The Golden Hour in the Neonatal Intensive Care Unit

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Golden Hour captures photographers and social media influencers because of the cinematography of the sun in this last hour before sunset, and the first hour before sunrise is spectacular by the beach or up the mountain. It is a sign of hope and a new day on posters or social media posts. Golden Hour is about something other than capturing a great photo opportunity in the NICU. It is the first 60 minutes of life, where extensive preparation, assessment, and care are administered to a preterm or term infant upon delivery.

According to research, the term Golden Hour started in adult trauma, wherein the first hour is dedicated solely to trauma management.

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The primary goal of the golden hour is to use evidence-based interventions and treatments to achieve better neonatal outcomes, especially in extremely low gestational age neonates (ELGAN).

The second goal was to use the best evidence-based practice available, beginning with non-invasive procedures like gentle stimulation depending on age, CPAP, and thermoregulation, followed by invasive procedures such as IV lines, Umbilical catheters.

What are the elements that we focus on during this hour?

The NICU team should:

- Start with gathering labs from blood samples.
- Perform temperature regulation.
- Determine Delayed or Early Cord Clamping.
- Monitor basic vitals like the BP and O2 sat %.
- Assess the need for surfactants based on gestation and clinical manifestation of the baby.
- The Neonatologist assesses the baby's body systems. If, within Golden Hour, a baby has been admitted to the NICU, each team member assumes a role. The Respiratory Therapist monitors the respiratory status and works with the nurse to ensure temperature regulation and infection control measures are performed. Not every baby in this golden hour gets CBG or receives Oxygen or CPAP. However, babies admitted just for observation should be closely monitored by a Respiratory therapist, even for one documented respiratory assessment.

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The Components of the Golden Hour

Component 1: *Antenatal Counseling:*

- The Antenatal period is the minutes immediately post–delivery.
- The Neonatologist will first counsel the parents on the estimated gestational age and the associated risk factors.
- Studies show that preterm infants, especially very low birth weight babies, have a high mortality rate and high occurrence of neurodevelopmental disabilities.
- This component aims to inform parents of the baby's condition and assist them in decision-making, for example, if the team will provide full code or comfort care.

Component 2: *Neonatal Team*

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The respiratory is responsible for the airway; RN receives the baby and checks HR, performing stimulation and drying. A person that could intubate should be present in high-risk deliveries. Depending on Hospital protocol, everyone

Every team member should be NRP certified and attend high-risk or term delivery.

The What, WHY, and How before Delivery Or "Heads-up"

- Everyone should be Informed of the expected neonatal admission, especially if the team will attend the birth of any preterm neonate or high-risk term neonate.

  (https://mhnpjournal.biomedcentral.com/articles/10.1186/s40748-017-0057-x)

- Pre-check all equipment needed during resuscitation. Using a pre-resuscitation check-off list is ideal and speeds up the process.

- Prepare for multiple births, from twins to octuplets. Know the maternal history in detail from the maternal records and shared with the team leader. Usually, the OB will debrief the team on the latest before proceeding with a procedure like a c-section.

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Component 3: *Delayed VS Early Cord Clamping*

- Delayed cord clamping (DCC) is clamping of the cord after the stoppage of placental circulation, within 30 seconds to 3 min after neonatal birth. DCC for one minute led to the transfer of 80 ml of extra blood, and a delay of three minutes led to a total transfer of 100 ml of blood to the Neonate.

- The candidates for DCC are term and stable infants. For Preterm babies that need resuscitation, ECC is necessary.

- Early Cord clamping (ECC) is the method of cord clamping when blood circulation is still present from the placenta to the newborn. The cord is clamped immediately after birth or Within 15 seconds of birth.

Studies showed that delayed cord clamping is associated with:

- Fewer infants requiring transfusions for anemia (RR 0.61, 95% CI 0.46 - 0.81),

- Less intraventricular hemorrhages (IVH) (ultrasound diagnosis all grades) (RR 0.59, 95% CI 0.41- 0.85) and

- Lower risk for necrotizing enterocolitis (NEC) (RR 0.62, 95% CI 0.43 - 0.90)

- One thing to note: Bilirubin concentration was significantly higher in neonates allocated to DCC compared with ECC (mean difference 15.01 mmol/L, 95% CI 5.62 - 24.40). It resulted in increased Jaundice and the use of phototherapy for DCC babies. (Rabe H, Diaz-Rossello JL, Duley L, Dowswell T. 2019 Sep)

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Component 4: *Prevention of Hypothermia*

Temperatures < 36.5 °C are a dangerous problem in newborns, especially for preterm infants. There are several ways to keep the baby warm, such as:

- Prewarming the isolette

- Using plastic wrap or bag, caps, or thermal mattress.

- Transporters must be pre-warmed and ready for transport.

- Pre-Warm, humidified gas should be prepared in equipment such as Ventilators or non-invasive like CPAP.

- Possible skin-to-skin contact with the mom is one way to keep the infant warm.

- The delivery room temperature is preferred to be from 26 to 28 °C, which may keep the babies warmer.

Component 5: *Respiratory Support*

- Think NRP when it comes to Respiratory and Cardiac support.

- We have learned that term and preterm infants are prone to respiratory distress, a priority when attending a high-risk delivery.
- Everyone in the delivery room needs to Follow current NRP guidelines in resuscitation.
- Determine the need for respiratory support, such as intubation, or a non-invasive method like Mask CPAP or NIV, based on the baby's respiratory condition and the doctor's order.
- Be ready to administer surfactant.

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Component 6: *Cardiac Support*

- The first step is to check the baby's heart rate. The team member can count the number of beats in 6 seconds and multiply it by 10. A more accurate method is to have the team member tap out the heartbeat with their finger. The assigned person will state the heart rate to the team. The Initial HR determines the next step of intervention based on the current NRP guidelines.
- Manifestations of cardiac anomalies will surface in PDA, PFO, and PPHN. Look at pre- and post-ductal oxygenation, perfusion, auscultation, and X-ray results.
- UA UV and IV Lines are best placed in the golden hour for immediate fluid access.

Component 7: *Nutrition*

- The placenta is the source of nutrients for the fetus, and once delivered and the umbilical cord is disconnected, the food supply for the baby stops.
- On-term babies, breastfeeding should be introduced within the first half-hour following birth.
- On ELBW, feeding will be evaluated, by the Neonatologist will determine a strict nutritional requirement.
- The nurse will closely monitor the infant's Fluid intake. Stable preterm infants with no complications can start on feeds.
- Glucose levels are checked on term and preterm infants.

Component 8: *Sepsis Prevention*

- Neonatal sepsis and prematurity are the two most common causes of neonatal mortality and morbidity.
- Hand washing and using an aseptic technique are essential to preventing neonatal sepsis.
- All invasive procedures like umbilical lines, IV lines, and surfactant administration should be done using asepsis techniques.
- The bundled care approach between RT and RN should be made and planned accordingly.
- Respiratory therapists should keep
- CPAP and ventilator circuits should be clean, and sterile distilled water should be used for humidification.

"Depending on hospital policy, Prophylactic Antibiotics will be started by the team to prevent the Early Onset of Sepsis or EOS. Antibiotic therapy like IV Ampicillin for GBS coverage and gram-negative organisms are usually used. "

Component 9: *Continuation of sepsis*

Depending on hospital policy, Prophylactic Antibiotics will be started by the team to prevent the Early Onset of Sepsis or EOS.

Antibiotic therapy like IV Ampicillin for GBS coverage and gram-negative organisms are usually used.

Depending on the mother's prenatal history and status, antibiotics and antifungal medications are given based on the hospital policy.

Blood culture is also collected by the nurse for further diagnosis of sepsis.

Possible cause of sepsis in a newborn are:

- If a Mother is Hep B positive, their babies should receive Hepatitis B immunoglobulin and single-antigen hepatitis B vaccine within 12 hours of birth.
- HIV+ moms' babies are started on Antiretroviral for prophylaxis.
- Mom with syphilis, those babies are considered to start on penicillin.
- Vaginal deliveries can spread bacteria that can pass to the babies' skin, eyes, and mouth.

Component 10: *Cooling/Therapeutic Hypothermia for Asphyxia*

The cooling method, also called newborn therapeutic hypothermia, lowers the baby's body temperature to treat hypoxic-ischemic encephalopathy (HIE). HIE is a neonatal brain injury that occurs if your baby's brain does not receive enough oxygen. The baby's body temp is purposely lowered to around 89°F to 93°F (32°C to 34°C).

Sample of a Cooling Protocol (refer to hospital policy or discuss with Neonatologist):

- Evidence of fetal distress or neonatal distress as evidenced

by one of the following: i., history of the acute perinatal event (e.g., placental abruption, cord prolapse, severe fetal heart rate abnormality);

- pH ≤7.0 or base deficit ≥16 mmol/L in a cord or postnatal blood gas obtained within the first hour of life.
- 10-minute Apgar score of ≤5; iv. Assisted ventilation should be initiated at birth and continued for at least 10 minutes; c) evidence of moderate to severe neonatal encephalopathy by examination.
- Lactate level- high levels indicate HIE. Normal for 0 – 90 days is 1.1-3.5 mmol/L

Component 11: *Labs and Monitoring*

Laboratory results are essential in the golden hour. Standard testing for babies exhibiting distress may include:

- Complete blood count,
- Blood culture, glucose,
- Arterial blood gas (ABG) analysis/capillary blood gas, and
- Chest X-ray (CXR)

Component 12: *Monitoring Vitals*

Monitoring and recording are a critical factor in the Golden Hour. Some important measurements include:

- Heart rate,
- Respiratory rate,
- Capillary refill time,
- Invasive or non-invasive blood pressure
- Saturation

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Pediatrician or RN counsels the mother regarding maintaining temperature and frequency of breastfeeding, emphasizing starting early feeding and maintenance of asepsis in newborn care.

For unstable babies admitted to NICU, neonatologists discuss the baby's present status with the parents, interventions made until that time, and further management plans.

The Neonatologist should explain all necessary consents obtained by the RN from the parents, like admission, procedure, transportation, and starting of hypothermia or other protocols.

Competent 13: *Pre-Transport*

The NICU team should first stabilize Neonate. When shifting to a tertiary health care center and the receiving hospital should be informed regarding this transport so that the Neonate receives the required care on reaching the center.

In summary, the Benefits of Golden Hour Care are the following:

- Increase the number of infants with an admission temperature of 36.5 °C – 37.4 °C.
- Decrease in the incidence of ROP and BPD
- Significant improvement in time of surfactant administration
- Improvements in time to start dextrose and amino acids infusion.
- Decrease in time to give antibiotics.
- Decrease in the incidence of IVH.
- Faster placement of umbilical catheters
- Significant reduction of the time to reach NICU after delivery.
- Glucose greater than 50 mg/dL.

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