Neonatal Resuscitation Program

Provides guidelines for resuscitation

Algorithm for team to follow

What is NRP

- Neonatal Resuscitation Program
- Provides guidelines for resuscitation
- Algorithm for team to follow

NRP: Lessons

- Lesson 1: Foundations of Neonatal Resuscitation
- Lesson 2: Preparing for Resuscitation
- Lesson 3: Initial Steps of Resuscitation
- Lesson 4: Positive-Pressure Ventilation
- Lesson 5: Alternative Airways
- Lesson 6: Chest Compressions
- Lesson 7: Medications
- Lesson 8: Post-resuscitation care
- Lesson 9: Resuscitation and Stabilization of Babies Born Preterm
- Lesson 10: Special Considerations
- Lesson 11: Ethics and Care at the End of Life
Why is it important?

- ~10% of all babies need some resuscitation at delivery
- <1% of babies will need extensive resuscitation
- Lack of resuscitation or poor resuscitation can lead to long term complications and death

Why do newborns need resuscitation?

- Most newborns have a healthy heart
- Prior to birth: placenta respiratory function may fail
- After birth: baby fails to initiate or cannot maintain effective gas exchange

PRIMARY PROBLEM?
- Inadequate gas exchange

Treatment?
- Ventilation of baby’s lungs

Babies at Risk: Antepartum

- Gestational age < 36.0 wks
- Gestational age ≥ 41 wks
- Preeclampsia/Eclampsia
- Maternal hypertension
- Multiple gestation
- Fetal anemia
- polyhydramnios
- Oligohydramnios
- Fetal hydrops
- Fetal Macrosomia
- Intrauterine growth restrictions
- Significant fetal malformations or congenital anomalies
- No prenatal Care
Babies at Risk: Intrapartum

- Emergency C/S
- Forceps/vacuum delivery
- Breech/abnormal present.
- Category II or III FHR pattern
- Maternal general anesthesia
- Maternal magnesium therapy
- Placental abruption
- Intrapartum bleeding
- Chorioamnionitis
- Narcotics admin to mother ≤ 4 hrs of delivery
- Shoulder dystocia
- Meconium-stained amniotic fluid
- Prolapsed umbilical cord

ALWAYS BE PREPARED!!

- ANY BABY can end up needing resuscitation!
  - No risk factors!
  - Category 1 fetal monitoring strip!
  - Uncomplicated delivery!
  - https://youtu.be/tJ34R2LbkBE

NRP 7th edition unprepared and unorganized - YouTube

Team Work and Communication

- Can be the difference between a good outcome and a poor outcome
- Pre-resuscitation Briefing
- Important tools for Teamwork
  - Leadership and delegation
  - Efficient and effective communication
  - Coordination of effort
  - Professional behavior
Prepare your Environment

- Check your supplies
- Prepare equipment prior to delivery
- Check your equipment for functionality

Determining Need for Resuscitation

- Was the baby born at term?
  - Respiratory issues
  - Temperature regulation issues
- Is the baby breathing or crying?
  - Gasp =
  - Apnea =
- Is there good muscle tone?
  - Sick or preterm babies will have decreased tone

APGARS

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Blue or Pale</td>
<td>Acrocyanotic</td>
<td>Completely Pink</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>Absent</td>
<td>&lt;100</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Reflex Irritability</td>
<td>No Response</td>
<td>Grimace</td>
<td>Cry or Active Withdrawal</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>Limp</td>
<td>Some Flexion</td>
<td>Active Motion</td>
</tr>
<tr>
<td>Respiration</td>
<td>Absent</td>
<td>Weak Cry, Hypoventilation</td>
<td>Good, Crying</td>
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</table>
**ABCD’s: The Basics**

- Airway
- Breathing
- Circulation
- Drugs

**Initial Steps**

- Provide Warmth
- Position, clear airway as appropriate
- Dry, stimulate, reposition

[NRP 6th ed initial steps - YouTube](#)
Positive Pressure Ventilation

- Bag/Mask
- T-Piece Resuscitator
- Effective ventilations =
- Pulse oximetry used when PPV or supplemental oxygen is used, or cyanosis is present
  
  https://youtu.be/XaQqkvY1xuc

MR SOPA

- M-mask adjustment
- R-reposition airway
  
  Recheck ventilation
- S-suction mouth and nose
- O-open mouth
  
  Recheck ventilation
- P-increase pressure
  
  Recheck ventilation
- A-alternate airway
  
  Recheck ventilation

Targeted Preductal SpO2 After Birth

<table>
<thead>
<tr>
<th>Time</th>
<th>Target SpO2</th>
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<tbody>
<tr>
<td>1 minute</td>
<td>60-65%</td>
</tr>
<tr>
<td>2 minutes</td>
<td>65-70%</td>
</tr>
<tr>
<td>3 minutes</td>
<td>70-75%</td>
</tr>
<tr>
<td>4 minutes</td>
<td>75-80%</td>
</tr>
<tr>
<td>5 minutes</td>
<td>80-85%</td>
</tr>
<tr>
<td>10 minutes</td>
<td>85-95%</td>
</tr>
</tbody>
</table>

Term Infant:
*PPV at 21% oxygen increase/decrease at small increments to remain within the targeted SpO2
*Initiate flow by at 25-30% and increase/decrease at small increments to remain within the targeted SpO2 above

Preterm Infant:
*PPV at 21% or slightly higher depending on gestational age and clinical situation surrounding birth and increase/decrease at small increments to remain within targeted SpO2 above

***If doing chest compressions, oxygen should be at 100% ***
- Endotracheal tube (ETT)

- Laryngeal Mask Airway (LMA)

**Chest Compressions**

- Effective ventilations using PPV administered for at least 30 seconds prior to starting compressions
- Do compressions for 60 seconds and re-evaluate

- Ideally with an alternative airway
  - If they don’t have one, one is placed prior to chest compressions

  - [NRP 7th edition chest compressions - YouTube](#)
What happens next?

- Epinephrine
- Umbilical vein catheter
- Volume replacement when appropriate

Let’s Put It Together

- NRP 7th edition Putting it all together - YouTube

Post-Resuscitation Care

- May be able to receive routine care
- May need to be transferred to transition nsy/Level II nsy/NICU
  - Cardiorespiratory monitoring
  - Blood sugars
  - Frequent vital signs
  - Temperature maintenance
  - Ongoing support with oxygen