Basic Principles of Newborn Assessment

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Objectives

• At the end of the module, the participant will be able to:
  1. Identify the basic principles of newborn/neonatal assessment with or without technology for a potentially sick or preterm infant.
  2. Recognize the importance of the first few minutes, hours, and days of life.
  3. Identify risk factors for potential illness or complications.
Importance of Assessment

• Proper assessment leads to the early identification of actual or potential problems.
• Early identification of potential risk factors guides priority setting for the continued assessment and care.
  • In turn this leads to better treatment and potentially a better outcome.
• It is a continuous process.
Three Periods Critical to Assessment

- First Few Minutes of Life
- First Few Hours of Life
- First Days and Weeks of Life
I. First Few Minutes

Assess Infant Status:
• Color
• Activity
• Breathing Effort
• Heart Rate
• Muscle tone

Define Priorities!

*Maternal Status: Are there any known risk factors? What type delivery or complications? These are good things to know but you may not.
At Delivery

• Apgar Score
  • Is one tool that is used to determine the newborn status
  • Standardized score
# Apgar Score

<table>
<thead>
<tr>
<th>Parameter or Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Pale or Blue</td>
<td>Acrocyanosis (blue hands and feet)</td>
<td>Completely Pink</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>Absent</td>
<td>Below 100 beats/minute</td>
<td>Over 100 beats/minute</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>Absent</td>
<td>Weak Cry</td>
<td>Strong Cry</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>Limp</td>
<td>Some Flexion</td>
<td>Active Motion</td>
</tr>
<tr>
<td>Reflex Irritability</td>
<td>No response</td>
<td>Grimace</td>
<td>Cry; Withdraws from attempt to move</td>
</tr>
<tr>
<td>Total Score</td>
<td>1 minute</td>
<td>5 minutes</td>
<td>10 minutes</td>
</tr>
</tbody>
</table>
Apgar Score

- Is a method of determining the status of the infant
- It examines the infant’s color, posture, respirations, pulse by assigning scores at 1, 5, and 10 minutes of age.
- If this score is greater than 7 the infant is responding well to extrauterine life
- If this score is less than 7 then continue scoring for the first 20 minutes of life. Resuscitation may be necessary but Apgar Score should not be the only determining factor.
First Few Minutes

• Normal Vital Signs
  o Heart rate: 120-160 beats per minute
  o Respiratory rate: 30-60 breaths per minute
First Few Minutes

- Blood Pressure will depend on gestational age/weight
- If you have no way to measure blood pressure; feel pulse and check capillary refill time (normal is less than 3 seconds).
- If you feel a radial pulse blood pressure is probably good; if you feel a brachial pulse it is at least 70 mmHg systolic in term. This measurement may be delayed beyond first few minutes.
First Few Minutes

• Blood pressure norms by weight:
  o 1001-1500 grams 49-56 mmHg (average) systolic; 26-33 mmHg diastolic
  o 1501-2000 grams 46-61 mmHg (average) systolic; 23-35 mmHg diastolic
First Few Minutes

• Blood pressure norms:
• Weight:
  o For term infant over 2000 grams:
  • 50-70 mmHg systolic
  • 25-40 mmHg diastolic
• Mean pressure-difference between systolic and diastolic should be 25-35 mmHg (term) and 15-25 mmHg (preterm)
Neonatal Resuscitation

- If there is a low heart rate or respiratory rate, the infant may need resuscitation.
- Have help from a nurse or an attendant who can assist with resuscitation (assisting with breathing or circulation).
- Specific knowledge and training is required to perform effective stabilization and resuscitation.
Neonatal Resuscitation & Stabilization Resources

- Neonatal Resuscitation Program (NRP) From the American Academy of Pediatrics-used worldwide
  - [www.aap.org/NRP/](http://www.aap.org/NRP/)
- Helping Babies Breath (HBB)
  - [www.helpingbabiesbreathe.org](http://www.helpingbabiesbreathe.org)
II. First Few Hours

- Assessment is still very important
- First minutes can be deceptive
- Watch the baby
- Head to toe assessment can be done if stable
- If not stable then the baby cannot tolerate a full head to toe assessment; focus on the system that is the most important—always consider the airway and circulation as top concerns
First Few Hours

• The first 6-12 hours of life is the time when the baby transitions from the uterus to extrauterine life
• In utero the fetal lungs are filled with fluid. Blood circulates from the placenta and the lungs are not used to breathe. At birth if the baby is born vaginally the fetal-infant chest is compressed and the fluid squeezed out. The baby cries taking the first—the hardest breath to push air into the lungs and open up the very smallest of the lung sacs. The air replaces and pushes fluid out. If the baby is born via cesarean section, the lungs remain filled with fluid until the infant begins to breathe and pushes the fluid out—the baby may breathe very rapidly—transient tachypnea.
First Few Hours

• The fetal circulatory shunts close.
  • Three fetal shunts:
    o Foramen Ovale-opening between the two upper chambers of the heart (allows blood to bypass the lungs)
    o Ductus Arteriosus-opening between the aorta and pulmonary artery
    o Ductus Venosus-connection between the inferior vena cava and umbilical vein

• When the umbilical cord is cut; the placenta is lost and the infant’s circulatory system takes over.
First Few Hours: Thermoregulation

• Keep in mind that a baby when born leaves a wet, warm environment—in the uterus and enters a cold one with blowing air. The fetal temperature is just slightly higher than the mother’s.

• The baby loses heat:
  • By conduction—touching a surface of another object like a bed;
  • By convection—related to air movement;
  • By radiation—heat lost to the environment
  • By evaporation—heat lost from water leaving the body
First Few Hours

• If there is access to equipment, draw blood to check glucose, electrolytes, hematocrit, hemoglobin, and bilirubin levels
• Check the blood pressure
• If not possible to use equipment, there are ways to determine blood pressure: capillary refill time, skin and mucous membrane-moisture and color.
  • The viscosity of the blood if any is drawn
  • Sounds when breathing, is there any nasal flaring, retractions, grunting
First Few Hours

• Continue to watch the breathing patterns to determine the amount of effort the baby exerts
• Observe the activity pattern
  • Muscle tone-resistance to movements, position of arms, legs, neck, etc.
• Observe for abnormalities
• Assess gestational age, length, and weight, and reflexes.
Gestational Assessment

- There are several instruments that can be used.
- Ballard Scale is very common-useful for preterm and term infants
- Gestational Assessment Scale - Physical and Neurological maturation. One example of a very good video is the New Ballard Score video done by Dr. Jeanne Ballard: http://www.ballardscore.com/
First Few Hours

• On YouTube you can find Dr. Ballard describing her method in several chapters: New Ballard Score Chapter 1 to 5
• Good Resource on heart and lung sounds and neonatal photos at Stanford University
  http://newborns.standrd.edu/PhotoGallery/REspNL1.html
First Few Hours

- Common Newborn Reflexes include:
  - Startle response (Moro)
  - Walking/Stepping
  - Rooting
  - Sucking
  - Palmar Grasp
  - Babinski Reflex
  - Galant Reflex
  - Tonic Neck Reflex

*Watch for excessive sleepiness or unresponsiveness*
First Few Hours

- Sugar levels are important but you may not be able to test. Even a healthy newborn may have a drop in glucose.
- Temperature instability is possible even in a term infant
- Airway
- Blood Pressure
- Lab Work if blood can be drawn
- Emotional Support
- These are the key elements of the S.T.A.B.L.E. Program
Stabilization Resource

- S.T.A.B.L.E. (Sugar & Safe Care, Temperature, Airway, Blood Pressure, Lab Work, and Emotional Support)
  www.stableprogram.org/
Age Appropriateness

• Measure the weight, length, and head circumference to make sure they are appropriate for the gestational age.
• Measure the weight on a scale that has been calibrated (without diaper or clothes).
• Measure the length from the top of the head to the foot with leg extended.
• Measure the head circumference just above the eyebrows and ears.
• Does the infant appear well nourished? Or very thin? Compare to standardized growth charts.
First Few Hours

• Review the prenatal history if possible. Look at the notes regarding the delivery. Were there any complications? Summarize and plan care.

• Continuous observation is encouraged.

• What does the first stool look like?

• What does the urine look like?

• If blood tests have been done—what are the results?

• What is the gestational age and is the weight, length, and head circumference appropriate for this age?
First Few Hours

• Delayed urination past the first 24 hours of life
• Delayed stooling past the first 24 hours of life
  • Both may be indications there is a problem such as an obstruction or a structural abnormality
Head to Toe Assessment

• Requires training and experience
• Must be done with consideration for the infant’s condition.
• Wash hands and use clean equipment for the assessment
• During the Physical Assessment-keep the infant warm, uncovering one part at a time
• Protect the baby’s eyes from direct light
• If parents are present explain what you are doing and seeing
• This is a time that the infant is at greatest risk for infection.
• Jaundice is another problem that may appear after discharge.
• Dehydration is another problem.

• An abnormality or problem such as an obstruction may appear. For example, a gastrointestinal disorder, metabolic problem, cardiac anomaly.
First Days and Weeks

• There are two types of sepsis:
  • Early Onset—appearing before 72 hours of age
  • Late Onset—after 72 hours of age

• Early onset is often seen in the form of pneumonia or sometimes meningitis; usually associated with an infection acquired in utero
• Late onset is associated with hospital acquired infections and is seen as septicemia, pneumonia, and meningitis

• Symptoms are often very subtle, vague—may be the infant looks more pale, lethargic, does not feed as well as in the past, hypothermic, rarely has fever at first.
Parental Involvement

• Teach the parents how to assess the baby.
• Make sure they are taught to trust their judgment. If they think something is wrong it probably is.
• Remember having a sick baby is stressful but so is having a new healthy baby. Teach them what to expect.
• If they are present during the examination explain to them what you are doing and seeing.
Other Considerations

- If possible conduct the assessment in a quiet area.
- If possible have the infant in an alert state.
- Sooth and comfort infant during the assessment and stop if too agitated.

- Keep a log or notes that can be used for tracking the progress of a neonate.
- The notes can form the basis of teaching parents how to care for their infant.
- The notes provide information for discharge.
Neonatal Assessment Resources

• Not everything on the internet is reliable
• Check the resource, for example is it a credible health care or educational institution or a professional organization?
Additional Readings and Videos

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Thank You