



Caring for the Late Preterm Infant

A Clinical Practice Guideline

Late Preterm Infants, those born between 34^{0/7} weeks and 36^{6/7} weeks, often appear outwardly similar to and are treated like full term infants. However, research has shown that they often have some of the same medical issues as early preterm infants, including feeding issues, breathing issues and developmental delays. This guide provides medical practitioners with the tools necessary to manage these often fragile infants.

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Hospital Management of Late Preterm Infant

Challenges	Assessments	Management
1. Preterm Birth	Gestational age assessment	<p>On admission, determine accurate gestational age (GA) using the obstetrical estimate of GA, if it is based on first trimester ultrasound.</p> <ul style="list-style-type: none">• If first trimester ultrasound is not available, use the GA based on the newborn exam.• Use GA based on Last Menstrual Period (LMP) as last resort. This is the least accurate method.
2. General	<p>Assessment at least once a shift by an RN.</p> <p>Assessment daily by designated primary health care provider.</p>	Use hospital form to document physical assessment findings.
3. Vital Signs	<p>Temperature, apical pulse, respiratory rate (TPR) on admission then every hour x3, and then every 3-4 hours if stable until discharge.</p> <p>On admission & discharge, blood pressure and pulse oximetry.</p>	Manage unexpected findings per hospital protocol.

Challenges	Assessments	Management
4. Respiratory Distress	<p>Monitor respiratory rate and observe for nasal flaring, grunting, retractions, cyanosis (central or circumoral), with vital signs and with feedings and assessments.</p> <p>If any of the above present, assess pulse oximetry.</p>	<p>If respiratory rate >60 breaths per minute, consider holding feeding and evaluate for alternative feeding method. If pulse oximetry reading <90%, notify Primary Care Provider and consider oxygen supplementation.</p> <p>If pattern persists, refer or consult with next level perinatal provider.</p> <p>Airway safety management:</p> <ul style="list-style-type: none"> • Car seat safety test • Back to Sleep protocol
5. Recurrent Apnea	<p>Assess duration, frequency, need for and extent of required stimulation.</p> <p>With each event, assess heart rate and oxygen saturation.</p> <p>Primary Apnea: when a fetus/newborn becomes deprived of oxygen, an initial period of attempted rapid breathing is followed by a cessation of breathing and dropping heart rate that responds to stimulation (<i>Neonatal Resuscitation Program</i> definition).</p> <p>Secondary Apnea: if oxygen deprivation continues, deep gasping respirations develop, the heart rate continues to decrease, and the blood pressure decreases. Secondary apnea does not respond to tactile stimulation; positive pressure ventilation must be provided (<i>Neonatal Resuscitation Program</i> definition)</p>	<p>If heart rate less than expected and/or oxygen saturation < 90%, follow hospital protocol.</p> <p>If indicated, draw blood for serum glucose, complete blood count (CBC) and/or blood gas.</p> <p>Consult with next level perinatal care provider.</p>

Challenges	Assessments	Management
<p>6. Thermoregulation</p>	<p>Temperature on admission then every hour x3 after birth, then every 3-4 hours or with feedings.</p> <p>Re-check temperature within 30-60 minutes after intervention.</p>	<p>Prevent Heat Loss:</p> <ul style="list-style-type: none"> • Place hat on infant. • Consider increasing ambient temperature and avoid drafts. • Delay bath until temperature stable. • Maintain skin-to-skin contact as much as possible. <p>If temperature <36.3 C. (97.6 F), provide measures to warm the infant.</p> <ul style="list-style-type: none"> • Initiate skin-to-skin contact with mother (baby in diaper, placed next to mother's skin). • Warm blanket over mother and baby. • If needed, place baby in incubator or radiant warmer with skin temperature probe in place. • Check serum glucose. <p>Suspect sepsis if baby is consistently unable to maintain appropriate temperature.</p>
<p>7. Hypoglycemia</p>	<p>If history of maternal diabetes, implement Infant of Diabetic Mother hospital protocol.</p> <p>Assess serum glucose checks hourly x3 after birth, then prior to feedings x2.</p>	<p>Initiate early feeding (within one hour of birth).</p> <p>Maintain serum glucose >45mg/dl.</p> <p>See Appendix A: Hypoglycemia resource</p>

Challenges	Assessments	Management
<p>8. Jaundice</p>	<p>Obtain transcutaneous or total serum bilirubin levels at 24 hours of age.</p> <p>If clinical jaundice present at <24 hours, consider early bilirubin measurement.</p>	<p>For prevention of hyperbilirubinemia, emphasize early and frequent breast feeding.</p> <p>For infants 35 weeks gestation and greater, follow American Academy of Pediatrics guidelines for hyperbilirubinemia. (See Appendix B)</p> <p>For infants < 35 weeks gestation consult next level perinatal care provider.</p> <p>For infants discharged prior to 72 hours of age, arrange for bilirubin testing within 48 hours of discharge.</p> <p>Provide parents with written and verbal information about jaundice. (Included in the family education component.)</p>

Challenges	Assessments	Management
<p>9. Sepsis</p>	<p>Assess for maternal risk factors associated with sepsis:</p> <ul style="list-style-type: none"> • Maternal Group B Strep positive or unknown (If positive or unknown, check if mother received at least one dose of ampicillin, penicillin, or cefazolin at least 4 hours before delivery. If not, consider treating baby with antibiotics per protocol or recommendation of perinatal care provider.) • Maternal temperature during labor $\geq 38.0^{\circ}\text{C}$ • Prolonged rupture of membranes (≥ 18 hours before delivery) • Maternal cold or flu-like symptoms • Maternal recent urinary tract infections <p>Prematurity: <37 weeks gestation</p> <p>Assess for Infant Risk Factors</p> <ul style="list-style-type: none"> • Loss of skin integrity • Instrumentation at birth including endotracheal intubation, forcep delivery <p>Assess Infant for Signs of Sepsis:</p> <ul style="list-style-type: none"> • Signs of respiratory distress • Feeding problems/abdominal distension/vomiting • Temperature instability • Apnea • Lethargy • Pale, mottled or cyanotic color • Hypoglycemia 	<p>Prevention of Sepsis:</p> <ul style="list-style-type: none"> • Adequate hand washing • Consider health screening for family and visitors. <p>If sepsis is suspected, consider obtaining a CBC and blood culture and begin antibiotics promptly. Consult next level perinatal care provider.</p> <p>Document presence or absence of risk factors.</p>

Challenges	Assessments	Management
<p>10. Feedings/ Nutrition</p>	<p>Screen serum glucose per protocol (See Appendix A. Hypoglycemia resources).</p> <p>Assess coordination of suck, swallow, and breathing at least once a shift.</p> <p>Assess urine output and stooling pattern each shift.</p> <p>Weigh at least once every day, preferably at approximately the same time each day.</p> <p>Calculate % of weight loss since birth.</p> <p>Assess feeding cues</p> <ul style="list-style-type: none"> • Increased rapid eye movements • Wide-open eyes – looking about • Baby moves head back and forth • Arms and legs begin to wiggle • Mouth opens in searching behaviors • Active rooting and sucking • Crying is a late hunger cue (Baby cannot concentrate, this will lead to latch difficulty and breast refusal) 	<p>Initiate early feedings (preferably within 1 hour after birth) to stabilize blood glucose and to stimulate stooling.</p> <p>If weight loss > 3% of birth weight by day 1 or >7% by day 3:</p> <ul style="list-style-type: none"> • Explore possible causes such as hypoglycemia, jaundice, sepsis, or ineffective milk transfer. See each section for management. • Begin additional supplemental feedings. • Reassess maternal and infant feeding behaviors. If needed, instruct mother about ways to increase infant intake. • For breastfeeding babies obtain another lactation consult. <p>Establish a feeding plan: (see Appendix C: Breastfeeding the Late Preterm Infant)</p> <ul style="list-style-type: none"> • Offer breast whenever infant shows feeding cues. • Offer breast every 2-3 hours to encourage milk let-down, if infant does not show feeding cues within that time frame. • Initiate use of breast pump or manual expression within 4 – 6 hours of birth. • Assist mother to obtain pump for home use. Pumping after each feeding may help increase maternal milk supply. • Supplement with expressed breast milk or formula: 5-10 mL per feeding on 1st day, then 10-30 mL per feeding. Use cup or finger feedings whenever possible.

Challenges	Assessments	Management
Feedings/ Nutrition Continued	<p>Breastfeeding babies (see Appendix C: Breastfeeding the Late Preterm Infant)</p> <ul style="list-style-type: none"> • Evaluate feeding behaviors at least once per shift using a standardized tool such as LATCH. (See Appendix F for LATCH Tool) • Evaluation by lactation consultant or phone consultation via MILK Line (1-877-271-MILK) within 24 hours of birth. <p>Bottle-feeding babies Assess adequacy of suck, swallow and breathing coordination.</p>	<p><u>For Bottle Fed Babies</u> Offer formula whenever infant shows feeding cues or at least every 3 hours.</p> <p>Consider use of premature nipple for increased flow.</p> <p>Utilize chin support and cheek support to aid in adequate suction.</p> <p>Consider more upright position for feedings.</p> <p>Suggest frequent burping of the infant.</p>
11. Parent-Infant Attachment	<ul style="list-style-type: none"> • Family, environmental and social risk factors • Early signs of attachment • Infant’s ability to demonstrate cues • Parent and child interaction cues <p>(See Appendix E for Developmental Support and Infant Cues)</p>	<ul style="list-style-type: none"> • Refer as indicated to locally available resources. • Teach parents about infant behaviors and cues. • Encourage skin-to-skin contact whenever possible.
12. Development Support	Assess for parental knowledge of infant development and cues.	(See Appendix E for Developmental Support and Infant Cues)
13. Newborn Screening	The Oklahoma State Department of Health recommends obtaining newborn screens at 24 hours of age and at 14 days of life.	If the infant is discharged at 10-12 days of life, the Newborn Screen should be drawn prior to discharge to ensure a second screen is obtained.

Challenges	Assessments	Management
<p>14. Health Promotion/ Disease Prevention</p>	<p>Assess for risk factors associated with re-hospitalization, such as:</p> <ul style="list-style-type: none"> • Feeding difficulties • Poor weight gain • Jaundice • Dehydration (increased risk with exclusive breastfeeding, first time mother, maternal age \geq 35 or infant born by c-section, discharged prior to 48 hours) • Apnea • Signs of respiratory distress • Signs of infection <p>Assess need for home health services, weight checks within the first week of discharge.</p> <p>Assess need for referral of services for families who smoke.</p> <p>Assess need for developmental follow up services.</p>	<ul style="list-style-type: none"> • Document presence or absence of risk factors. • Complete discharge checklist. • Document that all discharge plans are in place prior to discharge. • All LPT infants should be seen by primary care provider within 48 hours of discharge. • Teach parents health promotion: <ul style="list-style-type: none"> • Hand washing by all who come into contact with infant. • Avoiding crowds. • Keeping people who are sick away from baby. • Keep away from smokers. • Follow up with lactation consultant (provide families with the 1-877-271-MILK 24 hour breastfeeding hotline.) • Follow guidelines for Respiratory Syncytial Virus, immunization based on risk factors. (See Appendix D: Respiratory Syncytial Virus) • Home health referral for weight checks, lactation support. • Refer for smoking cessation services and importance of no smoking in the house. (1-800-QuitNow) to reduce second hand exposure. • Refer for services by Sooner Start Guidelines. • Encourage developmental testing at 16 and 24 months.

Education Plan (Discharge Checklist)

Nursing Policies/Routines:

- Late Preterm
- Environment
- Visitation
- Equipment

Plan of Care, Diagnosis, Tests:

- Rule out sepsis-antibiotics
- Jaundice, phototherapy
- Low blood sugar, glucose testing
- Skin/umbilical cord care
- Temperature taking
- Signs/symptoms of illness
- Other

Safety Plan:

- Car Seat Challenge
- CPR
- Safe Sleep Position
- Other

Immunizations:

- Vaccine Information Statement given
- Questions answered, consent obtained prior to vaccination
- Immunization record and registry info given
- RSV Assessment (See Appendix D: Respiratory Syncytial Virus)
Y/N Date First Dose Given: _____

Newborn Metabolic/Genetic/Hearing Screen:

- Education
- Metabolic/Genetic Date: _____ Time: _____ Kit: _____
Date: _____ Time: _____ Kit: _____

Discharge:

- Home health needed Y/N
If yes, date ordered: _____ Visit Scheduled: _____
Home Address Confirmed: _____
- Pediatric Check-Up Scheduled: _____
- Follow-up with _____ in _____ days
(include recommended days for follow up ie. within 48 hrs of discharge)

Appendix A: Hypoglycemia Resources

1. Intermountain Healthcare. Guidelines for Management of Neonatal Hypoglycemia. (2010) Retrieved March 15, 2010, from <https://kr.ihc.com/ext/Dcmnt?ncid=51072065>.
2. The Academy of Breastfeeding Medicine. (2006) Protocol #1: Guidelines for Glucose Monitoring and Treatment of Hypoglycemia in Breastfed Neonates. Retrieved March 15, 2010, from <http://www.bfmed.org/Resources/Protocols.aspx>.
3. The Barbara Bush Children's Hospital at Maine Medical Center. (2007) Newborn Hypoglycemia General Information, Clinical Algorithm, IV Glucose Weaning Algorithm, Feeding Algorithm. Retrieved March 15, 2010 from http://www.mainehealth.org/mmc_body.cfm?id=606.
4. University of California at San Francisco Children's Hospital at UCSF Medical Center. (2004). Neonatal Hypoglycemia. Retrieved March 15, 2010 from http://www.ucsfchildrenshospital.org/pdf/manuals/52_Hypoglycemia.pdf

Appendix B: Hyperbilirubinemia Resources

1. American Academy of Pediatrics (2004). Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. <http://aappolicy.aappublications.org/cgi/reprint/pediatrics;114/1/297>

Appendix C: Breastfeeding the Late Preterm Infant

1. California Perinatal Quality Care Collaborative. Care and management of the late preterm infant toolkit: Nutrition. Retrieved September 1, 2010, from http://www.cpgcc.org/quality_improvement/qi_toolkits/care_and_management_of_the_late_preterm_infant_toolkit_rev_april_2007.
2. The Academy of Breastfeeding Medicine. Protocol #10: Breastfeeding the near-term infant (35 to 37 weeks gestation). Retrieved September 1, 2010, from www.bfmed.org/Resources/Download.aspx?Filename=Protocol_10.pdf
3. Coalition of Oklahoma Breastfeeding Advocates (2009). Model Hospital Policy on Breastfeeding. Retrieved May 25, 2010 <http://www.ok.gov/health/documents/mch-prh-Model%20Breastfeeding%20Policy.pdf>.
4. Walker, M. (2008). Breastfeeding the late preterm infant. *Journal of Obstetric, Gynecologic and Neonatal Nurses*. 37(6), 692-701.

Appendix D: Respiratory Syncytial Virus

1. National Perinatal Association. (2010) Respiratory Syncytial Virus (RSV) Prevention 2010. Retrieved May 25, 2010 from <http://www.nationalperinatal.org/advocacy/pdf/Respiratory-Syncytial-Virus-Prevention-2010.pdf>
2. American Academy of Pediatrics. (2009) Modified Recommendations for Use of Palivizumab for Prevention of Respiratory Syncytial Virus Infections 2009. Retrieved September 1, 2010 from <http://aapredbook.aappublications.org/news/RSVPolicy-082409.pdf>
3. State of Oklahoma, Oklahoma Health Care Authority (2009) Petition for Synagis Authorization. Retrieved September 1, 2010 from <http://www.okhca.org/providers.aspx?id=1160&terms=Petition+for+Synagis+Authorization> (An updated version will be available October 1, 2010)

Appendix E: Developmental Support and Infant Cues

Assessment	Intervention
<p><u>PHYSIOLOGICAL BEHAVIORS</u></p> <p>Organized</p> <ul style="list-style-type: none"> • Stable breathing, heart rate, color; no gagging, spitting up, bowel straining, or hiccupping <p>Disorganized</p> <ul style="list-style-type: none"> • Very fast or slow breathing or pauses in breathing • Skin color that is pale (white), dusky (purple dark), red or covered with blotches • Startles, twitches or tremors • Coughing, gasping, sighing, sneezing, yawning <p>Ready to interact</p> <ul style="list-style-type: none"> • Color – pink in face, body and extremities with no changes • Breathing – smooth and regular • Gastrointestinal – digestion stable with burping, regular elimination patterns • Needs a break • Cough • Breathing – irregular • Gasp • Startle – sudden movement of arms and legs away from body • Tremor – quivering of whole body or part of body • Twitch – sudden, brief contraction • Sneeze 	<p>Sensitive to environmental and social stimuli leading to increased fatigue.</p> <p>Prevent overstimulation and exhaustion by reducing excessive light, sound and handling by multiple caregivers.</p> <p>Support calm, predictable and familiar daily routines consisting of low-key events to prevent fatigue, exhaustion and irritability in the hospital and at home.</p> <p>Support consistent caregivers, i.e. parents are best facilitated by consistent medical care team while limiting numbers of unfamiliar caregivers.</p> <p>Less energy for motor based self-regulation</p> <p>Provide containment and physical boundaries in the absence of parents.</p> <p>Encourage parents to hand swaddle and participate in skin to skin holding as early and as often as possible.</p> <p>Briefer, less robust orientation for attention and social interaction.</p> <p>A low-key, calm and slow approach to interaction that is matched to infant behavior cues.</p> <p>Infant behavioral cue-based socialization and support of infant’s emerging participation in attachment promoting interactions.</p> <p>Difficulty self-consoling and self-calming</p> <p>Facilitate emerging self-calming skills by encouraging behaviors such as bringing hands to face and mouth, sucking a pacifier, tucking arms and legs close to body.</p>

Assessment

Motor Behaviors

- *Ready to interact* – flexed and relaxed
 - **Tone** – lies in a softly tucked position with arms, legs and trunk softly bent
 - **Posture** – stays flexed and relaxed with arms and legs tucked in close to body, hands near face
 - **Movements** – arms, legs and face move in fluid motion and stay close to body
- *Needs a break*
 - **Tone** – any part of the body is stiff, rigid, flaccid or limp
 - **Posture**
 - Arms salute (extends elbow and flexes shoulder usually with extended fingers)
 - Sitting on air (knees and legs are extended and hips flexed)
 - Toe splay (toes extended and open)
 - Finger splay (fingers extended and open)
 - Fisting (hands flexed to form a fist)
 - High arm position (arms extended over head, forearm may be across the face)
 - **Movements**
 - Squirm
 - Jerky
 - Gape Face (mouth open, looks exhausted)
 - Tongue extension
 - Arching of back

Intervention

Less energy for feedings

Facilitate energy for successful feeding by

- Encouraging hands to face
- Loosely swaddle in a soft blanket with arms and legs tucked
- Providing a calm and quiet environment

Breastfeeding with soothing closeness may be more supportive and effective than bottle feeding by many caregivers.

Assessment

State Behaviors

Sleep and awake cycles

Organized

- *Calm alert* – regular breathing with little or no body movements, bright look
- *Alert and focused* – regular breathing, eyes open, ready for interaction
- *Fussy* – active and awake, restless movement, not crying
- *Crying* – eyes open or closed, irregular breathing, crying is present
- *Deep sleep* – regular breathing, relaxed face with no spontaneous movements
- *Active sleep* – irregular breathing, eyes closed or partly open, rapid eye movements, mild sucking may be seen
- *Drowsy sleep* – irregular breathing, eyes open or closed, some movement

Assessment

Disorganized

- *Hypo-alert* – eyes slightly open, looks tired, quiet with little movement
- *Hyper-alert* – quiet with eyes wide open looking scared, intensely focusing
- *Gaze Averting* – looks away from a face or object
- *Fussy and Crying*
- *Upward Gaze* – looks up over an object in front of face
- *Staring* – eyes glazed or fixed, appears to be staring
- *Grimace*

Appendix F: LATCH Breastfeeding Assessment

JensonD, Wallace S, Kelsay P (1994). LATCH: A breastfeeding charting system and documentation tool. JOGNN, 23(1):29

	0	1	2	Totals
L Latch	Too sleepy or reluctant No sustained latch or suck achieved	Repeated attempts for sustained latch or suck Hold nipple in mouth Stimulate to suck	Grasps breast Tongue down Lips flanged Rhythmical Sucking	
A Audible Swallowing	None	A few with stimulation	Spontaneous and intermittent (< 24 hours old) Spontaneous and frequent (> 24 hours old)	
T Type of Nipple	Inverted	Flat	Everted (After stimulation)	
C Comfort (Breast/nipple)	Engorged Cracked, bleeding, large blisters or bruises Severe discomfort	Filling Reddened/small Blisters or bruises	Soft Non-tender	
H Hold (Positioning)	Full assist (Staff holds infant at breast)	Minimal assist (i.e. elevate head, place pillows for support) Teach one side, mother does other Staff holds and then mother takes over	No assist from staff Mother able to position and hold infant	

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To learn more about the Oklahoma Infant Alliance visit www.oklahomainfantalliance.org

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The Oklahoma Infant Alliance is a statewide initiative coordinated by the

