Maternal and New Born Cardiac Arrest: The science and how GWTG-Resuscitation is addressing these unique patient populations

Presenters:
Carolyn M. Zelop, MD
Taylor Sawyer, DO, M.Ed
Christina Sterzing, RHIA– American Heart Association

March 16, 2018
12:00pm Central
STRIVE TO REVIVE:
DOUBLING SURVIVAL FOR IN & OUT-OF-HOSPITAL CARDIAC ARREST

AUGUST 2018
7:45AM - 4:15PM, REGISTRATION BEGINS AT 7:00AM
CURTIS BALLROOM AT THE LANDMARK
5345 LANDMARK PL.
GREENWOOD VILLAGE, CO 80111

For more info or to register:
Heart.org/strivetoreviveco

Featured Speakers

Comilla Sasson, M.D., PhD.
Veteran's Administration - Eastern Colorado & American Heart Association

Paul Chan, M.D., MSc
Professor of Medicine,
University of Missouri-Kansas City
Clinical Scholar,
Saint Luke's Mid America Heart Institute
Kansas City, MO

Sarah Perman, M.D., MSCE
Asst. Professor of Emergency Medicine,
University of Colorado School of Medicine
Denver, CO

Heather Wolfe, M.D., MSHP
Pediatric Critical Care Medicine
Philadelphia Children's Hospital
Philadelphia, PA

CME Credits
7.5 hours continuing education credit for physicians, mid-level practitioners, nurses, and emergency medical services

American Heart Association | American Stroke Association | Get With The Guidelines® Resuscitation
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Director of Ultrasound and Perinatal Research at Valley Hospital  
Clinical Professor of Ob/Gyn  
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Director, Neonatal Perinatal Fellowship Program  
Director of Medical Simulation  
Associate Professor

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MATERNAL AND NEW BORN CARDIAC ARREST: THE SCIENCE AND HOW GWTG-RESUSCITATION IS ADDRESSING THESE UNIQUE PATIENT POPULATIONS

Maternal Cardiac Arrest Registry

Carolyn M Zelop, MD
NO DISCLOSURES
GLOBAL AND U.S. MATERNAL MORTALITY

- Over the last 25 years, the global maternal mortality ratio (MMR) has decreased from 281.5 to 195.7
- MMR is defined as pregnancy-related deaths per 100,000 live births.
- However, despite the United Nations’ Millennium Development Goal for a 75% reduction in maternal mortality by 2015, from 1990-2015 the MMR of the US, has been increasing from 16.9 to 26.4 climbing more than 56%.


THE REASONS FOR RISING US MMR ARE QUITE COMPLEX

- Ascertainment bias from vital statistics
- Role of socioeconomic status, tremendous racial and ethnic disparities that may be linked to health care access, and unaddressed comorbidities that manifest as maternal complications
- Between 2006-2010, the U.S. pregnancy-related mortality ratio by year and race/ethnicity was 12 for Non-Hispanic White women compared to 38.9 for their Non-Hispanic Black counterparts
- Inadequate resuscitation science and translational perinatal resuscitation medicine

MATERNAL MORTALITY AND CARDIAC ARREST

• Prevalence of maternal cardiac arrest appears to be increasing

• Cardiovascular etiologies are becoming the most prevalent etiologies revealed by pregnancy mortality surveillance data

• 1/12,000 hospitalizations for delivery is complicated by cardiac arrest

• This data is important for the clinician in the trenches who is called to participate in the resuscitation of a mother in cardiac arrest. The stakes are very high because there are 2 patients and although still uncommon, maternal cardiac arrest may occur in any hospital.

Mhyre et al. Anesthesiology 2014
ACLS IN NONPREGNANCY

C - Circulation/Chest compressions
A - Airway
B - Breathing
D - Defibrillate
PREGNANT WOMEN ARE DIFFERENT

• Resuscitation maneuvers and interventions during maternal cardiopulmonary resuscitation must accommodate the physiological changes of pregnancy
  • Increase cardiac output by 40% to accommodate uterine-placental unit
  • Aortocaval compression as early as 20 weeks gestation
  • 20% increased oxygen consumption
  • Balanced acid/base status with respiratory alkalosis and metabolic acidosis
  • Decreased GI sphincter tone leading to increased aspiration risk especially with loss of consciousness
ILCOR 2015, AHA 2015 and First scientific statement of maternal cardiac arrest from AHA 2015 recommend:

- Left lateral uterine displacement to relieve aortocaval compression of the enlarging uterus that is greater than or equal to 20 weeks.
- Perimortem delivery when ROSC is unsuccessful during maternal code blue when the uterine size is greater than or equal to 20 weeks.
- All three publications underscored the low GRADE of evidence and the need to bridge the gaps in maternal resuscitation science.
- New GWTG maternal and linked fetal/neonatal variables will provide more robust data.
ACLS
IN PREGNANCY

C - Circulation/Chest compressions
A - Airway
B - Breathing
D - Defibrillate
E - Extract fetus
Chest Compressions

Airway/Breathing

LUD

Circulation
BLS and ACLS in Pregnancy

MCA
No pulse
No respirations

Call for help

Start Immediate Chest Compressions
Perform LUD
Bag Mask Ventilation; Intubation if highly skilled provider available

Place defibrillator
Remove FHR monitor

Analyze Rhythm

VF
pVT
Immediate defibrillation. If persistent after 1 shock, start epinephrine 1 mg IV/IO every 3-5 minutes. If no pulse after 2 shocks and epinephrine, administer 300 mg of amiodarone IV/IO

PEA
Asystole
Epinephrine 1 mg IV/IO every 3-5 minutes

If no resuscitation after 4 mins, start PMD

Assess GA

Adapted from AHA and AJOG MCA review 2018
Characteristics and Outcomes of Maternal Cardiac Arrest

C M Zelop, MD 1,2; S Einav, MD 3; J M Hyrde, MD 4; S Lipman, MD 5; J Arafah RN, MS 5; R E Shaw, Ph.D 1; P D Edelson, MD 6; F M Jeejeebhoy 7

(1) The Valley Hospital, Ridgewood, N.J; (2) New York University School of Medicine, New York, NY; (3) Sharee Zedek Medical Center Jerusalem, Israel; (4) University of Arkansas Medical Sciences; (5) Stanford University; (6) University of Chicago; (7) University of Toronto William Osler HS

Background: Maternal Mortality in the United States has reached unprecedented heights since the new millennium. The maternal mortality rate (MMR) defined as the number of pregnancy-related maternal deaths per 100,000 live births has risen from 16.8% (95% confidence interval [CI] 15.6-17.1) in 1990 to 25.6% (24.4-26.8) in 2015 (Global, regional, and national levels of maternal mortality, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015, Lancet 2016; 388:1795-812.) Maternal cardiac arrest (MCA) represents a final common pathway for a variety of maternal pathophysiological insults. Despite the importance of MCA in characterizing maternal mortality and morbidity, large cohort studies detailing MCA remain limited.

Objective: We sought to further describe contemporary characteristics and outcomes of in-hospital MCA.

Study Design: We queried the American Heart Association’s Get with the Guidelines Resuscitation registry from 2000-2016 to identify cases of MCA. We included all index cardiac arrests occurring in women aged 18-50 with a patient illness category designated as obstetric or location of arrest occurring in a delivery suite. Institutional review deemed this research exempt from ethical approval.

Results: A total of 462 index events met criteria for MCA, with a mean age of 31.7 years and a racial distribution of: 49.4% White, 32.7% Black, and 13.3% Other/Unknown. White 23% had no pre-existing conditions; 36.1% had respiratory insufficiency; 36.3% had hypertension/hypertensive; 12.8% had diabetes, 9.1% had renal insufficiency; 6.4% had acute CNS non-ventilatory events and 5.4% had cardiac disease. The index event was witnessed in 93.7% and a hospital-wide resuscitation response was activated in 77.5% of events. In most cases, the first documented pulseless rhythm was non-shockable; pulseless electrical activity (PEA) or asystole (28.8%). Only 11.7% presented with shockable rhythms (74/91= 81%). The observed rate of defibrillation was similar with shockable rhythms (42/51= 82%) and those with non-shockable rhythms (71/83= 86%). The observed rate of ventilatory support was high (95.4%) with endotracheal intubation utilized in (416/462) (90.0%) of MCA cases. Epinephrine was administered in 86.8% of the cases. The medications utilized for resuscitation in the cohort are reported in Table 2. Outcomes for the cohort of women sustaining MCA were also analyzed. Return of spontaneous circulation occurred in 460 (79.3%) women but 68 (14.7%) had more than one arrest. Overall 158 women (40.7%) survived to hospital discharge. The rates of survival to hospital discharge, according to initial pulseless rhythm were: 37.3% with non-shockable rhythms, 33% with shockable rhythms and 64.3% with unknown presenting rhythms.

Conclusions: Maternal survival at hospital discharge in this cohort is less than 50%, lower than rates reported in other epidemiological datasets. More research is required in maternal resuscitation science and translational medicine to continue to improve outcomes and understand maternal mortality. These data support the need for a mandatory national database for MCA.

Table II Medications Used for MCA

<table>
<thead>
<tr>
<th>Medications</th>
<th>Numbers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine</td>
<td>416 (90.0%)</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>102 (22.1%)</td>
</tr>
<tr>
<td>Atropine</td>
<td>21 (4.5%)</td>
</tr>
<tr>
<td>Magnesium</td>
<td>11 (2.3%)</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Rosuvastatin</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Vasopressin</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Steroids</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Labetalol</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Nitroglycerine</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Naloxone</td>
<td>1 (0.2%)</td>
</tr>
</tbody>
</table>

Discussion: In the cohort of 462 cases of MCA, survival and hospital discharge was 40.7%. The high rates of resuscitation efficacy reflect the current AHA guidelines for maternal resuscitation that recommend current chest compressions, less chest decompression during CPR greater than three or even seven weeks gestation along with ventilation and oxygenation.

Cases of MCA in this cohort receive a predominate (76.4%) of non-shockable first documented pulseless rhythms: pulseless electrical activity (PEA) or asystole (28.8%). Although “etiology” of MCA was not captured in this dataset, these maternal cardiac rhythms coincide with well described causes of cardiac arrest such as hypovolemia (hemorrhage), hypoxia, arrhythmia, hypokalemia, hypothermia, toxins (magnesium sulfate, opioids), thrombosis (pulmonary or coronary), hypotension and less pre-existing conditions.

Figure 1

Table I Demographic Information and Pre-existing Conditions of Women with MCA

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Numbers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Age (years)</td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>158 (34.2%)</td>
</tr>
<tr>
<td>30-39</td>
<td>144 (31.2%)</td>
</tr>
<tr>
<td>40-49</td>
<td>160 (34.6%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>224 (48.4%)</td>
</tr>
<tr>
<td>Black</td>
<td>119 (25.8%)</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>120 (25.8%)</td>
</tr>
<tr>
<td>Pre-existing Conditions</td>
<td></td>
</tr>
<tr>
<td>Hypertension/hypertensive</td>
<td>161 (34.8%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>36 (7.8%)</td>
</tr>
<tr>
<td>Renal Insufficiency</td>
<td>18 (3.9%)</td>
</tr>
<tr>
<td>Respiratory insufficiency</td>
<td>49 (10.6%)</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>62 (13.4%)</td>
</tr>
</tbody>
</table>

Conclusion: Maternal survival to hospital discharge was 41%, lower than rates of survival reported in other data sets focusing on maternal CPR. More research is required in maternal resuscitation science and translational medicine to produce data with sufficient granularity to improve MCA outcomes and understand maternal mortality. These data support the need for a mandatory national database for MCA that will provide framework for ultimately increase survival and quality of life of our mothers.
WHY SHOULD HOSPITALS PARTICIPATE AND ENTER NEW DATA ELEMENTS FOR MATERNAL CARDIAC ARREST?

• Improve our understanding of maternal resuscitation science
• Enhance our knowledge of optimal chest compressions and maneuvers to relieve aortocaval compression
• Provide further incite into optimal airway management during maternal cardiac arrest
• Guide further recommendations regarding the gestational age and timing of perimortem delivery
UPDATED GWTG WITH PREGNANCY SPECIFIC VARIABLES
PMT Updates Summary

• 9 new data elements added to the CPA form to support research have been added to “Research” tab
• No measures were affected by the updates
• CRF and coding instructions have been updated to reflect updates
• Uploader documents have been updated to include the new data elements
CPA Pre-existing conditions: Recently delivered or currently pregnant

New response option for pre-existing conditions: recently delivered or currently pregnant.

Selecting this option will trigger the new data elements on the Research tab.
Research Tab: Maternal In-Hospital Cardiac Arrest

Select either recently delivered and delivery date OR currently pregnant and due date.

Indicate number of fetuses during this episode of care.

Gestational age is an auto-calculated field.
Pregnancy or delivery complications

Indicate all of the documented delivery and pregnancy complications

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Documented</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Alcohol use</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
</tr>
<tr>
<td>Cocaine/Crack use</td>
</tr>
<tr>
<td>Gestational Diabetes</td>
</tr>
<tr>
<td>Diabetes</td>
</tr>
<tr>
<td>Eclampsia</td>
</tr>
<tr>
<td>GHTN (Pregnancy induced/gestational hypertension)</td>
</tr>
<tr>
<td>Hypertensive Disease</td>
</tr>
<tr>
<td>Magnesium exposure</td>
</tr>
<tr>
<td>Major trauma</td>
</tr>
<tr>
<td>Maternal Group B Strep (Positive)</td>
</tr>
<tr>
<td>Maternal infection</td>
</tr>
<tr>
<td>Methamphetamine/ICE use</td>
</tr>
<tr>
<td>Narcotic given to mother within 4 hours of delivery</td>
</tr>
<tr>
<td>Narcotics addiction and/or on methadone maintenance</td>
</tr>
<tr>
<td>Obstetrical hemorrhage</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
</tr>
<tr>
<td>Prior Cesarean</td>
</tr>
<tr>
<td>Urinary Tract Infection (UTI)</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

(specify)
Gravida and Parity History

Enter total number of pregnancies

Enter total number of deliveries
If patient has delivered recently, please select the delivery mode here.
Left Lateral Uterine Displacement Information

Because of maternal physiologic changes, left lateral uterine displacement is required during cardiopulmonary resuscitation. This is performed by tilting the whole maternal body **25 to 30 degrees (Figure 215)**, or by manual uterine displacement (Figure 315).

Select yes or no

If yes, enter date/time recognized and the method
Neonatal/newborn information

Select if the neonate was delivered or undelivered; if delivered enter the 1 and 5 minute Apgar scores; if undelivered, select either IUFD or viable (meaning, the patient is still pregnant and baby is alive).

Also indicate if there is a CPA event for the newborn (select yes if the neonatal outcome=delivered and there is a CPA form for the newborn); if the fetus is undelivered or there wasn’t a CPA event for the newborn, select “no”.
Newly Born Cardiac Arrest: How GWTG Resuscitation is Addressing this Unique Patient Population

Taylor Sawyer, DO, MEd
Director, Neonatal-Perinatal Medicine Fellowship
Associate Division Head for Education
Division of Neonatal-Perinatal Medicine
University of Washington School of Medicine | Seattle Children’s Hospital
Disclosure

- Neither I nor any member of my immediate family has a financial relationship or interest with any proprietary entity producing health care good or services related to the content of this CME activity
- My content will not include discussion/reference of any commercial products or services
- I do not intend to discuss an unapproved/investigative use of commercial products/devices
Learning objectives

- Review terminology use to describe patients in the first days to weeks of life
- Identify differences in the resuscitation practice between the newly born and neonate/infant
- Explain AHA GWTG-R quality metrics for the newly born
Clinical Scenario 1

• Resuscitation team is called to attend the cesarean section delivery of a 28 week gestation newborn
• Prenatal history is unremarkable
• Late decelerations on fetal monitor
• Baby born apneic and cyanotic, with heart rate of 40 bpm
Clinical Scenario 2

• NICU team called to evaluate a former 28 week gestation baby, now 2 months old
  – 36 weeks post-menstrual age

• History significant for respiratory distress syndrome, symptomatic patent ductus arteriosus, and severe bronchopulmonary dysplasia
  – Baby still on ventilator

• Team arrives to find baby apneic and cyanotic, with heart rate of 40 bpm
Clinical Scenario 3

- Emergency Room team called to evaluate a former 28 week gestation baby, now 2 months old
  - 36 weeks post-menstrual age
- History significant for unremarkable 6 week stay in the NICU
  - Discharged home 2 weeks ago
- Baby found apneic and lifeless at home in crib
- Team arrives to find baby apneic and cyanotic, with heart rate of 40 bpm
Clinical Scenario Questions?

What resuscitation guideline should be used in each of the three scenarios?

- Neonatal vs. Pediatric

How do you define high quality resuscitation in each case?
Terminology
Terminology

“Newly born” - a baby undergoing transition from intrauterine to extrauterine life


Terminology

“Newborn” - a baby during their initial hospitalization in the newborn nursery or neonatal intensive care unit (NICU)


http://fox2now.com/2017/02/11/these-tiny-diapers-fit-babies-less-than-2-pounds/
Terminology

“Neonate” – a baby who has completed perinatal transition and is ≤ 28 days of life

https://www.therecoveryvillage.com/drug-rehab/28-30-day-rehab-programs/
Terminology

‘Infant’ - a baby between 28 days and one year of age

Terminology

According to Neonatal Resuscitation Guidelines:

“Newborn” and “neonate” apply to any infant during the initial hospitalization

“Newly born” is intended to apply specifically to an infant at the time of birth

Terminology

According to the American Heart Association GWTG-R:

Neonate/Infant = ≥ 24 hours old with age <1 year

Newly born = < 24 hours old

*during perinatal transition period*
Resuscitation of the newly born
Neonatal Algorithm
Neonatal Algorithm—“Golden Minute”

1. Antenatal counseling
   Team briefing and equipment check

2. Birth
   - Term gestation?
     - Good tone?
       - Breathing or crying?
       - Yes
     - No
       - Warm and maintain normal temperature, position airway, clear secretions if needed, dry, stimulate

3. Infant stays with mother for routine care: warm and maintain normal temperature, position airway, clear secretions if needed, dry, stimulate
   Ongoing evaluation

4. Apnea or gasping?
   - HR below 100/min?
     - Yes
       - PPV
       - SpO2 monitor
       - Consider EOG monitor
     - No
     - Labored breathing or persistent cyanosis?
       - Yes
       - Position and clear airway
       - SpO2 monitor
       - Supplementary O2 as needed
       - Consider CPAP
     - No
       - No
**Neonatal Algorithm – After 1st minute**

- **HR between 60-100**
  - HR below 100/min?
    - Yes: Check chest movement, ventilation corrective steps if needed, ETT or laryngeal mask if needed
    - No: Postresuscitation care, Team debriefing
  - HR below 60/min?
    - Yes: Intubate if not already done, Chest compressions, Coordinate with PPV, 100% O₂, ECG monitor, Consider emergency UVC
      - HR below 60/min?
        - Yes: IV epinephrine, If HR persistently below 60/min, Consider hypovolemia, Consider pneumothorax
        - No: Postresuscitation care, Team debriefing
Neonatal Resuscitation - Takeaways

• Primary focus = ventilation
  – A → B → C

• Chest compressions indicated if HR < 60 bpm, despite 30 seconds of effective ventilation

• Intubate before starting chest compressions
When to use Neonatal and Pediatric Guidelines?
Neonatal Resuscitation Guidelines

Should be used for:

• “newly born infants undergoing transition from intrauterine to extraterine life… also applicable to *neonates* who have completed perinatal transition and require resuscitation during the first few weeks to months following birth.”

• “Newborns who require CPR in the newborn nursery or NICU receive CPR using the same technique as for the newly born in the delivery room.”

Pediatric Resuscitation Guidelines

Should be used for:

• “Newborns who require CPR in other settings (eg, prehospital, ED, PICU, etc.), should receive CPR according to infant [e.g. pediatric] guidelines.”

• “It is reasonable to resuscitate newborns with a primary cardiac etiology of arrest, regardless of location, according to infant guidelines, with emphasis on chest compressions.”

Time to use PALS, rather than NRP

Sawyer T, et al. Infant resuscitation outside the delivery room. NRP or PALS: Results of a national survey. JNPM. 2009
Time to use PALS, rather than NRP

AHA GWTG-R Quality Measures for the Newly Born
## 2017 CPA Quality Measures

### Cardiopulmonary Arrest

#### Adult

- **Age**: >18 years
- **Event**: Confirmation of airway device placement in trachea: Percent of events who had confirmation of airway device placement in trachea.
- **Time to First Shock**: ≤2 min for VF/pulseless VT first documented rhythm: Percent of event with VF/pulseless VT first documented rhythm in whom time to first shock ≤2 minutes of event recognition.
- **Time to IV/IO Epinephrine ≤5 minutes for asystole or pulseless electrical activity (PEA)**: Percent of events when time to epinephrine ≤5 minutes of asystole or pulseless electrical activity.
- **Percent pulseless cardiac events monitored or witnessed**: Percent of pulseless cardiac patient setting: events were monitored or witnessed.

#### Pediatric

- **Age**: ≤18 years and >1 year
- **Event**: Confirmation of airway device placement in trachea: Percent of events who had confirmation of airway device placement in trachea.
- **Time to First Shock**: ≤2 min for VF/pulseless VT first documented rhythm: Percent of events with VF/pulseless VT first documented rhythm in whom time to first shock ≤2 minutes of event recognition.
- **Time to IV/IO Epinephrine ≤5 minutes for asystole or pulseless electrical activity (PEA)**: Percent of events when time to epinephrine ≤5 minutes of asystole or pulseless electrical activity.
- **Percent pulseless cardiac events occurring in an ICU setting**: Percent of pulseless cardiac events occurring in an ICU setting (Adult ICU, PICU, Pediatric Cardiac ICU, Neonatal ICU) versus a general inpatient area (General inpatient area, Step down telemetry, Newborn Nursery).

#### Neonate/Infant

- **Age**: ≤1 year and ≥24 hours old
- **Event**: Confirmation of airway device placement in trachea: Percent of events who had confirmation of airway device placement in trachea.
- **Time to First Shock**: ≤2 min for VF/pulseless VT first documented rhythm: Percent of events with VF/pulseless VT first documented rhythm in whom time to first shock ≤2 minutes of event recognition.
- **Time to IV/IO Epinephrine ≤5 minutes for asystole or pulseless electrical activity (PEA)**: Percent of events when time to epinephrine ≤5 minutes of asystole or pulseless electrical activity.
- **Percent pulseless cardiac events occurring in an ICU setting**: Percent of pulseless cardiac events occurring in an ICU setting (Adult ICU, PICU, Pediatric Cardiac ICU, Neonatal ICU) versus a general inpatient area (General inpatient area, Step down telemetry, Newborn Nursery).

#### Newly Born

- **Event**: Occurred at delivery (<24 hours old).
- **Advanced airway placed prior to the initiation of chest compressions**: Percent of events who had an advanced airway (either laryngeal mask airway (LMA) or endotracheal tube (ET) or tracheostomy tube) placed prior to initiation of chest compressions.
- **Pulse oximetry in place prior to the initiation of chest compressions**: Percent of events where pulse oximetry was in place prior to the initiation of chest compressions.
- **Time to positive pressure ventilation ≤1 minute from CPA recognition**: Percent of events where the positive pressure ventilation was within 1 minute of event recognition.

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http://www.heart.org/idc/groups/heart-public/@private/@wcml/@hcm/@gwtg/documents/downloadable/ucm_434082.pdf
2017 Newly Born CPA Quality Measures

| Time to positive pressure ventilation <1 minute from CPA recognition: Percent of events where the positive pressure ventilation was within 1 minute of event recognition. |
| Pulse oximetry in place prior to the initiation of chest compressions: Percent of events where pulse oximetry was in place prior to the initiation of chest compressions |
| Advanced airway placed prior to the initiation of chest compressions: Percent of events who had an advanced airway (either laryngeal mask airway (LMA), endotracheal tube (ET) or tracheostomy tube) placed prior to initiation of chest compressions. |
| Confirmation of airway device placement in trachea: Percent of events who had confirmation of airway device placement in trachea. |

http://www.heart.org/loc/groups/heart-public/@private/@wcm/@bcm/@gwg/documents/downloadable/ucm_434082.pdf
Time to positive pressure ventilation < 1 minute from cardiopulmonary arrest recognition

- “Approximately 60 seconds ("the Golden Minute") are allotted for completing the initial steps, reevaluating, and beginning ventilation if required”

Pulse oximetry in place prior to the initiation of chest compressions

- Pulse oximetry recommended since 2010
  - Still not universal
- 2015 neonatal resuscitation guidelines recommend placement of a pulse oximeter if PPV required
- PPV precedes chest compressions
Advanced airway placed prior to the initiation of chest compressions

- The focus of newly born resuscitation is *ventilation*
- 2015 neonatal resuscitation guidelines recommend intubation, prior to the start of chest compression.
Confirmation of airway device placement in trachea

• Same metric as neonate/infant, pediatric, and adult

• Guidelines recommend that providers always use both clinical assessment and devices to confirm endotracheal tube location immediately after placement and throughout the resuscitation.

Conclusion

• Terminology use to describe patients in the first days to weeks of life may be confusing
  – “Newly born” = at the time of birth

• Resuscitation of the newly born focuses on ventilation

• AHA GWTG-R quality metrics for the newly born are unique, and are based on neonatal resuscitation guidelines
THANK YOU!

• To the American Heart Association for recognizing the unique resuscitation needs of the newly born!

Acknowledgment

GWTG-R Pediatric, Neonate/Infant, and Newly Born Recognition Measures Work Group

- Alexis Topjian MD
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- Elizabeth Foglia MD, MSCE
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Denver, CO
April 12, 2018
For more info or to register:
Heart.org/strivetoreviveco

Featured Speakers

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Veteran's Administration - Eastern Colorado & American Heart Association

Paul Chan, M.D., MSc
Professor of Medicine, University of Missouri-Kansas City Clinical Scholar, Saint Luke's Mid America Heart Institute Kansas City, MO

Sarah Perman, M.D., MSCE
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Heather Wolfe, M.D., MSHP
Pediatric Critical Care Medicine Philadelphia Children's Hospital Philadelphia, PA

CME Credits
7.5 hours continuing education credit for physicians, mid-level practitioners, nurses, and emergency medical services
Thank you for your active participation and contributions to GWTG-Resuscitation!