



Care Process Model

Healthy Newborns



WHAT IS A CARE PROCESS MODEL (CPM)?

Care process models strive to ensure that all care delivered by the health system, regardless of a patient's location in the continuum, is medically necessary, the leading edge in medical science, and the appropriate treatment intensity. Put into effect, these models will systematize treatment processes across all hospitals and practices, improving consistency as well as effectiveness.

This CPM summarizes Mission Health's multidisciplinary care of healthy newborns.

WHAT IS MULTIDISCIPLINARY CARE?

Multidisciplinary care is agreed-upon, interdisciplinary, patient-centered, disease-focused, care delivery systems that are informed by a series of evidence-based care process models. Multidisciplinary care supports the achievement of the BIG(GER) Aim systematically across the continuum of care.

WHAT ARE THE BENEFITS OF A CPM?

- Reduces variation
- Utilizes the best practice from literature and expert opinion
- Improves care delivery repetition
- More readily exposes errors
- Variation study informs revisions to CPMs

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BIRTH TO 12 HOURS

- Infant dried and stimulated. Assessment and resuscitation in accordance with AHA and AAP NRP program
- Place infant skin-to-skin on mother's chest
- APGAR scoring assigned at 1 min & 5 min of birth
- For safety and security, infant is banded for verification of identification with infant security device

- Administration of erythromycin eye ointment and IM vitamin K within 1 hr of birth
- Breast fed infants are fed within 1 hour of birth. Formula fed infants should be fed within 2 hrs of birth
- Hypoglycemia and drug testing for at-risk infants
- Vitals signs obtained every 30 min until infant is stable for 2 hrs

- Umbilical cord is kept clean and dry (dry cord care is provided throughout stay)
- Hepatitis B vaccine administered
- Infant is fed based on feeding cues
- Discharge planner consult as needed per assessment of social risk factors

12 HOURS TO DISCHARGE

- Modeling and education of safe sleep practices: back to sleep, no co-sleeping, use of sleep sacks, etc.
- Education on Period of Purple Crying
- Hearing screening performed
- Initial bath completed once temperature stability is ensured

- Congenital Heart Disease Screening performed at 24 hrs of age
- Newborn screening obtained after 24 hrs of age
- Serum bilirubin drawn after 24 hrs of age
- Car seat challenge testing for at risk infants

- Ensure follow up appointment within 96 hrs of discharge
- Mother's knowledge, ability, and confidence to provide adequate care for her infant are documented
- Thorough discharge instructions provided

KEY FEATURES OF MULTIDISCIPLINARY CARE OF HEALTHY NEWBORNS

- **Feeding**—Breastfeeding mothers should be given clear verbal and written discharge instructions, including information on hunger and feeding indicators, stool and urine patterns, jaundice, proper positioning and attachment of the baby to the breast, and techniques for expressing breast milk. Parents who choose to bottle-feed their newborn should be taught appropriate formula feeding techniques including: feeding on cue, eye-to-eye contact, and holding the baby closely. There is documentation that the infant has completed at least 2 successful feedings.
- **Elimination**—Infant should urinate and pass at least one stool spontaneously. Meconium is typically passed within the first 24 hrs after birth. If a term newborn has not passed meconium by 48 hrs, the lower gastrointestinal tract may be obstructed. Urine is normally passed within the first 12 hrs after birth. Failure to void within the first 24 hrs may indicate genitourinary obstruction or abnormality.
- **Preventative Care**
 - Administration of Vitamin K and Erythromycin ointment
 - Maternal and infant blood test results are available and have been reviewed, including: maternal syphilis and hepatitis B surface antigen status; cord/infant blood type and direct Coombs test results, as clinically indicated; and screening tests performed in accordance with state regulations, including screening for human immunodeficiency virus infection
 - Drug screening as indicated per mother's or newborn's risk factors
 - Glucose homeostasis screening as indicated
 - Newborn metabolic screening
 - Critical Congenital Heart Disease screening
 - Hearing screening has been completed
 - The clinical significance of jaundice has been determined and appropriate management and/or follow-up plans have been put in place
 - Physicians screen all newborns for developmental dysplasia of the hip by physical exam/identification of risk factors
- **Immunizations**—Evolving data demonstrates both maternal and neonatal protection against an increasing number of aggressive newborn pathogens through the use of maternal immunization programs, suggesting pregnancy is an optimal time to immunize for disease prevention in both mothers and newborns.

IMPORTANT NOTE:

All efforts of assuring evidence-based, quality improvement-based guidelines have been employed in creating this document.

However, these criteria are meant to be used as guidelines only and not intended to be a standard of care or best practices.

The patient's clinical condition may merit alterations in the treatment algorithms or recommendations.

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- Maternal immunity is the only effective strategy for influenza protection in newborns because the vaccine is not approved for use in infants younger than 6 months
- If not administered during pregnancy, Tdap should be administered postpartum to ensure pertussis immunity and reduce the risk of transmission to the newborn
- **Parent Education and their Involvement**—The parent’s knowledge, ability, and confidence to provide adequate care for their infant are documented. They will receive training on the following: breastfeeding or bottlefeeding; appropriate urination and defecation frequency for the infant; dry cord, skin, and genital care for the infant; infant safety, such as safe sleep practices; ability to safely obtain a rectal temperature on the infant; and ability to recognize signs of illness and common infant problems.
- **Safety**—The members of the health care team at Mission Health support and encourage family-centered perinatal care and recognize the potential for family growth and development through the birth experience.
 - In keeping our patients and infants safe, anyone wishing to visit the newborn couplet should be free of communicable diseases and/or viruses; parents and nursing staff will encourage family and friends to perform hand hygiene upon entering the room and before handling the newborn
 - To promote a period of rest and bonding, a designated “Quiet Time” will be provided
 - Caregivers will watch the “Period of Purple Crying” prior to discharge and be given a DVD to take home to share with other caregivers
 - The risk of infant abduction is minimized by policies that include educating staff about the risk factors for abduction, educating families about safe procedures for handing over their infant, and controlling access to the postpartum area
 - Safe infant sleep is implemented and modeled during the hospital stay, including:
 - back (supine) to sleep for every sleep
 - use of a firm sleep surface
 - room sharing without bed sharing
 - use of sleep sack wearable blankets
 - education regarding avoidance of commercial devices that are marketed for prevention of SIDS, such as wedges and positioners
 - education regarding avoidance of smoke exposure, alcohol, and illicit drug use
 - recommendation of breastfeeding
 - all child care providers will receive education on safe infant sleep
- **Discharge of Healthy Newborns**
 - The infant’s vital signs are documented to be within normal ranges and stable for 12 hrs prior to discharge. This includes a respiratory rate below 60 per minute, a heart rate of 100 to 160 beats per minute, and an axillary temperature of 36.5°C (97.7°F to 99.3°F)
 - Family, environmental, social risk factors, and barriers to adequate follow-up care have been assessed
 - A physician-directed source of continuing medical care for the infant is identified. Ensure that an appointment has been made for the infant to be examined within 96 hrs of discharge
 - The care manager or physician will contact the caregivers of all infants who are discharged before 24 hrs
 - Car seat challenge testing for at-risk infants

WHY FOCUS ON CARE OF NEWBORNS

The hospital stay should be long enough to allow identification of early problems and to ensure that the family is able and prepared to care for the infant at home.

Transition from fetal to newborn life is a critical period involving diverse physiologic changes. The newborn must move from a fetus completely dependent on another for life-sustaining oxygen and nutrients to an independent being, a task that requires intense adjustment carried out over a period of hours to days.

Many cardiopulmonary problems related to the transition from an intrauterine to an extrauterine environment usually become apparent during the first 12 hours after birth. However, detection of jaundice, ductal-dependent cardiac lesions, gastrointestinal obstruction, and other problems may require a longer period of observation by skilled health care professionals.

DISCUSSION

- **Breastmilk should be the standard for infant feeding.** Breastfeeding is the single most powerful and well-documented preventive modality available to health care providers to reduce the risk of common causes of infant morbidity. The American Academy of Pediatrics recommends exclusive breastfeeding for 6 months, followed by continued breastfeeding as complementary foods are introduced, with continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant.
- **Prophylaxis against gonococcal ophthalmia neonatorum is state mandated for all newborns.** Antimicrobial ophthalmic prophylaxis soon after delivery is recommended for all neonates but may be delayed until after the initial breastfeeding. Acceptable prophylactic regimen is an application of a 1-cm ribbon of sterile ophthalmic ointment containing erythromycin (0.5%) in each lower conjunctival sac.
- **Administration of vitamin K.** Every newborn should receive a single parenteral dose of natural vitamin K to prevent vitamin K-dependent hemorrhagic disease of the newborn. This dose should be administered shortly after birth, but may be delayed until after the first breastfeeding. Oral administration of vitamin K has not been shown to be as effective as parenteral administration for the prevention of late hemorrhagic disease.
- **Dry cord care.** Because a moist cord is vulnerable to pathogens, measure should be taken to promote drying of the cord, including exposing the cord to air. Over the years, a variety of methods of cord care have been used. Research has shown that air drying results in cords separating more quickly than those treated with alcohol.
- **Early hepatitis B immunization.** Neonates born to mothers who have positive HBsAg should receive the HBV vaccine and hepatitis B immunoglobulin (HBIG) within 12 hours after birth. All neonates should receive the vaccination before leaving the hospital.
- **Hypoglycemia.** Early identification of the at-risk infant and institution of prophylactic measures are recommended to prevent neonatal hypoglycemia. *Refer to the hypoglycemia algorithm.*

- **Newborn screening programs are mandated.** These are state-based public health programs that provide newborns in the United States with presymptomatic testing and necessary follow-up care for a variety of medical conditions. The goal is to decrease morbidity/mortality by screening for disorders, which early intervention will improve neonatal and long-term health outcomes for the individual.
- **North Carolina State statute mandates all newborns will have their hearing screen prior to discharge.** The prevalence of newborn hearing loss is approximately 1-2 per 1,000 live births, with an incidence of 1 per 1,000 in the normal newborn nursery. Tracking and close follow-up by the state Early Hearing Detection and Intervention programs are essential to ensure that children receive appropriate and necessary evaluation and intervention.
- **Jaundice occurs in most newborns and is usually benign.** Because of the potential toxicity of bilirubin, newborns must be monitored to identify those who might develop severe hyperbilirubinemia and, in rare cases, acute or chronic bilirubin encephalopathy. Before discharge, it is recommended that a systematic assessment for the risk of severe hyperbilirubinemia be made, a plan for treatment be developed (when indicated), and early follow-up after discharge be arranged based on the risk assessment.
- **The Period of Purple Crying.** A skill-building program that approaches shaken baby syndrome/abusive head trauma (SBS/AHT) and infant physical abuse prevention by using a child development approach. The program is designed to create a cultural change in the way parents and others think about infant crying, especially inconsolable crying, which is based on decades of research by many scientists on normal infant crying. If parents can understand and handle this normal, early crying period, they are less likely to feel stressed to the point where they shake their baby out of frustration and anger.
- **The threat of infant abduction.** Hospitals are required to have active infant abduction prevention programs. According to the National Center of Missing and Exploited Children, abductions by non-family members of infants (birth through 6 months) from healthcare facilities has become a subject of concern.
- **SIDS (sudden infant death syndrome) remains the leading cause of post neonatal infant mortality in the United States.** However, the incidence has declined by more than 50% since 1992 with the initiation of Back to Sleep campaign now known as Safe to Sleep. Education to reduce modifiable risk factors, such as non-supine sleep, is the most effective intervention available. SIDS remains the leading cause of death for babies aged 1 month to 1 year. Risk factors for SIDS include:
 - Sleep on stomach
 - Sleep on soft surfaces (including but not limited to adult mattresses, cushioned chairs, or other soft blankets/coverings)
 - Sleep under soft or loose bedding
 - Getting too hot while sleeping
 - Exposure to smoking before birth
 - Exposure to smoke in the home

Sleeping in adult beds is dangerous because they are not designed for infants. Beds are even more dangerous if shared with an adult, another child, or pet.

Risks can be mitigated by instructing caregivers to place the baby to sleep on their back and to share their room with the baby in a separate bed.

- **Car seat testing must be performed for at risk infants.** At risk infants are those who were born at less than 37 week's gestational age or any infants less than 2,500 grams at birth. The Car Seat Challenge is used to determine if at-risk infants are capable of safely traveling in a car seat by monitoring the infant's heart rate and oxygen saturation levels and observe for apnea, bradycardia and desaturation for a predetermined amount of time.

METRICS

- **Newborn mortality rate**
- **Readmissions within 28 Days:** all cause readmissions within 28 days with diagnosis of normal newborn
- **Post DC Pediatric Appointment Confirmed by Nursing**
- **Length of Stay:** average of (days for each encounter) and Observed/Expected (CMS) Ratio by DRG
- **Average Cost per Case**
- **PRC Experience:** overall quality of care
- **Exclusive Breastfeeding**

This guideline is not intended to be construed or to serve as medical advice, for diagnosis or treatment, or to indicate a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care. The ultimate judgment must be made by the appropriate health care professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgment should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available.

RESOURCES

During the postpartum hospital stay, health care personnel should provide educational activities that include information explaining the rapid changes in physiology that occur in the newborn. Parents should be familiar with normal and abnormal changes in wake/sleep patterns, temperature, respiration, voiding, stooling, and the appearance of the skin—including jaundice. They also should observe and become familiar with the behavior, temperament, and neurologic capabilities of the newborn.

Several patient education resources are available to help educate parents:

- Newborn Care (Pediatric)
- Newborn Late Preterm Baby
- SIDS prevention
- Skin Care babies (pediatric)
- Circumcision Infant Pediatric Post-Op
- Uncircumcised Penis Newborns

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ACHIEVING THE BIG(GER) AIM

To get every person to their desired outcome, first without harm, also without waste and always with an exceptional experience for each person, family and team member.

ABOUT MISSION HEALTH

Mission Health, based in Asheville, North Carolina, is the state's sixth-largest health system and was recognized as one of the nation's Top 15 Health Systems from 2012-2015 by Truven Health Analytics, formerly Thomson Reuters, becoming the only health system in North Carolina to achieve this recognition. Mission Health operates six hospitals, numerous outpatient and surgery centers, post-acute care provider CarePartners, long-term acute care provider Asheville Specialty Hospital, and the region's only dedicated Level II trauma center. With approximately 10,700 employees and 2,000 volunteers, Mission Health is dedicated to improving the health and wellness of the people of western North Carolina. For more information, please visit mission-health.org or [@MissionHealthNC](https://twitter.com/MissionHealthNC).

