Peer Reviewed

The Honeymoon Period

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Objectives:

- Take notice of the clues that a baby is decompensating
- Decide if a baby needs CPAP or HFNC
- Explain how the PDA affects a baby's work of breathing
- Describe why babies < 36 weeks are at risk
- Watch for and determine the signs of sepsis

In most hospitals, babies under a certain gestational age will automatically go to an observation area or NICU. If a baby is over 36 weeks gestation, the baby may room with the mom after an initial assessment. Periodic assessments by the nurse or the doctor will then determine if the baby can stay with the mom or needs to go into an observation area or the NICU. This is the honeymoon period: the first 24 hours (up to 48 hours) when the baby initially looks good. Nevertheless, as circulation transitions to extrauterine life, and the baby must breathe independently and generate and maintain his body heat, you may notice some concerning things. At this point, the care must be elevated to a certain level. Otherwise, you are likely to be in trouble. The assessment intervals for these newborns need to be more frequent. Take notice of the clues they give that they are decompensating: Is the baby cold? Desaturating? Hypovolemic? Each of these needs to be addressed as soon as possible.

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There is not so much of an age cut-off that you stop being concerned so much as how close to term the baby is. Is the baby feeding, staying in the mom's room, and maintaining temperature and vital signs? The closer to term, the better, but that first hour is critical to successfully transitioning to extrauterine life.

The question often arises, do all preterm infants require CPAP? Many hospitals have a protocol to automatically start CPAP on any baby less than a certain number of weeks. Any baby that is having any respiratory distress or increased work of breathing, that baby probably deserves a trial of CPAP. However, it is also essential to rule out other causes of respiratory distress.

If your hospital tends not to do any preemptive treatment and watch the baby, remember that preterm babies have neither mature muscles nor surfactant. Ensure the baby is warm and appears comfortable. Cold babies or otherwise uncomfortable babies do not do well. Ensure the baby's in a neutral thermal environment, or you can swaddle or have the baby skin – to skin with mom. Monitor the temperature and the rest of the vital signs carefully, and continuously monitor saturations.

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What liter flow or CPAP level should we start with these babies if needed? There are many different CPAP delivery systems. Some systems run on flow, and others run off a ventilator and only allow you to set pressure. With HFNC, the interface should only occlude 50% of the nares, allowing for a large leak. For NCPAP, approximately 80% of the nares should be occluded to generate pressure. However, there is still a leak to be accounted for. If you calculate the approximate minute ventilation requirements based on the baby's weight and factor in the leak, you will arrive at a starting point. For example, a 3-kilo baby's minute ventilation is approximately 900ml per minute. Given a leak of about 50%, you need 1.8 liters per minute to meet or exceed that baby's minute volume demand. For smaller babies, calculate accordingly, using 250-300ml/minute.

What settings do we put these babies on to avoid overshooting or undershooting the proper flow or pressure? Most NICUs start with a CPAP of +5 for the tiniest babies and +6 for larger babies. The work of breathing or level of respiratory distress should decrease. If not, the baby may require more pressure or flow until breathing appears comfortable.

How do we best determine if a baby is comfortable? Furthermore, what does the term 'comfortably tachypneic' mean? If you see the angst in the baby's face, a brow that looks frowning, or the baby pulling the sternum to the spine, those are subtle signs. If a baby appears comfortable yet is tachypneic, depending on the baby's

gestational age, that baby should still be watched closely.

Moreover, babies on CPAP should still get chest x-rays to determine if the baby is overdistended. If the baby appears overdistended, ensure your set flow or pressure is not too high. Even with a bubble CPAP device, with the column set to +6, much excess flow can lead to overdistention. Another way to determine overdistension is to transilluminate the baby's chest.

The ductus arteriosus is an integral part of the Honeymoon period. It is typically not a problem in the early hour because you have elevated pulmonary vascular resistance for a time. However, there can be very pronounced shunting as you move forward, and pulmonary relaxation occurs. That baby would have low blood pressure and could become the sickest kid in the intermediate area.

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Fluids affect the PDA in that too much fluids potentiate the PDA being open. Moreover, too few fluids cause the kidneys to clamp down. Some NICUs have used indomethacin for larger preterm babies, which does not seem to be all that helpful. Most PDAs close on their own. Certain smaller preterm babies do benefit from indomethacin. Then there is the phenomenon known as the "winking PDA." What is making the PDA close, then relax, then close again?

More than one data point needs to be followed with a winking PDA. If the PDA is opening in concert with falling blood pressure and difficulty in managing ventilation, we need to advocate for ligation or placing a plug by cath. A PDA can also be bidirectional, which has to do with cardiac issues potentially involving pulmonary artery hypertension, which we will discuss in a different talk. If there was a sudden increase in oxygen requirement AND more episodes of A's and B's, that situation requires much more attention.

If there was a sudden increase in oxygen requirement on these preemies, look for possible pneumothorax. Failing that, look for atelectasis. Transilluminate first, then call for an X-ray and look for atelectasis.

If a baby has more and more episodes of A's and B's, the first thought should be sepsis. Considering gestational age, is this the baby who would benefit from just caffeine? To be sure, get a CBC and a blood culture. Start antibiotics if indicated. There is a Kaiser scale for sepsis that is embedded in a lot of the EHRs.

As always, we need to consider the parents. They may be anxious about an early delivery, relieved that the baby initially looks OK, and a team of people are present to reassure them. Then, things start going south. The baby must be moved to the NICU - IVs, CPAP, and many machines. Their baby does not look like a baby anymore. As we focus on the baby, remember that the parents need support as well.

In summary, besides the mantra of 'never trust a preemie,' make sure to give him a chance. It is true. Never underestimate what a preemie can do when you are not looking. Furthermore, be aware of the unavoidable and be prepared. If you must intubate or start antibiotics, keep those possibilities in your mind. Even though you hope for the best, always be prepared for the worst.

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POST-TEST

1. Once the baby is one hour old, he or she is past the danger zone

True

False

2. Signs that a baby is decompensating include:
a. Increase in As and Bs
b. Unstable blood pressure
c. Unstable sats
d. Increased work of breathing
e. All of the above

3. A 36-week newborn is crying in the DR. This baby does not need any special assessment.

True. If they can cry, their lungs are fine.

False. Thirty-six weeks is not quite term, and this baby should have a respiratory assessment and be monitored closely.

4. The determination to place a baby on CPAP vs. HFNC is often made by:
a. Neonatologist preference
b. Desaturating babies go on CPAP, while stable but tachypneic babies go in HFNC
c. Availability of equipment and convenience

5. Signs of sepsis include:
a. More episodes of Apneas and Bradycardias
b. Dusky color
c. Hypothermia

6. A swaddled 35 and 5/7 week baby has a core temp of 35 C.

This baby needs:

a. More blankets
b. To be moved to a warmer
c. To be kept skin-to-skin with mom
d. A NICU bed and close monitoring to ensure the baby will not become cold-stressed.

7. A preterm baby's minute volume demand is about:

a. 100-150 - ml/Kg/min
b. 150 - 200 ml/Kg/min
c. 250 - 300 ml/Kg/min
d. 5 to 6 L/min

8. The correct flow or pressure to offset a baby's work of breathing is ensured by:

a. The baby appears comfortable
b. The baby does not appear to have any extra work of breathing
c. The saturations are stable
d. All of the above, together

9. In a one-week-old baby with a PDA and no cardiac defects, the blood usually shunts:

a. Left –to-right
b. Right –to-left

10. A baby has a sudden increase in oxygen requirement. You should consider:

a. Sepsis
b. Pneumonia
c. RDS
d. Auscultating to assess for Pneumothorax

Disclosure: The author has no disclosures.

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