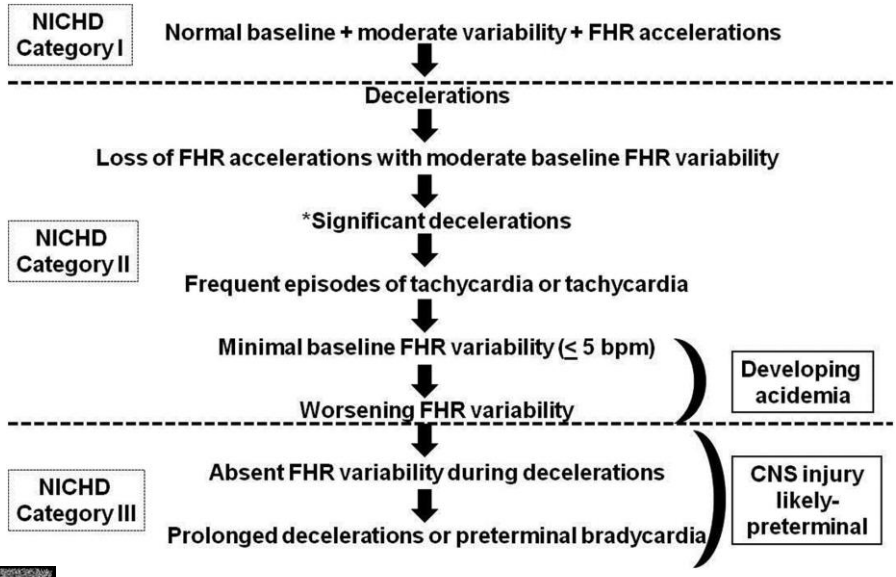
Neonatal Encephalopathy and Neurologic Outcome, Second Edition *Pediatrics* 2014;133;e1482

# Did This Case Qualify as Intrapartum event?

| | Cerebral Palsy from Intrapartum Event | Qualify? Y/N |
|---|---|---|
| 1 | Case Definition | YES |
| 2 | Neonatal Signs Consistent with an Acute Peripartum or Intrapartum Event | YES |
| 3 | Type and Timing of Contributing Factors that are Consistent with and Acute Peripartum or Intrapartum Event | YES |
| 4 | Developmental Outcome is Spastic Quadriplegia or Dyskinetic Cerebral Palsy | Yes |

# Does EFM in Labor Improve Outcome?

- No significant differences between techniques were noted for the following newborn/childhood outcomes:
  - Acidemia (measured in cord blood)
  - Apgar score <4 at five minutes
  - Neonatal intensive care unit admission
  - Hypoxic ischemic encephalopathy
  - Perinatal mortality
  - Neurodevelopmental impairment at ≥12 months of age
  - Cerebral palsy
- Although use of continuous electronic FHR monitoring resulted in fewer neonatal seizures, there were no differences in long-term neurologic outcomes.
- Continuous electronic FHR monitoring resulted in:
  - More operative vaginal deliveries for abnormal FHR patterns or acidosis
  - Fewer spontaneous vaginal births
  - More cesarean deliveries for abnormal FHR patterns or acidosis.
  - Overall risks of instrumental vaginal and cesarean delivery were also statistically increased




*American Journal of Obstetrics & Gynecology* 2016 215, 261-264DOI: (10.1016/j.ajog.2016.05.046)

# Work-Related Stress and Debriefing

Stress in the Workplace

Managing Stress

Debrief

## Stress in the Workplace

- Professions that involve human contact and rapid decision-making are among the most stressful work environments
- Workplace anxiety can lead to a lower quality of care and professional satisfaction
- Work-related stress can effect the medical professional's family, leading to a lower quality of life

## Mental Responses to Stress Include:

- Depression
- Anxiety
- Emotional withdrawal
- Loss of empathy for patients

## Physical Responses to Stress Include:

- Migraines
- Skin rashes
- Irritable bowel syndrome
- Cardiovascular diseases and stroke

## Behavioral Responses to Stress Include:

- Irritability
- Alcoholism and other addictive behaviors

## Helpful Tips on Managing Stress

- Track your stressors:
  - Record your thoughts and reactions to stressors you commonly experience
- Develop healthy responses:
  - Exercise
  - Hobbies / Take time off
  - Avoid fast food
  - Avoid alcohol

# Helpful Tips on Managing Stress

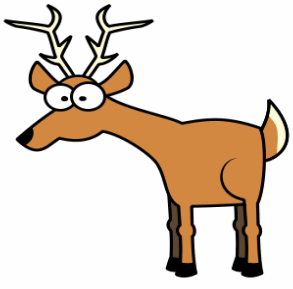
- Establish Boundaries:
  - Do your best to not take work home
  - Avoid checking emails while not at work
- Talk to your supervisor:
  - Not a time to complain
  - A time to find solutions
- Seek support from family and friends

- Forgetting
- Fatigue / Boredom
- Sensory/Perception Limitations
- Task Saturation & Shedding
- Tunnel Vision & Monitor Fixation
- Unfamiliar / Untrained

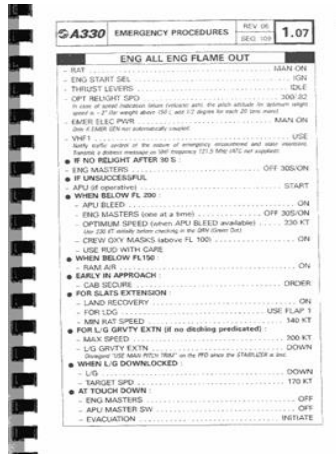
- Family & Life's Pressures!!!

# Patient Harm is a Chain of Events


# Misadventures Will Happen



# Avoid Negative Thinking

A330 EMERGENCY PROCEDURES REV. 06 SEQ. 109 **1.07**

**ENG ALL ENG FLAME OUT**

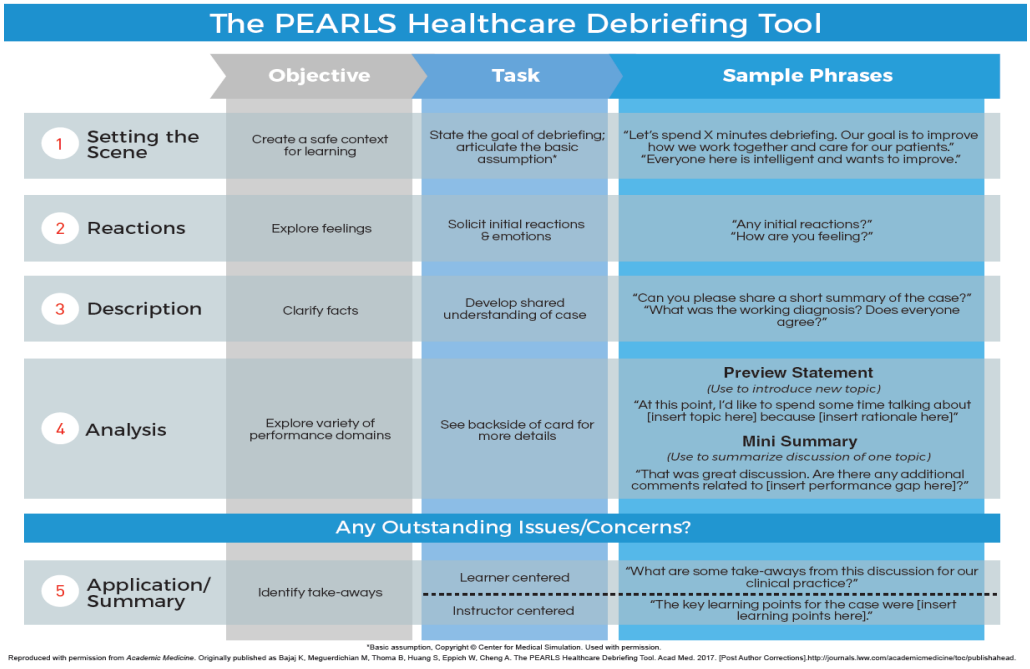
- RAT ..... MAN ON
- ENG START SEL ..... IGN
- THRUST LEVERS ..... IDLE
- OPT RELIGHT SPD ..... 300 /.82
- EMER ELEC PWR ..... MAN ON
- VHF1 ..... USE
- **IF NO RELIGHT AFTER 30 S :**
  - ENG MASTERS ..... OFF 30S/ON
- **IF UNSUCCESSFUL**
  - APU (if operative) ..... START
- **WHEN BELOW FL 200 :**
  - APU BLEED ..... ON
  - ENG MASTERS (one at a time) ..... OFF 30S/ON
  - OPTIMUM SPEED (when APU BLEED available) ..... 330 KT
  - CREW OXY MASKS (above FL 100) ..... ON
  - USE RUD WITH CARE
- **WHEN BELOW FL150 :**
  - RAM AIR ..... ON
- **EARLY IN APPROACH :**
  - CAB SECURE ..... ORDER
- **FOR SLATS EXTENSION :**
  - LAND RECOVERY ..... ON
  - FOR LDG ..... USE FLAP 1
  - MIN RAT SPEED ..... 140 KT
- **FOR L/G GRVTY EXTN (if no ditching predicated) :**
  - MAX SPEED ..... 300 KT
  - L/G GRVTY EXTN ..... DOWN
- **WHEN L/G DOWNLOCKED :**
  - L/G ..... DOWN
  - TARGET SPD ..... 170 KT
- **AT TOUCH DOWN :**
  - ENG MASTERS ..... OFF
  - APU MASTER SW ..... OFF
  - EVACUATION ..... INITIATE

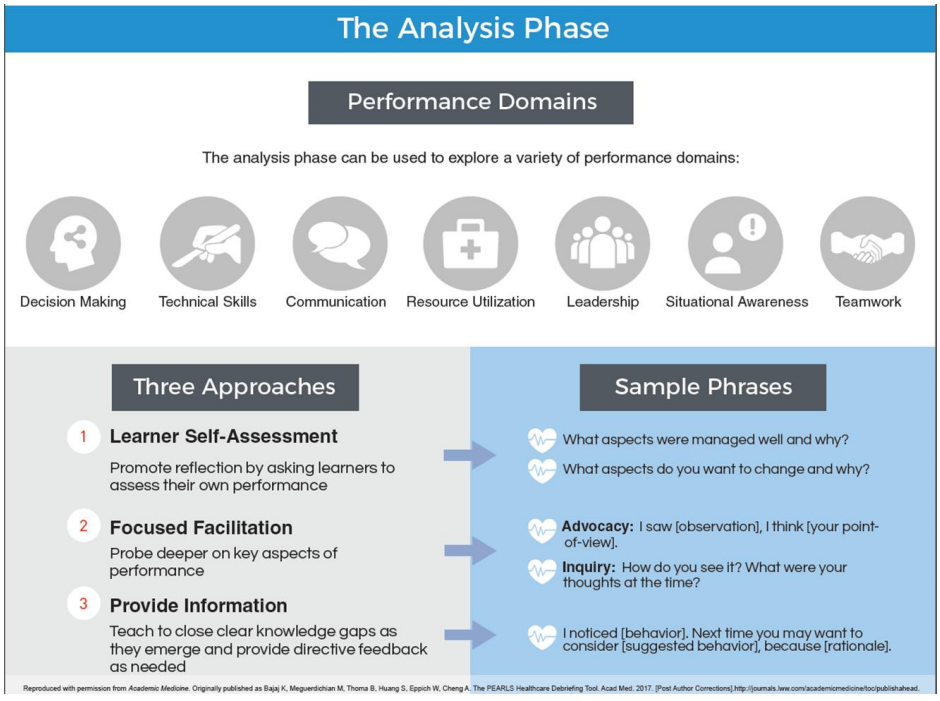
# Medical Debriefing

- Debriefing is usually done after a significant event
- Everyone involved should be invited to the debrief
- Allow staff to discuss their thoughts and emotions
- Counselors, social workers, and chaplains can be present to support staff

# Medical Debriefing

- Debriefing can be facilitated by a nursing supervisor, clinical coordinator, or physician
  - NOT a time to assign blame
  - Debriefing is a learning experience
  - NOT an individual counseling session
  - Describe the event and the response
  - ALL facts involving the situation should be discussed


The PEARLS Healthcare Debriefing Tool
Objective
Task
Sample Phrases
1 Setting the Scene
Create a safe context for learning
State the goal of debriefing; articulate the basic assumption*
"Let's spend X minutes debriefing. Our goal is to improve how we work together and care for our patients."
"Everyone here is intelligent and wants to improve."
2 Reactions
Explore feelings
Solicit initial reactions & emotions
"Any initial reactions?"
"How are you feeling?"
3 Description
Clarify facts
Develop shared understanding of case
"Can you please share a short summary of the case?"
"What was the working diagnosis? Does everyone agree?"
4 Analysis
Explore variety of performance domains
See backside of card for more details
Preview Statement
(Use to introduce new topic)
"At this point, I'd like to spend some time talking about [insert topic here] because [insert rationale here]"
Mini Summary
(Use to summarize discussion of one topic)
"That was great discussion. Are there any additional comments related to [insert performance gap here]?"
Any Outstanding Issues/Concerns?
5 Application/ Summary
Identify take-aways
Learner centered
"What are some take-aways from this discussion for our clinical practice?"
Instructor centered
"The key learning points for the case were [insert learning points here]."
*Basic assumption, Copyright © Center for Medical Simulation. Used with permission.
Reproduced with permission from Academic Medicine. Originally published as Bajaj K, Meguerdichian M, Thoma B, Huang S, Eppich W, Cheng A. The PEARLS Healthcare Debriefing Tool. Acad Med. 2017. [Post Author Corrections].http://journals.lww.com/academicmedicine/toc/publishahead.


The Analysis Phase
Performance Domains
The analysis phase can be used to explore a variety of performance domains:
Decision Making
Technical Skills
Communication
Resource Utilization
Leadership
Situational Awareness
Teamwork
Three Approaches
Sample Phrases
1 Learner Self-Assessment
Promote reflection by asking learners to assess their own performance
What aspects were managed well and why?
What aspects do you want to change and why?
2 Focused Facilitation
Probe deeper on key aspects of performance
Advocacy: I saw [observation], I think [your point-of-view].
Inquiry: How do you see it? What were your thoughts at the time?
3 Provide Information
Teach to close clear knowledge gaps as they emerge and provide directive feedback as needed
I noticed [behavior]. Next time you may want to consider [suggested behavior], because [rationale].
Reproduced with permission from Academic Medicine. Originally published as Bajaj K, Meguerdichian M, Thoma B, Huang S, Eppich W, Cheng A. The PEARLS Healthcare Debriefing Tool. Acad Med. 2017. [Post Author Corrections].http://journals.lww.com/academicmedicine/toc/publishahead.

PRISMA HEALTH | UNIVERSITY OF SOUTH CAROLINA School of Medicine

**CRM DEBRIEF OUTLINE & QUESTIONS**

**CRITICAL FAILURES, OMISSIONS & ADVERSE EVENTS:**
*What mistakes made it to the patient?*

1)

2)

3)

4)

5)

**POSITIVE/APPROPRIATE BEHAVIORS:**

1)

2)

3)

4)

5)

How well did the Team function together?

**CRM TOOLS & TECHNIQUES**

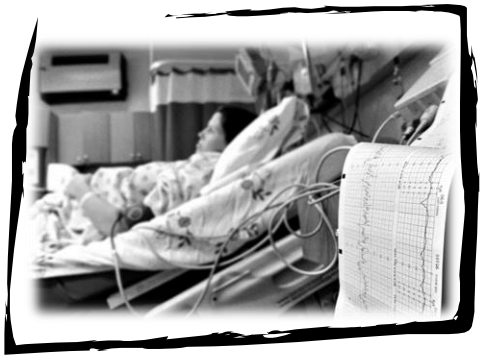
+ Team Leader sets collaborative tone.
+ Team Shell / Role Assignments
+ Role Discipline
+ Situation Briefing to Team
+ Contingency & Abort plans briefed
+ Shared Mental Model maintained
+ Checklists / Algorithms used
+ Clear Messages
+ Verbal Order Read-backs (before)
+ Closed Loops (after action)
+ Performance Monitoring / Two-Challenge Rule
+ Technical proficiency

If mistakes made it to the patient, ***why*** did they get that far?

Where/how could those mistakes have been trapped?

If this patient was your family member, would you be happy with this event?  Why or Why not?

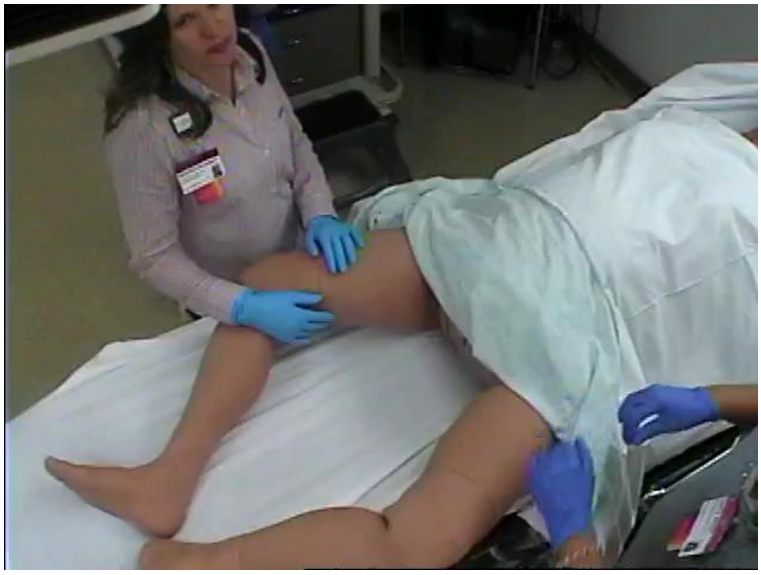
# Perinatal Case Scenario



Maternal Event

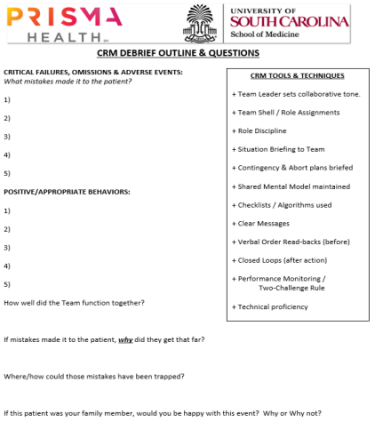
Neonatal Event

## Case Study Presentation - Maternal



# Debrief of Case

- Please utilize the form in your packet to complete the Debrief of the Maternal Video



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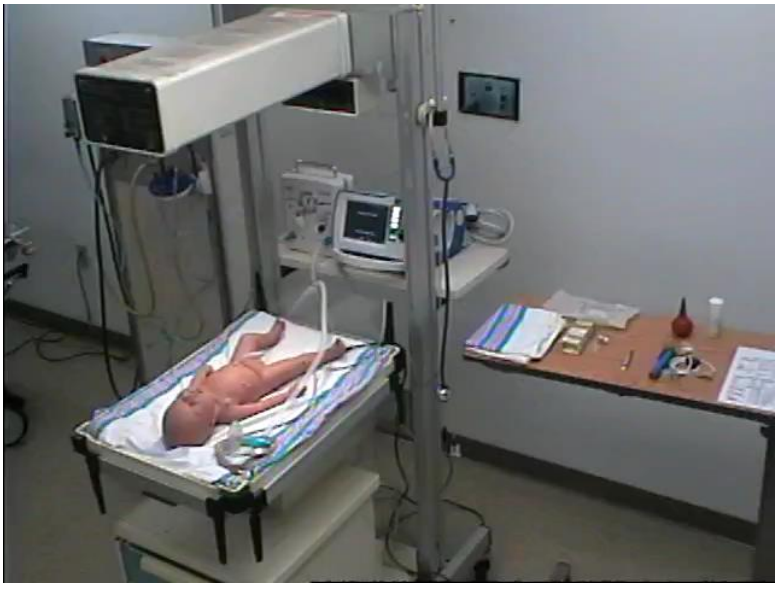
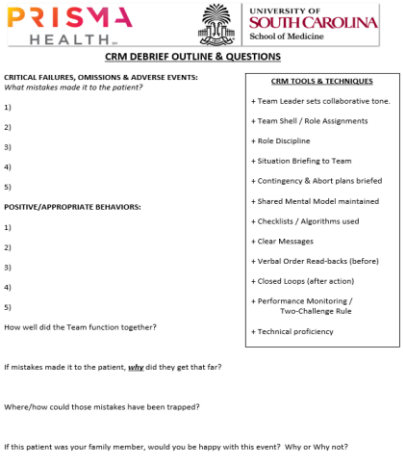
## Case Study Presentation - Neonatal



# Debrief of Case

- Please utilize the form in your packet to complete the Debrief of the Neonatal Video



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# More examples of Communication & Debriefs

- https://www.ahrq.gov/hai/tools/perinatal-care/modules/posthemorrhage-video.html
- https://www.ahrq.gov/hai/tools/perinatal-care/modules/strategies.html

Toolkit for Improving Perinatal Safety. Content last reviewed June 2017. Agency for Healthcare Research and Quality, Rockville, MD.
https://www.ahrq.gov/hai/tools/perinatal-care/index.html

# Thank you!

- Questions?
- Please complete your evaluation!

# References


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