Maternal, Newborn, Child & Youth Network
PARTNERS IN HEALTH CARE EXCELLENCE

GUIDELINES FOR COMPLETION OF ILL NEWBORN RECORD

The Ill Newborn Record was developed to assist nurses in the assessment and management of newborn infants who are post-resuscitation, otherwise unwell, or at risk of becoming unwell. It is used to provide an efficient mechanism for systematic assessment and documentation of relevant findings. It is best to use it in conjunction with the ACoRN (Acute Care of at-Risk Newborns) primary survey and ACoRN sequences.

HOSPITAL IDENTIFIER

The MNCYN logo is at the top left corner with space provided to add the hospital name.

PATIENT IDENTIFIER

Space at the top right corner is for patient identification information.

TIME

The frequency of assessments will depend on the status of the infant.

NEUROLOGICAL

Abnormal neurologic signs include abnormalities of activity, tone, level of alertness or movements. These abnormalities may be transient but they may be indicative of more serious problems. Prompt management may prevent or reduce long term morbidity. (ACoRN, p.152)

ACTIVITY: ** Use the key code to indicate the appropriate level or type of activity.*

- Normal newborn activity is evident by regular sleep-wake cycles, and appropriate responses to the environment and handling. (ACoRN, p.154)

JITTERINESS OR TREMORS:

- Involuntary, rhythmic oscillatory movements of equal amplitude (ACoRN, p.157)
- Will usually cease when the extremity is contained or passively flexed (ACoRN, p.158)
- May be normal or abnormal (ACoRN, p.158)

SEIZURE ACTIVITY: (ACoRN, p.159)

- Occurs due to a pathologic cause and often migrates from one body area to another.
- Seizures may be characterized by:
  - Horizontal tonic deviation of the eyes
  - Repetitive blinking or staring
  - Chewing, lip smacking or drooling
  - Bicycling of legs and other rhythmic, purposeless movements
  - Posturing
  - Course jerking movements of 1-2 limbs migrating to contralateral part of body
  - Rhythmic, slow movements of face, and/or extremities on one side of body
  - Apnea, sudden increased HR or BP, or decreased SpO2
  - Sustained rigid posturing of limb, trunk or neck
  - Flexion or extension of neck, trunk and upper limbs, extension of lower limbs
  - Rapid contractions of flexor muscles in 1 limb, several body parts or whole body

TONE: (ACoRN, p.154)

** Use the key code to indicate the level of body tonicity.*

- Infant tone is best observed at rest by assessing for:
  - Posture, resistance to movement and return to resting position
  - Range-of-motion in knees, elbows and shoulder joints
  - Extensor and flexor tone of neck when pulled to sit (*do not assess if unstable or suspected birth injury)*
  - Posture when suspended ventrally *(do not assess if unstable or suspected birth injury)*

TEMPERATURE

- Normal Temp.: 36.5°C – 37.5°C (ACoRN, p.293)
- Infants at risk of temp. instability, requiring close observation or frequent interventions should be cared for on a radiant warmer or incubator (ACoRN, p.387)
- Assess temp. q 15 – 30 min. until stable then q 1-2 H (ACoRN, p.297)

- *Infants with Hypoxic Ischemic Encephalopathy (H.I.E.) may require passive cooling to 33℃ - 34℃ by turning off the radiant warmer or incubator. (only done in consultation with Level 3 Centre) (ACoRN, p.295)*

SERVO CONTROL: (ACoRN, p. 389)

- Servo control mode is recommended for use with neonates. Place the servo control probe on the upper right quadrant of the abdomen with the flat side against the skin and secure with an adhesive reflective cover. If the infant is prone, place the servo control probe on either flank.
- Set alarm limits 0.5 °C above and below the desired temp. range.

INCUBATOR/RADIANT WARMER:

- Document the temp. of the radiant warmer or incubator at the same time as the servo control and axillary temp. (ACoRN, p. 389)

Choosing the initial incubator temperature in the first 12 hours of age

Birth weight (grams)	Air temperature setting °C (double wall, humidified incubator)
< 750	39.5 (37.5)
750 to 1000	39.0 (37.0)
1000 to 1200	37.5
1200 to 1500	36.5
1500 to 2000	35.5
> 2000	34

Adapted from: Jaimovich DG, Vidyasagar D. Handbook Pediatric and Neonatal Transport Medicine (2d Edition). Philadelphia: Hanley & Belfus, Inc. 2002, p. 483

Solimano, A. et al ACoRN – Acute Care of At-Risk Newborns 2012 Update. 8-9

TABLE 1: RECOMMENDED INCUBATOR TEMPERATURES WHEN USING AIR TEMP. MODE (ACoRN p.388)

AXILLARY TEMPERATURE:

- If using the air temperature mode (or manual) for the radiant warmer or incubator, document the infant's axillary temp. in °C using an electronic thermometer. Glass mercury and tympanic thermometers are not recommended for neonatal use. (ACoRN, p. 293)

CARDIOVASCULAR / RESPIRATORY (ACoRN, p.98)

During the transition from intrauterine to extrauterine life, establishing and maintaining ventilation, oxygenation and thereby adequate cardiac function is crucial. Inability of the infant to achieve adequate ventilation is a primary cause of cardiovascular compromise. Once effective ventilation and oxygenation have been achieved, cardiovascular instability is most commonly due to decreased oxygen delivery to tissues as the result of one or more of the following:

- Insufficient circulating blood volume
- Poor cardiac muscle function
- Abnormalities of heart and great vessels (cyanotic or acyanotic congenital heart disease)
- Abnormality of heart rhythm (tachyarrhythmia or bradyarrhythmia

Apply pulse oximeter, cardiorespiratory and BP monitor to all infants requiring stabilization care.

HEART RATE (HR): (ACoRN, p.104)

- Normal HR (Term): 100- 140 bpm (A resting HR of 80-100 bpm in sleeping term infant is common in first few days post- birth.)
- Normal HR (Preterm): 120-140 bpm
- A heart rate > 220 bpm is suggestive of supraventricular tachycardia (SVT).
- Infants with persistent tachyarrhythmia may have low tone, reduced activity, decreased alertness or other signs of shock. (ACoRN, p.106)

BLOOD PRESSURE (BP):

- Infant's gestational age in completed weeks is a practical estimate of the normal lower limit of Mean Arterial Pressure (MAP) (i.e.) a 35-week neonate should have a MAP of ≥ 35 in the first day of life. (ACoRN, p. 103)
- Low BP may be an indication of low circulating blood volume, low vascular tone, or low cardiac output (ACoRN, p.100)

RESPIRATORY RATE (RR):

- Normal RR: 40 – 60 breaths/ min.
- Tachypnea is often the first and most subtle sign of respiratory distress in infants with mildly decreased respiratory function. (ACoRN, p. 50)

RESPIRATORY EFFORT: (ACoRN, p.50)

** Use the key code to describe the respiratory effort.*

- The following signs are evidence of laboured respirations or increased work of breathing:
  - **Nasal Flaring:** Outward flaring of nostrils on inspiration
  - **Grunting:** Audible sound similar to a moan produced on exhalation
  - **Intercostal and Subcostal Retractions:** Indrawing of intercostal and subcostal spaces due to negative pressure within the chest
  - **Sternal Retractions:** Paradoxical backward movement of sternum on inspiration caused by increased negative pressure within the chest
- **Gasping**: Deep, single or stacked, slow, irregular breaths indicating a terminal respiratory rhythm. This is an ominous sign of cerebral hypoxia not an indication of laboured breathing.

COLOUR: ** Use the key code to indicate the appropriate colour finding.*

- Observations of infant skin colour provide a sense of:
  - Perfusion
  - Oxygenation
  - Hemoglobin (Hb) concentration (ACoRN, p. 33)
- **Pink:** suggests blood is well oxygenated and skin well perfused.
- **Pallor, mottled:**
  - Implies poor skin perfusion due to decreased cardiac output and/or hypovolemia, or peripheral vasoconstriction. (ACoRN, p. 105)
  - Pallor can also indicate a low Hb. (ACoRN, p. 55)
- **Acrocyanosis:** (ACoRN, p. 33)
  - Bluish discoloration of the hands and feet with a pink body
  - Often due to poor peripheral circulation or cold stress
  - Common during the first few hours of life
  - Does not require oxygen therapy
- **Central cyanosis:** (ACoRN, p.33,106)
  - Bluish discolouration (duskiness) of body, lips and mucous membranes
  - Always abnormal
  - If cyanosis improves with oxygen is likely of respiratory origin
  - If cyanosis occurs without respiratory distress or improvement with 100% oxygen, it is likely of cardiac origin
- **Jaundice:**
  - Indicative of hyperbilirubinemia
  - Abnormal in first 24 hours of life and when ≥ phototherapy treatment thresholds

FiO_2:

- Oxygen delivery is always charted in % not just litres of flow.

PULSE OXIMETRY (SpO_2):

- SpO_2 indicates how much oxygen is bound to hemoglobin.
- Target range of SpO_2 for neonates is 90 -95%. (ACoRN, p.54)

ACoRN RESPIRATORY SCORE: (ACoRN, p.55-56)

- Supports rapid assessment of severity of respiratory distress
- ***The respiratory score is used for all infants who are breathing spontaneously, including those on Continuous Positive Airway Pressure (CPAP) or Non-invasive PPV (NiPPV). It is not intended for infants who are intubated and receiving ventilation.***

Score	0	1	2
Respiratory Rate	40 - 60/minute	60 - 80/minute	> 80/minute
Retractions	None	Intercostal, subcostal or both	Intercostal, subcostal and sternal retractions
Grunting	None	With stimulation	Continuous at rest
Oxygen Requirement1	None	≤ 30%	> 30%
Breath sounds on auscultation	Easily heard throughout	Decreased	Barely heard
Prematurity	> 34 weeks	30 - 34 weeks	< 30 weeks
		Respiratory Score	__/12

TABLE 2: ACORN RESPIRATORY SCORE

Adapted from Downes JJ, Vidyasagar D, Boggs TR, Morrow GM. Respiratory distress syndrome of newborn infants. I. New clinical scoring system (RDS score) with acid-base and blood-gas correlations. Clin Pediatr 1970;9(6):325-331

***Note**: An infant receiving O_2 before an O_2 analyzer is set up or in an open O_2 delivery system is assigned a score of 1.*

Mild respiratory distress

- Respiratory score < 5 with signs starting at birth *and* lasting < 6 H

Moderate respiratory distress

- Respiratory score of 5 – 8
- Mild respiratory distress lasting > 6 H post-birth, *or*
- New onset respiratory distress in a previously asymptomatic infant, *or*
- A sustained increased in O_2 requirement > 10% above baseline, for ≥ 10 min. to keep O_2 saturations within the target range

Severe respiratory distress

- Respiratory score > 8
- Recurring apnea that requires PPV, *or*
- Infants already receiving ventilation due to respiratory failure during resuscitation or a previous passage through the Respiratory Sequence

APNEA / BRADYCARDIA:

- Apnea: lack of sufficient air movement to effectively ventilate or oxygenate the lungs.
- Infant may have airway obstruction due to poor positioning, secretions, aspiration or anatomic abnormality
- Usually accompanied by bradycardia (HR < 100 bpm), cyanosis and decreased tone

STIMULATION REQUIRED: ** Use the key code to indicate the type of intervention required.*

- Infants with apnea/bradycardia often require manual stimulation, bag/mask ventilation or free flow O_2 to recover.

GASTROINTESTINAL

VOID*: * Use a check mark to indicate if the infant voided.*

- Low urine output can be an indicator of poor circulation but only after 24 H as many infants do not void for the first 12-24 H.

STOOL: ** Use the key code to describe the stool.*

- Term infants should pass meconium by 48 H (or 72 H in preterm infants)

SIGNATURES

- Enter nurse initials in the right column
- Space is left on the bottom of the front and reverse side for signatures, printed names and initials of health care providers.

LAB VALUES

Results of common blood tests are recorded on the reverse side of the document. Normal values have been included for reference.

REFERENCE

Boulton, J. E., Coughlin, K., O'Flaherty, D., & Solimano, A. (Eds.). (2021). *ACoRN: Acute Care of at-Risk Newborns: A Resource and Learning Tool for Health Care Professionals*. Oxford University Press.