Guidelines for Care of the Late Preterm Infant

November 2021

This is a clinical guideline only, intended for use by perinatal health professionals. Practices may differ across facilities, depending on available resources and prescriber preference. All policies and procedures must be approved by the appropriate processes within each facility/Nova Scotia Health (i.e.: Maternal/Child or Perinatal Committee, Medical Advisory Committee, etc.)

RCP Guidelines: Care of the Late Preterm Infant

The RCP endeavors to be respectful of gender identity and the multiple ways in which individuals may identify themselves as a parent. While most people experiencing pregnancy identify as a woman, some do not. Thus, we have used gender neutral terminology to ensure that this document is inclusive. The RCP encourages healthcare professionals to engage in respectful conversation with patients regarding their gender identity and their preferred pronouns, and to apply RCP guidelines as appropriate to meet each person's needs.

The Late Preterm Infant (LPI) guidelines are divided into the following sections:

1. **Clinical care guidelines for the LPI** including
    a. initial assessment and stabilization, and ongoing assessments following stabilization
    b. admission considerations for ongoing care and assessments, including nursing assessment in the post partum setting. This information is at the beginning of the document (pages 2-4) for easy access.
2. **Clinical risks of the LPI** for
    a. respiratory distress
    b. sepsis
    c. hypothermia
    d. hypoglycemia
    e. feeding difficulties and/or poor weight gain
    f. hyperbilirubinemia, and
    g. neurodevelopment.

    Each clinical risk provides specific care requirements and strategies to reduce the risk. The blue boxes outline why the LPI is at increased risk.
3. **Discharge considerations** for LPIs including
    a. physical assessment
    b. feeding
    c. screening, and
    d. appropriate follow up.
4. **Family education** and resources to provide education and consistent information to families.

At the time of development, the content of the LPI Guidelines aligned with both national and international guidelines, and the links and references were current and functional. Clinical care recommendations change rapidly; therefore, guidelines may change before the LPI guidelines can be updated to reflect the changes. Care providers are required to follow the existing standard of care and individualize care to each clinical situation.

The Reproductive Care Program of Nova Scotia gratefully acknowledges the perinatal care providers throughout Nova Scotia and IWK Health who contributed to the development of these guidelines for care of the late preterm infant.

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PREAMBLE

The Late Preterm Infant (LPI) is defined as one who is born between 34 0/7 and 36 6/7weeks gestation; LPIs account for approximately 70% of all preterm births in Nova Scotia. The term 'late preterm infant' has replaced 'near term' since the latter infers these infants are 'close enough' to term and just a smaller version of the term infant that requires similar care. Compared with term infants, LPIs are physiologically and metabolically immature, have higher rates of morbidity and mortality, and higher rate of readmission for jaundice, feeding difficulties, dehydration, and suspected sepsis. LPIs may experience delays in the transition to extrauterine life and are at risk for various morbidities.

The LPI who is born greater than or equal to 35 weeks gestation may be admitted to the postpartum setting (women and children's health unit/family newborn care unit) with their parent. The LPI requires frequent assessment and close observation due to their inherent risks and medical vulnerability compared to the term infant. The following guidelines focus on these infants cared for in a postpartum setting and will support health care providers in the proactive approach to the care requirements, assessment, monitoring, and discharge planning of the late preterm infant.

GUIDELINE STATEMENTS

1. The attending newborn care provider is responsible for the transfer/admission of a late preterm infant and should be notified prior to the transfer.
2. If risk factors (as outlined in Clinical Care Guidelines: Admission Considerations below: page 3) are identified a pediatrician or neonatologist should be consulted for further investigation and care planning.
3. Care providers should provide clear and consistent information to the family on the clinical risks and typical hospital course of the late preterm infant.

GUIDING PRINCIPLES AND VALUES

1. Care of the LPI should be coordinated and implemented in a family centred, developmentally appropriate, and trauma-informed manner, and within the context of the family's culture.
2. The LPI should remain in skin-to-skin contact with birthing parent or delegate whenever possible. (IWK- 1745/NSH MC-NB-001 Skin-to-Skin Contact for Healthy Term Infants).
3. The administration of oral sucrose, breast/chest-feeding and comfort positioning support the LPI during painful procedures while in hospital. (Refer to local facility policy and/or preprinted orders for further details).

CLINICAL CARE GUIDELINES FOR THE LATE PRETERM INFANT

Initial Assessment and Stabilization

1. The attending care provider for the birthing parent determines gestational age (GA) based on early ultrasound evaluation. If that information is not available, or if there is a concern with clinical discrepancy, follow the Reproductive Care Program Guidelines for 'Best Estimate of GA'
   1.1. **Notify newborn care provider of any suspected discrepancy between documented GA and clinical assessment.**
2. Review birthing parent history and **notify newborn care provider of any antenatal or peri-partum risk factors that may impact the infant's ability to transition to extrauterine life (e.g. diabetes, hypertension disorders, opioid use, intrauterine growth restriction, infection, etc.).**
3. Stabilize infant and assess respiratory status as per Neonatal Resuscitation Guidelines (NRP).
4. Dry infant on birthing parent's body and cover with warm blankets and hat.
5. Keep infant warm and dry during assessment and evaluation.
6. Whenever possible, birthing parent and infant should remain together in skin-to-skin contact (SSC) to promote breast/chest feeding, physiological stability, and adaption to extrauterine life.
7. Carefully position the infant in SSC and closely monitor for any signs of respiratory distress or airway obstruction.
8. Perform all assessments during SSC and delay any non-urgent procedures that would require separation of the birthing parent-infant dyad until after the first feeding.
9. Monitor and document the infant's respiratory rate (RR), colour, and work of breathing closely during the first hour after birth.
10. **Notify newborn care provider of any abnormal assessment findings** (Refer to local facility policy on care of the newborn for detailed information).
11. Initiate breast/chest feeding within the first hour of birth.
12. Encourage formula fed infants to feed within 1-2 hours after birth, ad lib on demand.

Ongoing Assessment after Initial Stabilization

1. The infant should remain in skin-to-skin contact (SSC) whenever possible.
2. Assess the following every 30 minutes until the infant's condition has been stable for 2 hours.
   Note: More frequent assessments may be clinically indicated for the LPI if the following assessments are abnormal/or as ordered by the newborn care provider:

2.1 **RR and effort/work of breathing.** Normal RR - 30-65 breaths/minute in the first 2 hours of life and then 30-60 breaths/minute. Respirations should be easy and free from grunting, nasal flaring, moaning, or retractions.

2.2 **Colour and heart rate (HR)**. Colour should be pink. Acrocyanosis may be present. Normal HR 90-160 BPM.

2.3 **Level of activity and tone**. Sleeping, awake (quiet or active), feeding, crying, normotonic (i.e. extremities flexed and adducted toward torso).

2.4 **Temperature** (axillary). Normal temperature - 36.5°-37.5° Celsius

2.5 **Umbilical cord**. Normal appearance with no oozing or bleeding.

Refer to local facility policy/guidelines on the care of the newborn for more detail.

3. **Perform oxygen saturations and notify newborn care provider immediately if the infant appears unwell and/or has any of the following**:
   3.1 Abnormal HR or RR
   3.2 Increased work of breathing
   3.3 Abnormal colour (i.e. pale, mottled, grey, or cyanotic)
   3.4 Abnormal tone or movement

4. Monitor for hypothermia and maintain neutral thermal environment.

5. Encourage SSC with birthing parent or delegate. If SSC is not available, care for infant under radiant warmer or cover with warm blankets and a hat and ensure infant is away from air vents and drafts.

6. Monitor for hypoglycemia. Blood glucose should be checked at 2 hours of age (ideally after the first feed), or earlier if infant is symptomatic/unwell or shows clinical signs of hypoglycemia.

Admission Considerations

1. **Notify newborn care provider prior to transfer/admission of any late preterm infant (LPI) to the postpartum setting.**

2. Stable LPIs over 35 weeks gestational age may be admitted to the post partum setting with their parent.

3. **Contact pediatrician/neonatologist on call for any of the following:**
   3.1. Gestational age less than 35 weeks
   3.2. Birth weight less than 1800 grams
   3.3. Temperature instability (i.e. hypothermia not responsive to usual warming techniques)
   3.4. Any continuous positive airway pressure (CPAP) or positive pressure ventilation (PPV)
   3.5. Respiratory distress (i.e. persistent tachypnea and/or persistent grunting, nasal flaring, moaning, and/or chest retractions)
   3.6. Low oxygen saturations requiring oxygen

3.7. Severe or persistent hypoglycemia for consideration of intravenous therapy
3.8. Any clinical concerns that require detailed investigation or monitoring

Admission Assessment on the Postpartum Unit

1. **Nursing completes head to toe assessment on admission including:**
   1.1. RR and effort/work of breathing
   1.2. HR and rhythm, presence of murmurs, colour, and perfusion
   1.3. Temperature (axillary)
   1.4. Level of activity and tone

Refer to local facility policy/guidelines on the care of the newborn for more detail.

2. If not completed in Birth Unit, the newborn care provider confirms GA following the Reproductive Care Program guidelines 'Best Estimate of GA' and completes a newborn admission assessment within 24 hours. Plot growth parameters on Fenton Preterm Growth Chart (RCP Fenton) and determine whether the infant is small (under 10th percentile), appropriate, or large (over 90th percentile) for gestational age.

3. Provide clear and consistent messages to the family on the clinical risks, anticipated length of stay and discharge considerations for LPIs.

Ongoing Nursing Assessment in a Postpartum Setting

1. **Complete assessment of the following at least every 4 hours for 24 hours:**
   1.1. RR and effort/work of breathing
   1.2. HR, colour, and perfusion
   1.3. Temperature (axillary)
   1.4. Level of activity and tone

2. **After 24 hours of age, if last 3 assessments have been within normal limits, change the frequency of assessments to every shift until discharge** (unless more frequent assessments are clinically indicated and/or ordered by attending newborn care provider).

3. **Perform oxygen saturations and notify newborn care provider immediately if the infant appears unwell and/or has any of the following:**
   3.1. Abnormal vital signs
   3.2. Increased work of breathing
   3.3. Irregular heart rate
   3.4. Murmurs
   3.5. Abnormal tone
   3.6. Appears unwell

CLINICAL RISKS FOR THE LATE PRETERM INFANT

Respiratory Distress

The following factors increase the LPI's risk for respiratory distress:

- immature lung development
- decreased surfactant
- immature breathing control
- reduced clearance of lung fluid
- decreased airway muscle tone

1. **To reduce the risk of respiratory distress:**
   1.1. Maintain skin-to-skin contact (SSC) to reduce infant stress and optimize respirations and oxygen saturation. Carefully position the infant during SSC and closely monitor for any signs of respiratory distress or airway obstruction.
   1.2. Monitor the infant's vital signs and perform any interventions while in SSC if possible.
2. **Assess for respiratory distress and increased work of breathing during feedings and when monitoring vital signs, including:**
   2.1. Tachypnea
   2.2. Nasal flaring
   2.3. Retractions
   2.4. Grunting
3. **Perform oxygen saturations and notify newborn care provider if the infant appears unwell and/or has any signs of respiratory distress.**

Note:

- It is essential to recognize symptoms of respiratory distress early and act quickly to prevent respiratory failure (i.e. cyanosis or respiratory acidosis).
- Assessments may need to be done more frequently based on clinical symptoms and severity.
- **Apnea may occur due to an immature respiratory center in the brain but is rare in the LPI.**

Sepsis

The following factors increase the LPI's risk for sepsis:

- immature immune system
- precipitating factors of preterm birth – e.g. chorioamnionitis
- exposure to nosocomial pathogens
- potential delay in initiation and establishment of breast/chest feeding
- limited transfer of birthing parent antibodies and passive immunity

Antenatal and peri-partum histories that increase risk of sepsis for the LPI:

- birthing parent group B strep positive or unknown status
- birthing parent fever
- prolonged rupture of membranes (≥ 18 hours prior to delivery)
- birthing parent cold or flu-like symptoms
- recent birthing parent urinary tract infection
- neonatal - loss of skin integrity and/or instrumentation at birth

1. **Assess for signs of infection when monitoring vital signs, including:**
   a. Respiratory distress/moaning
   b. Temperature instability
   c. Glucose instability
   d. Pale, mottled, or cyanotic
   e. Jitteriness
   f. Lethargy or irritable
   g. Difficulty with feeding
   h. Abdominal distention/vomiting
   i. Early jaundice
2. **If signs of sepsis occur, assess vital signs, oxygen saturations, and notify newborn care provider immediately**. Further diagnostic testing (i.e. septic workup) and antibiotics should be considered for any LPI with signs of illness/infection.

Hypothermia

The following factors increase the LPI's risk of temperature instability/hypothermia:
- decreased brown fat for thermogenesis and white fat for insulation
- increased heat loss due to higher surface-area-to-mass-ratio
- immature epidermal barrier / limited glycogen stores
- greater body water content
- immature metabolic mechanisms
- delayed skin blood-flow control limiting peripheral vasoconstriction

1. **Maintain a neutral thermal environment:**
   1.1. Continue SSC whenever possible.
   1.2. Cover the infant's back with warm blankets when in SSC.
   1.3. Ensure infant is covered with warm blankets and a hat when SSC is not an option.
   1.4. Keep infant's cot away from drafts and windows.
   1.5. Use a pre-warmed blanket when weighing.
2. **Monitor axillary temperature with vital signs** on admission and then every 4 hours for first 24h.
   2.1. After 24 hours, if infant has had 3 consecutive normal temperatures, change frequency to every shift until discharge.
3. Recognize temperature instability may be a sign of sepsis (refer to section on sepsis).
4. **If temperature is less than 36.5°C**
   4.1. Take action to stabilize following local facility policy/guidelines (Appendix B).
   4.2. Consider clinical status and **consult with newborn care provider to establish plan of care including checking blood glucose.**

Hypoglycemia

The following factors increase the LPI's risk of hypoglycemia:
- higher metabolic rate and rapid depletion of glycogen stores
- limited brown fat stores
- low glycogen stores
- temperature instability
- ineffective feeding due to weak suck and/or fatigue

Conditions of the birthing parent that increase the risk of neonatal hypoglycemia:
- gestational or pre-existing diabetes
- hypertensive disorders in pregnancy
- obesity
- tocolytic use for preterm labour

- prolonged/difficult delivery
- labetalol use
- late antepartum/intrapartum administration of IV glucose
- non reassuring fetal heart rate pattern

Neonatal conditions that increase risks to the LPI for hypoglycemia:

- weight < the 10th percentile or greater than the 90th percentile
- intrauterine growth restriction (IUGR)
- infants of diabetic parents (IDM)
- sepsis/respiratory distress
- hypothermia/temperature instability

1. **Follow CPS guidelines or local facility policy for blood glucose (BG) monitoring.**
   1.1. BG monitoring should be performed at 2 hours of age and then every 3 to 6 hours (before feeding). BG monitoring can be discontinued as per CPS guidelines or local facility policy.
2. **Assess adequacy of infant feeding including frequency, duration, and quality of milk transfer.**
3. **Monitor infant for signs of hypoglycemia** including:
   3.1. Jitteriness / tremors
   3.2. Sweating or hypothermia
   3.3. Pallor / cyanosis
   3.4. Poor suck or poor feeding
   3.5. Weak or high-pitched cry / Irritability
   3.6. Change in level of consciousness/limpness or lethargy
   3.7. Hypotonia / seizures
   3.8. Tachypnea or bradycardia
4. **If glucose is less than 2.6 mmol/L notify newborn care provider** and refer to CPS guidelines or local facility policy/care directive.

Feeding difficulties and/or poor weight gain

The following factors increase the LPI's risk of feeding difficulties and/or poor weight gain:

- being unwell/unstable
- difficulty maintaining a latch or fully emptying the breast
- immature suck/ swallow/ breathe/ co-ordination
- low muscle and oromotor tone
- immature feeding cues related to immature central nervous system
- limited brown fat stores for energy
- poor regulation of state behavior
- excessive sleepiness
- rapidly tiring during feeding
- ineffective milk transfer
- insufficient feeding frequency/breastmilk availability
- insufficient supplement volumes

The above issues are related to immaturity and improve as the LPI nears term.

Birthing parent risk factors that may affect successful breast/chest feeding and delay onset of milk production include:

- obesity / anemia / multiples
- caesarean or traumatic delivery / postpartum hemorrhage (PPH)
- pregnancy induced hypertension
- endocrine disorders (i.e. diabetes, hypothyroidism, or PCOS)
- treated for preterm labour
- birthing parent mental health (i.e. anxiety/depression)

1. **The two main objectives of breast/chest feeding are to protect the parents' milk supply and ensure that the infant is adequately nourished.**
   Note:
   - Separation from birthing parent and/or medical supplementation (which may be necessary) can adversely affect milk supply and establishment of breast/chest feeding. Respiratory distress, hyperbilirubinemia, hypothermia, hypoglycemia and/or sepsis can each negatively impact feeding abilities.
   - **A LPI should feed at least 10-12 breastfeeds or 8-10 formula feeds per day.**
2. **Strategies to support successful breast/chest feeding include**:
   2.1. Encourage frequent, extended periods of SSC when the birthing parent is awake. SSC supports the initiation, duration, and exclusivity of breast/chest feeding.
   2.2. Assist with milk expression as soon as possible if birthing parent and infant are separated (ideally within 6 hours of birth).
   2.3. Educate family on infant cues for feeding engagement and disengagement (Appendix C).

2.4. Encourage feeding when the infant is awake. If the infant is too sleepy to feed, encourage expression/pumping and SSC rather than attempting to latch the baby.
2.5. Teach the family techniques to facilitate effective latch and discuss optimal feeding positions (e.g. cross body position or football hold) to compensate for infant hypotonia and facilitate attachment at the breast/chest.
2.6. Assess adequacy of infant feeding including frequency (at least every 2-3 hours), duration (not exceeding 20-30 minutes), and quality of milk transfer, and provide support as needed.
2.7. Evaluate milk transfer and assist with/encourage breast/chest compressions during feeding and the use of hand expression after each feed to ensure thorough breast/chest emptying and promote lactogenesis progression and milk production.
2.8. Assess infant during feeding and if not feeding well or transferring effectively for at least 15 minutes every 3 hours support the use of an electric pump to increase breast/chest stimulation. A double kit should be provided to a parent pumping for an LPI.
2.9. Support the use of a nipple shield when required to facilitate attachment to the breast, sustain sucking, and improve milk transfer.

3. **Breast/chest feeding should be evaluated, within 24 hours of birth, and then daily**, by a lactation consultant or healthcare provider experienced with lactation management of the LPI to assess:
   3.1. Adequate latch and suck/swallow/breathe coordination
   3.2. Infant's ability to sustain adequate intake
   3.3. Parent's milk supply
   3.4. Parent's position and comfort during breast/chest feeding, level of fatigue and coping, and any concerns or questions the parent has about feeding
   Refer to the Reproductive Care Program of Nova Scotia Breastfeeding Resources

4. **Supplemental feeds are generally not medically indicated unless frequent breast/chest feeding is associated with at least one of the following:**
   4.1. A blood glucose level of less than 2.6 mmol/L
   4.2. Significant weight loss
   4.3. Dehydration (decreased urine/stool output)
   4.4. Poor weight gain
   4.5. Inability to latch/have effective milk transfer at breast/chest
   Refer to local facility guidelines for additional situations in which supplemental feedings may be considered.

5. **If medically indicated, supplement feedings after breast/chest feeding with parents own expressed milk (preferably). Suggested methods of supplemental feeding are:**
   5.1. Hand expression of human milk into the infant's mouth
   5.2. Finger dipping
   5.3. Cup feeding

5.4. Tube feeding on finger or at breast/chest
5.5. Paced bottle and nipple feeding

6. Suggested supplement volumes when breast/chest feeding is inadequate:

6.1. 2–10 mL per feed (first 24 h)
6.2. 5–15 mL per feed (24–48 h)
6.3. 15–30 mL per feed (48–72 h)
6.4. 30–45 mL per feed (72–96 h)

Note:

- These volumes can be adjusted based on infant's clinical status (e.g. glucose level), cues (e.g. satiated), size, and growth (e.g. weight loss or gain).

7. Ongoing care to support feeding and manage poor weight gain:

7.1. Weigh pre feed, at 24 hours of age, and then daily. Be mindful of LPIs risk for hypothermia (i.e. place a prewarmed blanket on the scale).
  7.1.1. Weight loss > 3%/day or 7% by day 3 requires further evaluation and close monitoring.
7.2. Develop a feeding plan with the parents that can be easily implemented, communicated (to all care providers) and modified as needed.
7.3. Provide a dedicated lactation consultant whenever possible.
7.4. Minimize infant and birthing parent separation.
7.5. Develop a process to ensure appropriate assessment/reassessment of breast/chest feeding (i.e. RCP - Breastfeeding: Assessment and Discharge).
7.6. Reassess feeding daily, including milk supply, latch, suck/swallow/breathe coordination, and milk transfer (considering amount of stimulation required and duration of total feed including any supplements).
7.7. Consult a dietitian (if available) as early as possible with any concerns about significant weight loss or challenges with weight gain.
7.8. Assess number of wet diapers/voids per day.
  7.8.1. Day 1 to 4 – at least 1 per day of age
  7.8.2. Day 5 and on – at least 6/day
7.9. Assess number of soiled diapers/stools per day.
  7.9.1. Day 1 and 2 – at least 1-2
  7.9.2. Day 3 to 5 – at least 3

Hyperbilirubinemia

The following factors increase the LPI's risk of hyperbilirubinemia:

- immature gastrointestinal tracts and hepatic systems
- slower passage of meconium
- delay in bilirubin metabolism and excretion
- increased bilirubin load
- immature liver enzymes
- immature feeding - poor arousal and immature suck reflex leading to ineffective feeding and increased risk of dehydration and jaundice.

Additional risk factors for hyperbilirubinemia:

- visual jaundice before 24 hours of age
- bruising / cephalohematoma
- instrumental delivery (vacuum/forceps)
- sibling that required phototherapy / male gender
- birthing parent age greater than 25 years
- ABO incompatibility or other hemolytic disease
- East Asian or European race
- Dehydration / exclusive breast/chest feeding

1. **Assess adequacy of feeding, voiding, stooling, and visual degree of jaundice at each assessment.**
2. Obtain a total serum bilirubin (TSB) if clinical jaundice is present before 24 hours of age.
3. Obtain a TSB with the newborn metabolic screen between 24 and 36 hours of age.
   3.1. Plot the results on the nomogram supported by the CPS against the age of the infant at the time the specimen was obtained.
   3.2. Consider a repeat screen at 48-72 hours and on day 5-7 even if first value recommended routine care.
4. **LPIs peak serum bilirubin is between 5-7 days rather than 3-5 days for term infants and repeat testing may be required.**
5. Refer to RCP Routine Bilirubin Screening

   Note

   - LPIs have a higher incidence of kernicterus and up to 10-fold increase in risk for re-hospitalization for phototherapy.

Neurodevelopment

The LPI's immature brain can pose the following problems:

- apnea of prematurity and periodic breathing
- lack of coordination of suck/swallow/breath and the need to pace formula feeds
- sleepiness and the need to wake for feeds
- decreased tone - need for appropriate positioning to protect airway and support feeding

1. **The late preterm infant has an immature brain and central nervous system** and therefore, it is important to provide developmentally appropriate care based on infant's behavioral cues.
2. **The following strategies foster developmental care for the LPI:**
   - 2.1. Promote skin to skin contact
   - 2.2. Prevent overstimulation
     - 2.2.1. Cluster care when possible
     - 2.2.2. Avoid over-handling
     - 2.2.3. Ensure a quiet environment
     - 2.2.4. Reduce lighting in the room
3. **Manage procedural pain** as per local facility guidelines/policy.
   - 3.1. Skin-to-skin contact (SSC) with or without breast/chest feeding is the preferred method to diminish pain from minor procedures in infants
   - 3.2. Oral sucrose 24% may be required to ensure optimal pain management.

DISCHARGE CONSIDERATIONS

Late preterm infants (LPIs) are more likely than term infants to be readmitted for jaundice, feeding difficulties, dehydration, and suspected sepsis. The LPI should not be expected to meet appropriate discharge criteria before 72 hours of age or 36 weeks corrected age, however, **discharge should be based on clinical readiness of the LPI rather than by either gestational or chronological age**. The LPI should meet the following criteria prior to discharge:

1. Physical examination reveals no abnormalities that require continued hospitalization.
2. Medically stable and clinically well with no signs of sepsis.
3. Normal vital signs for at least 24 hours.

Feeding

1. An evaluation of feeding, including observation of position, latch, and milk transfer, has been completed and documented in the chart.
2. A feeding plan has been developed and understood by the family.

3. Infant had 24 – 48 hours of good quality feeding as demonstrated by:
   3.1. Ability to coordinate sucking, swallowing, and breathing while feeding
   3.2. At least 10 to 12 breast/chest feeds per day or 8-10 formula feeds by bottle per day or combinations of parent's milk with supplementation
   3.3. Adequate voiding and stooling patterns
   3.4. Acceptable weight graph - Weight loss that exceeds 7% of birth weight requires further assessment of the infant's feeding and nutritional status (e.g. evidence of dehydration), as well as demonstration of weight stabilization prior to discharge and close follow-up.

Screening

1. Metabolic and genetic screening tests have been performed. Repeat screening is required for infants weighing less than 2000 grams at birth or who are same-sex multiples. Refer to the Maritime Newborn Screening Program for more detail.
2. Other routine newborn screening as per local policy/guidelines.

Follow Up

1. A follow-up visit is scheduled within 24-48 hours of discharge.
   1.1 If the newborn care provider is not available, schedule a bridging assessment of the infant's feeding, weight, and colour with a qualified care provider.
   1.2 A complete assessment by the newborn care provider should be completed within 4-7 days of discharge.
2. Risk assessment for jaundice completed and additional follow up testing arranged, if required.
3. Referral to community resources, such as breast/chest feeding support, etc. if indicated.
4. Parents/caregiver demonstrate competency to care for and assess infant for hyperbilirubinemia, infection, feeding difficulties, and dehydration, and understand when and how to access care if required.

FAMILY EDUCATION FOR THE LATE PRETERM INFANT

General Information:

1. Provide family with written information on the LPI (for example Caring for your LPI)
2. Explain the differences between corrected gestational age and chronological age and that expectations for developmental milestone are based on corrected GA.
3. Explain the physiologic and metabolic immaturity of the LPI.

4. Review the importance of developmental care and skin-to-skin contact for optimal brain development. Developmental care for the LPI

5. Review behavioral cues:

Signs of stress and overstimulation:	**Signs of readiness for engagement:**
• limb extension, finger, or toe splaying • twitches or startles • arching or limpness • facial grimace or scowl • abrupt color changes • irregular breathing • gaze aversion • very sleepy • avoid eye contact when looked at or talked to • mottled skin • tremors in their arms or legs • easily stimulated	• limb flexion, relaxed fingers, and toes • smooth movements • rounded, flexed trunk and back • relaxed face and mouth • normal color • regular breathing • eyes open and engaged • quiet-alert state

6. Outline the anticipated hospital course.

7. Explain the expectations for discharge and follow up.

8. Review the potential complications that require close monitoring and how to recognize the signs and symptoms:

Respiratory distress and **apnea** and when to call for immediate assistance.

□ Discuss the importance of SSC to reduce stress and optimize respiratory status.

□ Review infant positioning during SSC and monitor for signs of respiratory distress or airway obstruction.

Infection/sepsis and when to call healthcare provider.

□ Review home infection control and discuss ways to reduce infection:

- Proper handwashing
- Limit visitors, avoid crowds, etc.
- Protect against contact with sick people
- Exclusive breast/chest feeding for up to two years of age or beyond

Hypothermia and how to take infant's temperature.

□ Review the benefits of SSC and discuss ways to maintain a neutral thermal environment:

- Maintain SSC as much as possible
- Provide appropriate clothing when not in SSC
- Keep infant away from drafts and ensure room temperature is warm
- Prevent hyperthermia and do not overdress the infant

- Ensure family has Pamphlet: A Parent's Guide to SSC

Hypoglycemia and when to contact health care provider.

- Parent Information Blood Glucose

Hyperbilirubinemia and kernicterus and when to contact health care provider.

- Jaundice in newborns Caring for kids (cps.ca)

Review the following with the family/caregivers:

1. LPIs' increased risk for sudden unexpected death in infancy (SUDI)
2. Safe vs unsafe sleeping practices (back to sleep)
3. Hazards of second-hand smoke.
4. Car seat safety and why babies should only be placed in a car seat for travel in a moving vehicle and removed promptly once the destination is reached.
5. Ensure family can demonstrate appropriate use of their car seat prior to discharge.
6. General newborn care and issues specific to LPIs –
   - bathing and diaper changes
   - caring for umbilical cord
   - value of SSC
   - need for increased clothing when not in SSC.
7. Expected urine and stool frequency (breastfed or formula fed).
8. How to recognize:

Signs of illness and **when to call health care provider or 811**		**Life threatening events** and when to **call 911**
• fever, hypothermia • lethargy • poor skin colour • decreased urine output • abdominal distension	• vomiting • bloody stool • inconsolable infant • unsure about the severity of infant's symptoms	• apnea • choking • difficulty breathing • cyanosis

Feeding:

1. Describe infant feeding cues:
   - Stirs, makes small movements
   - Opens mouth

- Roots towards an object
- Turns the head from side to side
- Opens eyes – increased rapid eye movements
- Stretches
- Move arms and legs
- Brings hands towards mouth

Note: Crying is a late sign of hunger and LPIs may be frustrated, unable to latch, and needlessly use energy.

2. Explain the importance of exclusive breast/chest feeding for providing immune protection and nutrition, as well as the parent's benefits to breast/chest feeding.

Breast/chest fed infants have decreased risk of:	**Parents who breast/chest fed have decreased risk of:**
• infection • SUDI • obesity • asthma • diabetes • diarrhea • childhood cancers	• breast and ovarian cancer • stress/anxiety • diabetes • cardiovascular disease • post-partum hemorrhage • osteoporosis

3. Explain that parent's milk is gestationally appropriate and designed to meet their infant's nutritional needs.

4. Review the importance of building milk production concurrently with breast/chest feeding initiation and progression.

5. Encourage hand expression and/or use a double electric pump after breast/chest feeding to ensure thorough breast/chest emptying and promote lactogenesis progression and milk production.

6. Describe the LPI's stomach size and the importance of frequent, small volume feedings to ensure at least 10-12 breastfeeds or 8-10 formulas feeds per day.

7. Explain that LPIs tend to feed slower, may have problems initiating or maintaining breast/chest feeding, and require extra support. Reassure that these issues are related to immaturity and will improve as the infant approaches term gestational age.

8. Explain breast/chest feeding positions for the LPI to compensate for hypotonia and prevent positional apnea.

9. Review duration of feeds, early feeding cues, breast/chest compressions, etc.

10. Explain when and why supplementation with human milk or infant formula may be required and the various options, methods, and volumes.

11. Describe appropriate milk storage.

12. Review formula preparation and storage (if applicable).

13. Explain why the LPI should not have powdered milk. Infant formula: What You Need to Know

14. Review signs of dehydration and encourage tracking voids and stools to determine adequate intake.

15. Explain vitamin D supplementation and rationale (Vitamin D deficiency is widespread and increases risk of rickets in infants).

16. Emphasize the importance of adequate feeding and follow up within 24 to 48 hours of discharge.

Family Resources:

Available community resources and support services, if indicated

- Public Health - 902-481-5800
- Breastfeeding Support Drop-in Single Parents Centre - 902-479-0508

Other resources, such as:

- La Lèche League Canada https://www.lllc.ca/
- Parents of Multiple Birth Association (POMBA) http://www.pomba.ca/
- Breastfeeding Basics https://novascotia.ca/dhw/healthy-development/documents/Breastfeeding-Basics.pdf
- Loving Care birth to 6 months http://www.nshealth.ca/sites/nshealth.ca/files/patientinformation/09045.pdf
- Postpartum https://novascotia.ca/dhw/healthy-development/postpartum-postnatal.asp
- Family Resource Centres https://novascotia.ca/coms/families/prevention-and-early-intervention/family-resource-centres.html
- Nova Scotia 211 http://ns.211.ca/
- Healthy eating when pregnant and breast/chest feeding https://food-guide.canada.ca/en/tips-for-healthy-eating/pregnant-breastfeeding/
- Health Link BC https://www.healthlinkbc.ca/health-topics/hw130509
- RCP Postpartum and Postnatal Care Resources http://rcp.nshealth.ca/resources-reports/nova-scotia-postpartum-postnatal-care-resources

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APPENDIX A - Definitions

Gestational Age (GA) - the estimated age of a fetus expressed in weeks.

Chest feeding - the process of feeding a child human milk from a person's chest. It is a term that can be used by anyone, but often is used by transgender and nonbinary people.

Sepsis - neonatal sepsis is defined as a systemic condition of bacterial, viral, or fungal (yeast) origin that is associated with hemodynamic changes and other clinical manifestations and can result in substantial morbidity and mortality.

Hypothermia - axilla temperature less than 36.5 degrees Celsius

Hyperbilirubinemia is increased bilirubin levels in the blood beyond normal range for age. Hyperbilirubinemia or jaundice is a common neonatal condition, occurring in approximately 80% of newborn infants. Bilirubin is a by-product of red blood cells, which are produced at an increased rate and have a decreased life span in the newborn period. Bilirubin levels generally peak on days 3-5 of life in full-term infants and days 5-7 in late preterm infants.

Trauma Informed care – a universal, systematic approach that is grounded in an understanding of, and responsiveness to, the impact of trauma. Creating safe spaces is about acknowledging trauma, building welcoming and safe environments, and promoting trust and respect in our daily interactions. Being trauma informed is about using the principles of trauma informed care to create:

1. Safety and trustworthiness through our practices
2. Safe physical and emotional environments
3. Positive social interactions with clients, families, staff, volunteers, and physicians

APPENDIX B –Hypothermia Management of the Newborn [1]

1. If the newborn's temperature is abnormal at any time:
- 1.1. Trouble shoot equipment (i.e. obtain a second thermometer, adjust radiant warmer temperature, etc.) and ensure proper technique for obtaining axilla temperature is performed.
- 1.2. Assess maternal temperature if newborn is skin to skin. If maternal temperature is abnormal use interventions to modify maternal temperature or consider placing newborn skin to skin with support person.

2. If the newborn's axillary temperature is less than 36.5°C perform the following interventions:
- 2.1. Increase room temperature to 25 °C.
- 2.2. If newborn is skin to skin, assess maternal temperature.
- 2.3. If not already, the newborn should be placed and kept skin to skin according to policy.
- 2.4. Cover the newborn with a warm blanket while skin to skin
- 2.5. A hat should be placed on the newborn's head (if not already done)
- 2.6. Ensure the newborn is not near a draft
- 2.7. Ensure that the newborn is fed, including hand expressed colostrum if not interested in feeding
- 2.8. Explain the importance of these interventions to the newborn's care giver
- 2.9. Reassess within 30 minutes to ensure all the interventions are still in place
- 2.10. Reassess the newborn's clinical status and recheck the newborn's VS within one hour

3. On reassessment if the temperature is improving:
- 3.1. maintain interventions to achieve normothermia
- 3.2. reassess temperature hourly until two consecutive normal temperatures

4. On reassessment the temperature remains the same or lower:
- 4.1. reassess interventions
- 4.2. consider clinical status
- 4.3. contact the attending newborn care provider to establish plan of care

5. If the newborn's temperature is less than 36 °C:
- 5.1. Notify the attending newborn care provider of the newborn's temperature and overall clinical status and obtain patient specific orders.
- 5.2. Place the baby in a preheated incubator

[1] Reference: IWK Policy # 4545 (2019) Temperature Management of the Newborn

APPENDIX C - Infant feeding cues[2]

Signs infant may show to indicate readiness to feed or the need to have a break or stop feeding

Engagement Cues:

- ✓ Holding their hands or fist over their chest
- ✓ Sucking on their hands and/or fingers
- ✓ Turning towards your body with an open mouth
- ✓ Smacking of their lips
- ✓ Sticking out their tongue
- ✓ Making sucking sounds
- ✓ Increasing body movements
- ✓ Licking
- ✓ Rooting
- ✓ Stretching
- ✓ Crying

Disengagement Cues:

- ✓ Turning away
- ✓ Closing their mouth
- ✓ Their hands and arms are relaxed
- ✓ Falling asleep
- ✓ Changes in sucking pattern or strength
- ✓ Sneezing
- ✓ Hiccups
- ✓ Tongue to roof of mouth
- ✓ Crying
- ✓ Skin Color Changes
- ✓ Arching Back
- ✓ Panicked or Worried Look
- ✓ Finger Splaying
- ✓ Flailing Movements
- ✓ Tremors or Jittery Movements
- ✓ Irritability
- ✓ Stop hand
- ✓ Gagging
- ✓ Changes in Vital Signs: Heart Rate, Oxygen Level, Breathing Rate

[2] Reference: IWK policy # 8709 (2018). Cue-Based Feeding Guidelines. Retrieved from: Cue-based feeding