Late Preterm Infant Guidelines for the Neonatal Intermediate Care Units

**Policy Group:** Safety/Legal

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**Purpose**  
To provide clear guidelines for the admission of late preterm infants to the Neonatal Nursery including information about anticipated morbidities, and especially:

1. To recognize the differences between the late preterm and term infant and to anticipate the need for additional support.

2. To recognize the increased incidence of late preterm deliveries particularly amongst multiples.

3. To recognize the increased risk for morbidity and mortality amongst the late preterm population as compared to term.

4. To facilitate lactation support for the late preterm population as this population is at significant risk for readmission secondary to challenges with breast milk transfer and hyperbilirubinemia particularly amongst babies born at 36 weeks gestational age.

5. To facilitate the late preterm infant’s physiological stability and adaption to extra-uterine life.

6. To provide a guide for monitoring the late preterm infant in the immediate newborn period.

7. To provide a guide for determining the preterm infant’s suitability for discharge.

8. To educate and support parents/guardians of the late preterm infant.

**Applicability**  
All Covenant Health staff and physicians in neonatal intermediate care units.

**Policy Statement**  
“Late preterm” describes those infants born between $34^0$ weeks and $36^{+6}$ weeks gestation. It is important to recognize and anticipate that this population of infants is medically vulnerable in comparison to term newborns.
Policy Elements

Background

In many countries, including Canada, there has been a steady increase in the rates of preterm births over the last 20 years and late-preterm infant (LPI) births constitute the majority of that increase. As they appear physically well-developed and often weigh the same as fully mature term infants, many of these LPIs are cared for in post partum units. However, such infants are at increased risk, compared to their term counterparts, for several neonatal morbidities, for higher rates of readmission and for neonatal and post-neonatal mortality. The complications most often encountered during the initial hospital stay include respiratory distress, hypoglycemia, temperature instability, hyperbilirubinemia, infection and feeding difficulties. After discharge, especially if never admitted to an NICU or ICN, they remain at increased risk for hospital readmission, most often for jaundice and poor feeding. Caring for LPIs requires respect and understanding of their uniqueness and of their biological and physiological limitations. There is a need for specialized nursing care to provide diligent clinical evaluation and follow-up, monitoring including increased use of laboratory testing and parental education about the infant’s ongoing risks and particular care needs at the time of discharge.

POINTS OF EMPHASIS

1. The LPI requires particular attention as he/she is at significant risk for morbidities and mortality above that of the full term newborn.
2. Premature discharge from hospital consistently has been shown to be an independent risk factor for future morbidities and readmission to hospital.
3. The late preterm infant is unlikely to fulfill discharge criteria before 72 hours of life.
4. Careful assessment and documentation of accurate gestational age, as opposed to arbitrary weight criterion, are recommended per CPS Statement FN 2010-01 (Whyte, 2010).
5. Lactation support for the late preterm population is strongly recommended to prevent post-discharge problems such as hyperbilirubinemia and related feeding problems.

ANTICIPATED ISSUES

1. RESPIRATORY DISTRESS

The late preterm infant is at risk for transient tachypnea of the newborn (TTNB) especially if delivered by C-Section. Signs and symptoms of TTNB are similar to those of sepsis and therefore, infection must be considered in any infant with breathing difficulties. Severity and duration of symptoms help to distinguish TTNB or delayed pulmonary transition from more serious pathologies such as Hyaline Membrane Disease (12% incidence at 33–34 wk, 2% at 35–36 wk, and 0.11% at term) or Pulmonary Hypertension.
2. APNEA
The precise frequency of apnea of prematurity for each gestational age remains to be described but Hunt et al reported an incidence of 4-5% in infants born between 34 and 36 weeks gestation. It is also known that the LPI is at two-fold higher risk for Sudden Infant Death Syndrome than a term infant (1.4 cases per 1000 at 33–36 weeks’ gestation, compared with 0.7 per 1000 at 37 weeks’ gestation), although the mechanism for this increased risk remains to be elucidated.

3. HYPOGLYCEMIA
The multiple risk factors for hypoglycemia include respiratory distress, limited metabolic reserves, limited oral intake, thermal instability and a reduction in hepatic glucose-6-phosphatase activity. Signs and symptoms of hypoglycemia are non-specific and highly variable including irritability, jitteriness, tremors, lethargy, cyanosis, respiratory distress with tachypnea, apnea, poor feeding and hypothermia. The highest risk period is within the first 24 hours of life but this time may be extended to 36 to 48 hours for the intra-uterine growth restricted infant. Prompt recognition and management of hypoglycemia is vital to minimize the risk of an adverse outcome.

4. THERMAL INSTABILITY
Brown fat accumulation and functional maturity as well as levels of thermogenic hormones such as prolactin, leptin, norepinephrine, tri-iodothyronine, and cortisol peak at term. Given the LPI’s limited capacity for brown fat thermogenesis in association with an increased body surface to body mass ratio, a reduced subcutaneous fat layer, and a limited ability to change to a flexed posture, as many as 10% of LPIs require intervention for temperature instability. The time of greatest risk is during the immediate hours of transition after birth. Clinical signs range from pallor secondary to peripheral vasoconstriction to respiratory distress secondary to increased oxygen requirements +/- metabolic acidosis, apnea and central cyanosis. Further, hypothermia exacerbates the risk of hypoglycemia.

5. HYPERBILIRUBINEMIA
Delivery before 37 weeks is a significant risk factor for hospital readmission related to hyperbilirubinemia, particularly if the infant has been discharged before 72 hours of life. It is primarily due to immature liver function but reduced oral intake will exacerbate the propensity to develop clinically significant elevated levels of bilirubin. Of note, progressive hyperbilirubinemia in the LPI is more prevalent, more severe, and its course more protracted than in term neonates, the peak level not being reached until 5 and 7 days of life. Furthermore, the LPI has a known biological vulnerability to the toxic neurological effects of hyperbilirubinemia.
6. INFECTION
Signs and symptoms of respiratory distress in the first 24 hours may be the first indication of sepsis. Wang et al reported that LPIs were more likely to have significant risk factors for sepsis than term infants. Ten percent of this population of LPIs received antibiotics for 7 days or more.

7. FEEDING DIFFICULTIES
Although the gastrointestinal tract of the LPI quickly adapts to enteral feedings, including the digestion and absorption of lactose, proteins, and lipids, the development of synchrony between sucking and swallowing reflexes is typically not mature until 36 to 38 weeks gestation. Lower stamina, less effective sucking and fewer alert-awake state cycles contribute to a reduced oral intake over the first few days. Furthermore, any cardiorespiratory instability may delay the initiation of oral feeding and inconsistent feeding cues or demand feeding behaviors put them at risk for dehydration and slow weight gain after discharge.

**CLINICAL PRACTICE GUIDELINES**

**A. SUPPORTING THE LPI IN THE DELIVERY AREA**

1. It is strongly recommended that a minimum of one hour of uninterrupted skin to skin contact with the mother occurs immediately after delivery. At this time it is necessary to provide ongoing evaluation of vital signs and other parameters of stability. See Appendix A: LPI Risk Assessment Tool.
2. At minimum, babies born less than 36 weeks gestation require admission to NICU.¹ For babies born 36⁰ to 36⁺⁶ weeks gestation in Level 2 Covenant sites (Grey Nuns and Misericordia Hospitals) decisions about disposition to either NICU or post partum care are made in consultation with the neonatal team.²
3. It is recommended that a neonatologist in the nearest Level 2 or 3 centre be consulted for all infants born less than 37 weeks gestation outside of Level 2 or Level 3 hospitals. This consultation will assist in triaging these infants to the most appropriate medically indicated level of care (remain at Level 1, or transfer to Level 2 or 3).

**B. THE LPI IN THE NEONATAL INTERMEDIATE CARE UNITS**

1. Gestational age cut off, determined by gestational age assessment or obstetrical ultrasound/dates, for automatic NICU or ICN admission for LPIs born in Level 3 or Level 2 hospitals is determined locally.
2. An infant meeting these local gestational age cut offs should be admitted to a monitored bed in NICU or ICN and assessment and

¹ A change in practice is being piloted at the Grey Nuns Hospital commencing February 2013. The minimum gestation for admission to the Misericordia NICU remains less than 35 weeks’ gestation until the quality project results are reviewed near the end of 2013.
² At the Misericordia Hospital babies born 35⁰ to 36⁶ weeks’ gestation are to be assessed for disposition to either NICU or post partum care per LPI Risk Assessment until the quality project results are reviewed near the end of 2013.
treatment procedures should be matched to the individual infant’s needs.

3. Any late preterm infant, regardless of gestation, is most appropriately admitted to NICU if any one of the following conditions apply:
   - Minimum birth weight 2000 grams or less
   - Delayed transition: dusky/pinkness/oxygen requirement, frequent desaturations, persistent grunting respirations or tachypnea (consistent respiratory rate > 60/min)
   - Temperature instability: low temperature not responsive to usual warming techniques. Also, infants with a high temperature or with a maternal history of chorioamnionitis or fever should be admitted to NICU for monitoring
   - Low blood glucose, unresolved with feeding
   - Antenatal concerns: As for any gestational age, any concerns raised antenatally that require detailed investigation or monitoring after birth
   - Complicated labor: maternal fever, risk factors for sepsis

4. The LPI should be monitored for the following conditions:
   4.1 Respiratory Considerations
      - Assess respiratory status immediately after birth.
      - Apply cardiorespiratory monitors and oxygen saturation monitors.
      - Assess risk factors for sepsis.
      - Provide additional heat source for infants requiring respiratory support.
      - Reassess respiratory status; frequency of reassessment will depend upon symptom severity.
      - Monitor respiratory status during feeds.

   4.2 Hypoglycemia
      - Monitor blood glucose levels on all LPI for a minimum of 24 hours, a minimum of 36 hours for the growth restricted LPI. Refer to Glucose Screening Policy
      - Monitor blood glucose with any unexpected change in clinical condition, or if symptoms of hypoglycemia noted, particularly hypothermia.

   4.3 Thermal Instability
      - Pre-warm resuscitation units and overhead warmers
      - Place newborns away from vents/drafts
      - Bathing the infant should be delayed until thermal and cardiorespiratory stability has been assured.
      - Provide warmed humidified oxygen as necessary
      - Maintain a thermoneutral environment
      - Provide supplemental heat sources as appropriate: skin to skin contact, swaddling, pre-warmed blankets, incubator/radiant warmer (use servo control), Kanmed (heated water bed)

   4.4 Hyperbilirubinemia
      - Assess by gestational age and any additional risk factors for hyperbilirubinemia such as: bruising, cephalohematoma,
vacuum or forceps delivery, ABO incompatibility or other hemolytic disease, east Asian race

- Assess feeding adequacy
- Observe for the presence of jaundice at each assessment but do not rely on visual assessment of jaundice alone
- Measure bilirubin level in any infant with evidence of jaundice in the first 24 hours of life
- Interpret bilirubin levels using an hour-of-age specific monogram. Refer to Bilirubin Risk Monogram 34-42 weeks Policy
- Transcutaneous bilirubin meter (TcB) may be used if the infant has not been under phototherapy lights
- LPI should have a serum bilirubin level checked at 72 hours or prior to discharge unless regular TcB measurements have been made as part of an established program. Refer to Universal Pre-Discharge Transcutaneous Bilirubin Screening of Term and Late Preterm Infants Policy and Procedure

4.5 Infection

- Review antenatal and peripartum histories for any risk for sepsis
- Consider sepsis work up and antibiotics for any infant with signs of respiratory distress

4.6 Feeding Difficulties

- Discuss with the parents the benefits of breastfeeding or providing breast milk for a preterm infant
- Educate the infant’s mother about behavioural state and early feeding cues
- Assess adequacy of latch and suck
- Consider test weighing before and after a breast feed as a method to assess intake
- Monitor intake and output daily, including daily weighing
- Monitor the infant’s ability to sustain adequate intake when orally fed on demand
- Early sustained lactation support is essential

C. NICU CONSULTATION FOR THE LPI IN POST PARTUM

Note: All components in Section C also apply to LPIS admitted to the Healthy Newborn Nurseries where they exist.

1. Some LPI, especially those born 36 weeks gestation or greater, may be well enough to be admitted to post partum care initially, though require increased ongoing surveillance.

2. For LPI admitted to post partum care, consultation with NICU is appropriate for any concerns, but especially for the following:
   - Duskiness requiring oxygen, apnea, persistent tachypnea or grunting respirations
   - Symptomatic or persistent hypoglycemia
   - Need for tube feeding
   - Seizure or abnormal movements
   - Listless or unresponsive
Abdominal distention in association with delayed passage of meconium or vomiting

D. DISCHARGE AND FOLLOW UP CONSIDERATIONS

1. Late preterm infants, especially those admitted to NICU or ICN, are not expected to reach physiological stability and meet appropriate discharge to home criteria before 72 hours or more.

2. At 72 hours of age or more, the LPI may be suitable for discharge to home if there is documented stability for at least 24 hours including:
   - Successful feeding, manifested as: good urine output, feeding 2-3 hourly at the breast or 3-4 hourly if formula fed or a combination of breast with supplementation, without excess weight loss (no more than 7-10% loss of birth weight)
   - Stable vital signs, including temperature maintenance without need for intervention
   - Adequate voiding, manifested as 6-8 wet diapers in 24 hours
   - Passage of meconium, and at least one stool in 24 hours on an ongoing basis. Changing stool is reassuring of adequate intake early on.
   - No signs of sepsis
   - Documented bilirubin in the low risk zone

3. As deemed appropriate, and where available, a formal documented assessment by a Lactation Consultant has occurred prior to discharge.

4. As for all infants born less than 37 weeks gestation, the LPI requires a carseat evaluation to assess for respiratory stability in a more upright position. Refer to Carseat Evaluation Policy.

5. Early community follow-up assured within 48 hours of discharge, with ongoing attention given to feeding, weight, and measuring bilirubin levels for up to 5-7 days of life.

Related Documents
- Carseat Evaluations
- Glucose Screening Policy
- Bilirubin Risk Monogram 34-42’ weeks
- Universal Pre-Disposition Transcutaneous Bilirubin Screening of Term and Late Preterm Infants Policy and Procedure

References


Fetus and Newborn Committee. Canadian Pediatric Society. Guidelines for detection, management & prevention of hyperbilirubinemia in term and late preterm newborn infants (35 or more weeks gestation). Pediatric Child Health. 2007; 12(Supp B):1B-12B.


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