

Tippet Foundation
Neonatal Intensive Care Unit
Baby Steps to Grow

Parent Resource Book

Written & Published by
Neonatal Intensive Care Unit Health Care Team
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**NORTH YORK
GENERAL**

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CHAPTER 1: WELCOME

Letter from the NICU Staff

Dear parents,

Welcome to the Tippet Foundation Neonatal Intensive Care Unit (NICU). We understand this may be an overwhelming time for you and your family, and you may have many questions. This booklet is intended to address some of those questions.

The most common question we receive is “When can we go home?” Every baby’s situation is unique and an estimated time may be difficult to give when your baby arrives in the NICU. In general, your baby’s progress will be measured according to the following discharge milestones:

1. Feeding by mouth (exclusively) for two days (also known as being “48 hours all oral”)
2. Steady weight gain to a minimum of 1,800 grams (or 3lbs and 15oz)
3. Gestational age of 35 weeks or more
4. Medically stable (also meaning “no spells”)

Progress towards these milestones will be charted daily by the nurses assigned to your baby. If you have any questions about your baby’s progress, your nurse or physician will be happy to answer them. Your baby will need to meet all four milestones in order to be discharged. Your baby may also be required to meet other criteria, such as a car seat test, but the team will discuss any additional discharge milestones with you directly.

A doctor will be assigned to your baby to monitor his/her daily progress. Daily rounds in the NICU begin at 10 a.m. each weekday. We encourage you to be present in order to receive an update on your baby and to discuss any questions or concerns you may have with the whole NICU team. The interprofessional team consists of doctors, nurses, pharmacists, dieticians, an occupational therapist, a lactation consultant, social workers, respiratory therapists, a home care coordinator, and others.

We have prepared this Welcome Booklet to assist you during these early days and throughout your baby’s stay in the NICU. As part of your orientation, you will receive the following during your first week in the NICU: (1) Welcome booklet, (2), tour of the unit, (3) outline of Visitor Policy/Hours, (4) Introduction to a lactation consultant, and (5) Introduction to the parent support volunteer program.

The information you receive during your orientation may answer some of your questions, but we expect that you will have many more over the course of your baby’s stay in the NICU. Our interprofessional team is here for you and will partner with you in caring for your baby and preparing your family for discharge home. We encourage you to communicate with us regarding your baby’s care, so that we may assist you in whatever ways we can as your baby develops.

At any time, please do not hesitate to approach us with questions or concerns.

All the best,

NICU Staff, Tippet Foundation Neonatal Intensive Care Unit, North York General Hospital

Letter from the Medical Director

Welcome. With your baby in the NICU, I can only imagine how tremendously stressful and uncertain this period must be. I can assure you that all our staff members are dedicated to providing the best care for your baby, and we strive to support you and your family the best we can during these difficult times.

We have an amazing group of dedicated individuals who work tirelessly to look after every aspect of your baby's care. In the coming days, you will meet many of us, and I hope that you will find reassurance in our well-coordinated team's expertise.

Our neonatologists are highly skilled in the intensive care of newborns and infants. Your neonatologist is committed to the medical care of your baby and is always available to meet with you to discuss the progress of your baby's condition.

The creation of this parent resource booklet is an exciting endeavor, with the intention of giving you relevant information that is more applicable to your baby. It is put together by a group of talented and resourceful individuals. In this booklet, information on our philosophy, and the way we provide care to your baby is provided in detail. There is also a modest amount of medical information in the hopes of better explaining your baby's specific condition(s). I hope that you will find the content of this resource booklet useful. Of course, all our staff members are always happy to answer any questions and to clarify any information for you.

Furthermore, if I may be of any help, or if you would like to discuss any concerns regarding your baby's care, please do not hesitate to contact me. You can arrange for a meeting with me through your baby's nurse or you can email me at Shaheen.Doctor@nygh.on.ca.

NICU care team: Who's who?

Our unit has an interdisciplinary healthcare team. You will meet many of us while your baby is admitted to the NICU. This can be very overwhelming, particularly within the first few days. We will help you to settle in and explain our roles in caring for your baby, but here is a quick introduction.

You are the most important caregivers to your baby. We will teach and provide you with guidance on how to handle, diaper, bathe, and feed your baby. We encourage you to be

involved in decision making and care throughout your baby's admission to the NICU. You know your baby best and are the most consistent people in his/her life. Your baby will know your voice and scent right away. Enjoy loving, comforting, and bonding with your baby. We are here to support you and your family.



Paediatrician/neonatologist

A neonatologist will be responsible for your baby's medical management. A neonatologist is a paediatrician whose area of expertise is preterm babies or unwell newborn babies born at term. Results of tests, necessary interventions, and plan of care will be discussed with you. The neonatologist is usually available during the daytime and some evenings to answer any questions you may have about your baby. An on-call paediatrician is available to handle emergency situations overnight when the neonatologist is not here.

Clinical Team Manager

As a registered nurse with a clinical background in neonatal and paediatric nursing, the clinical team manager is responsible for the management of the unit and is a resource to the staff and families of the NICU. They are approachable and appreciate feedback from the families. Their office is located on the unit and parents are welcome to speak with her. They can be reached at 416-756-6000 ext. 6842.

Registered nurses

The nursing staff is responsible for the day-to-day care of your baby. All nurses working in the NICU are specialized in neonatal nursing. Nurses provide support to parents as they learn more about their infant and the care he/she requires. If your baby is likely to remain on our unit for a longer admission, you may request that a primary nurse or primary nursing team be established. It

is our desire to provide continuity of care as much as possible. Our nurses work eight hour and 12 hour shifts. Shift changes are as follows:

- 7 a.m. and 7 p.m. (12 hour shifts)
- 7 a.m., 3 p.m. and 11 p.m. (eight hour shifts)

Resource nurse

The resource nurse (sometimes called a “charge nurse”) coordinates daily care on the unit, providing continuity of care to our patients and families. In this role, the resource nurse also offers clinical support and leadership to the interprofessional health care team. The resource nurse can be reached at 416.756.6305.

Registered respiratory therapists

The registered respiratory therapist (RT/RRT) provides expertise in the management of babies that require oxygen therapy and/or breathing support and will be available to answer your questions concerning your baby’s treatment.

Dietitian

The registered dietitian will assess the nutritional needs of your baby and ensure they are meeting their recommendations. Your baby’s vitamins, calorie & protein intake, feeding volumes, and more are monitored and managed closely with the larger team to ensure optimal growth and development of your infant. You can contact the dietitians at 416-756-6000 ext 3111.

Social worker

The social worker provides a range of practical and emotional support to our NICU families. They can help you create a plan to juggle home and hospital responsibilities, connect you with community resources, and help you determine your work leave and benefit options. They can also help you cope with any challenging feelings you may have during this time. Your social worker can be reached at 416-756-6000 ext. 4814 Tuesday to Friday.

Lactation consultant

The lactation consultant is also a registered nurse who has an international certification in breastfeeding and an expanded knowledge of breastfeeding. The consultant can assess your baby’s feeding and provide additional assistance to you and your baby. The lactation consultant can be reached at 416-756-6000 ext 4735.

Occupational therapist

The occupational therapist (OT) is a registered clinician who has specialized skills and training in the assessment of oral feeding, positioning, and infant neuromotor development. They help both parents and staff learn how to respond to infant cues/states/behaviours and make

recommendations to address the developmental needs of your baby. The occupational therapist can be reached at 416-756-6000 ext 3112.

Pharmacists

Our pharmacists have specialized training in the assessment of medications for the neonatal population. The pharmacists will review all medications for appropriateness and relevant interactions before they are given to your baby. They are available to answer your questions and will meet with you to review your baby's medications prior to discharge.

Clinical nurse educator

The clinical nurse educator (CNE) is a registered nurse with a strong clinical background in neonatal nursing. The CNE provides education to all staff members in our NICU and to families when needed.

Unit secretaries

The unit secretaries will welcome you at the reception desk and when you call into the unit. They can also assist you with general questions about the NICU. The unit secretaries can be reached at 416.756.6305.

Patient Experience Partners

Parents whose infants were admitted to the NICU and now provide feedback and advice to the NICU team on policies and procedures that relate to families.

Child life specialist

Our child life specialist is a trained professional with a background in child development and family systems. The specialist works with siblings of NICU patients to promote effective coping through play, preparation, education, and self-expression activities. The specialist also works with staff and families to provide age-appropriate stimulation for babies admitted to the NICU. The child life specialist can be reached at 416-756-6000 ext 4222.

Spiritual and Religious Care

Spiritual care services are available to offer emotional and spiritual support to the families. They are sensitive to the rites and traditions of all faith groups. Please let a member of the team know if you would like to speak with someone from Spiritual and Religious Care. Spiritual Care can also be reached at 416.756.6311.

Parent Support Volunteers

Our parent support volunteers are specially trained volunteers who provide comfort holding babies in the NICU when parents are unable to be at the hospital. You will be provided with an information sheet on the program when your baby is admitted to the NICU.

Services at North York General Hospital

Service	Location	Hours of Operation
Out-Patient Pharmacy	<ul style="list-style-type: none"> • Ground floor, near cafeteria • Phone: 416.756.6752 • Fax: 416.756.6997 	<ul style="list-style-type: none"> • Mon-Fri, 8:30 a.m. - 5:30 p.m. • Sat-Sun, 9 a.m. - 4 p.m. • Closed Statutory Holidays
Bank machines	<ul style="list-style-type: none"> • Ground floor, Torokvei Atrium • First floor, West Lobby 	<ul style="list-style-type: none"> • 24 hrs/day, seven days/week
Food Services Cafeteria Subway Starbucks Tim Hortons	<p>Ground floor – Main Lobby Ground floor – Main Lobby Ground floor – Main Lobby</p> <p>Ground floor – Main Lobby 1st floor, West lobby (24 hours)</p>	
Information Desks	<ul style="list-style-type: none"> • Ground floor, Torokvei Atrium and • 1st floor, West Lobby 	<ul style="list-style-type: none"> • Mon-Fri, 8 a.m. - 7 p.m. Sat-Sun, 9 a.m. - 7 p.m. • Mon-Fri, 8 a.m. - 3:30 p.m. • Mon-Fri, 8 a.m. - 3:30 p.m.
Louise Kirby Multi-faith Chapel	<ul style="list-style-type: none"> • Ground floor, near Gift Shop 	<ul style="list-style-type: none"> • 24 hrs/day, seven days/week
Parking Services	<ul style="list-style-type: none"> • Visitor parking structure outside Torokvei Atrium • 416-756-6352 	
Patient Experience Office	<ul style="list-style-type: none"> • Room GSE-114 (Ground floor) 	<ul style="list-style-type: none"> • 416-756-6125 • Mon-Fri, 8 a.m. - 4 p.m.
Security/Lost & Found	<ul style="list-style-type: none"> • Charlotte & Lewis Steinberg Emergency, 1st floor 	<ul style="list-style-type: none"> • 416-756-6049
Spiritual & Religious Care	<ul style="list-style-type: none"> • Ground floor 	<ul style="list-style-type: none"> • 416-756-6311 • Mon-Fri, 8:30 a.m. - 4:30 p.m.

Hand washing: Keeping your baby safe

Babies in our NICU environment are more likely to catch germs that cause infection.

Minimizing the risk of infection for our babies is very important and crucial for their growth and development. It is difficult for small and /or ill infants to fight off an infection. Therefore, we ask that parents and visitors be diligent with hand washing.

Each time parents/visitors enter the unit, they must wash their hands thoroughly with soap and water, followed by application of hand sanitizer for 15 seconds prior to touching their baby. Any visitor that is unwell should not enter the unit until they have recovered. Visitors/family members with risk of chickenpox exposure or any other illness are asked to call the unit (416.756.6305) to discuss the issue with the staff *prior to visiting the hospital*. These policies are in place for the protection of all our babies.

Parents who are feeling ill should also call into the unit and alert staff. Generally, staff will let parents know if it is safe to visit. This will also ensure that staff are aware if parents will be available to visit their baby throughout the day.

When parents visit, they will be asked to show their identification band. If your baby was transferred to our unit from another hospital, we will provide him or her and both parents with identification bands.

NICU visiting guidelines for families

Guidelines for other family members

- Both parents may be with their baby at any time throughout the day or night.
- Siblings of the baby aged 5 and over may also visit anytime as long as they are healthy (no recent cough, runny nose, fever, or exposure to chicken pox). No other children are allowed to visit. Young children will require parental supervision while they are in the unit. Parents are welcome to use the parent lounge where there are toys, books, and a TV available.
- A maximum of two people may visit the unit at a time (this includes parents).
- No children under 12 years of age may visit unless they are siblings. A parent must accompany family members (i.e., grandparents, aunt, uncle, friends, etc.) unless they have a designated visitor badge (see below).
- **Designated visitor program** – You can select up to two family members or friends to come visit and hold your baby when you are not present. This is particularly helpful if you are unable to visit regularly or if other family members besides you and your partner will be helping in the care of your baby after discharge to home.
- Please let the team know if you would like to take advantage of the designated visitor badge program. You will be asked to sign a consent form and provide information about your visitors. This information will be written on the badges.
- Visitor badge holders are required to wear their badges in the NICU any time they visit without a parent present.
- Please note that visitor badges only permit access to the holder. They are not permitted to bring other visitors into the NICU unless they also have badges or a parent is present.

Guidelines for use of parent lounge

- The parent lounge is open 24 hours/day, seven days/week.
- It includes a kitchenette with a sink, fridge, microwave, kettle and coffee/tea maker. There is also a seating area with tables, chairs, couches, and a television. The lounge is for parent and family use.
- Children under 12 may use the parent lounge if they are siblings of the baby, but children must always be supervised.

Guidelines for use of care-by-parent rooms

- The Care-by-Parent (CBP) rooms are primarily for use by parents and babies the night before discharge. The aim of these rooms is to provide an opportunity for you to provide primary care to your baby within the hospital environment. The experience is meant to mimic the time that most other babies spend with their parents on the Postpartum Unit.

- In order to be eligible for use of CBP Room, the baby's mother must be discharged from the hospital. If the mother is still admitted to the Postpartum Unit when the baby is ready for discharge from the NICU, the baby will be transferred back to the Postpartum Unit.
- Your baby will be eligible for transfer to a CBP room with you when he/she no longer requires medical monitoring.
- A parent or caregiver must be in the CBP room at all times with the baby. The nursing staff will provide support and education regarding the care of your baby.
- When space allows, a family may be given access to a CBP room before their baby is ready for discharge. This is determined based on room availability, as well as the needs and situation of the family.

Guidelines for use of courtesy room

- The courtesy room is for use by mothers who are discharged from the hospital, have a baby in the NICU, and need a place to rest.
- The charge nurse will decide which mothers may use the two beds in the courtesy room based on the needs and situation of the family on a daily basis. Priority will be given to the mother who is establishing breastfeeding and is not yet able to be transferred to a CBP Room.
- When two mothers are using the courtesy room, visits from others should take place in the parent lounge.
- Visiting guidelines are the same as the guidelines for the parent lounge.

If you decide to leave the unit for any length of time, please inform your baby's nurse of where you can be reached and when you will return.

Parenting in the NICU: An overview

Having a baby born early or sick can be distressing for parents. The neonatal intensive care unit (NICU) can be a scary place because of all of the sounds and machines that are used. You may have many overwhelming feelings about your baby being sick: you may be feeling sad, guilty, scared, or worried about your baby and what is going to happen. Parents and caregivers often have many of the same feelings about having a sick baby, but people often express those feelings in different ways – and that's okay. Be patient with each other. It's okay to ask questions, and you can always ask the same question again if you don't understand or don't remember the answer.

At first, your baby may be too sick to hold, and noise and lights may be too much for them. One way you can help your baby is to gently touch or talk to them in a quiet voice. You play a very important role in your baby's care and ongoing development. Your presence at the bedside is very comforting to your baby, who knows your voice and scent best. Your voice can be calming to your baby. As your baby becomes more stable, your nurse will show you how you can place

your hands on your baby (hand hugs) or hold him or her skin to-skin to help your baby feel secure.

As your baby develops and grows, the nurse will also let you know how you can help with your baby's care. Being involved in your baby's NICU care will help you feel more comfortable caring for your baby once you go home. There are many ways you can interact with your baby during the NICU stay, including talking, reading, and singing. You can hold your baby, change their diaper, and help give baths. You can also provide skin-to-skin or kangaroo care for your baby, and you will learn how to feed your baby.

As your baby is able to do these things, you will be a few steps closer to going home!

How to participate in care and decision making

You are the most important people in your baby's life and in their care. You will become an expert and advocate in their care, and the healthcare team needs you to help us provide your baby's care. There are many ways that you can do this:

- Come to the NICU as soon as you can after your baby is born. Get to know your baby. Help us learn about his or her patterns, likes, dislikes, and ways of communicating. Let your baby hear your voice and feel your touch – they are comforting and familiar to your baby. We encourage you to visit the NICU on a regular basis, daily if possible.
- Learn what care you can provide for your baby (for example, holding or providing hand hugs, diaper changes, bathing, feeding, and calming your baby).
- If we use words you don't understand, don't hesitate to ask us to explain what we mean.
- Talk with your baby's medical team often. It helps to write down questions, concerns, or anything else about your baby that you would like to share. All members of the NICU team are available to you.
- If you feel that you need support communicating with the team or if you feel that communication has broken down, the social worker can support you in promoting positive communication. Ask your nurse to speak with the social worker if you would like assistance.

Opportunities for participation

We want to provide your baby with the safest care possible. Open communication with you helps us meet this commitment to you and your family. Studies have shown that parents who are included in caregiving and decision making are: less likely to suffer from depression and anxiety, less likely to experience a loss of trust in their healthcare providers, and more likely to feel connected with their baby. We value patient- and family-centered care and work to include family members as partners in care. The following list outlines potential opportunities for you to participate in and communicate about your baby's care:

- Participation in daily rounds - Rounds are daily meetings that take place at your baby's bedside to update the team and discuss daily goals and plan of care. They take place at 11:00am Monday to Friday. You are a vital part of your baby's care team. As such, you

are encouraged to attend daily rounds when possible. The team can also set up a Facetime call or Teams meeting if you are unable to be present.

- During these rounds, you are encouraged to provide the team with an update on your baby, to ask any questions, and to participate in the discussion about goals of care. If you have any questions/concerns which you are not comfortable discussing during rounds, please alert a member of the NICU team and they will meet with you privately
- Daily rounds take place at the bedside of each baby on the unit. In discussing the health of your baby and others on the unit, the NICU team will be sensitive to the confidential nature of certain updates. We ask that you also respect the privacy of other babies and not ask questions about them or discuss them with others.
- Please be mindful of the fact that private health information will be shared at this time. If you have invited other family members or friends to visit during this time, the team may ask that they leave the bedside during rounds.
- Transfer of accountability
 - Each time your baby’s care changes to a new nurse, a verbal report is given by the previous nurse. This report is called the “transfer of accountability.” The nurse who has been caring for your baby will give relevant information to the nurse taking over his or her care. This report typically happens at your baby’s bedside unless you request otherwise. Here are some things to keep in mind:
 - At the start of each shift, your nurse will need to confirm your baby’s identity by checking the identification band that is on your baby.
 - We invite you to be present for these reports, and we will be happy to talk to you about any specific concerns or questions after the reports have been given. All reports occur around the same time, when nurses change shift. (7 a.m., 3 p.m., 7 p.m. or 11 p.m.).
 - Family and interdisciplinary team meetings
 - You, your family, or the NICU team may request a family meeting at any time during your baby’s admission. These meetings are opportunities to discuss the plan of care, discuss concerns, or plan toward discharge.
 - We encourage both parents to attend family meetings. You are welcome to invite other support people as well.
 - Meetings may take place in the NICU training room or a meeting room off the unit. The NICU has interpretation services if needed.

Voicing concerns/complaints

At North York General Hospital, we do everything we can to support and help you and your family through our commitment to Patient- and Family-Centred Care. Hearing from you is important to us as it provides a greater understanding of how our care and services are experienced and enables us to make improvements where needed.

- NICU team
- If you have a concern or complaint while your baby is admitted to the NICU, you are welcome to address it directly with your bedside nurse/charge nurse or the most appropriate NICU team member. If you require additional support or assistance, you can approach the social worker or clinical team manager to help address the concern or complaint.
- Patient Experience Office
- You may also contact the Patient Experience Office for assistance. The Patient Experience Office provides patients and families with a supportive opportunity to provide feedback about your experiences at NYGH including compliments, concerns, questions and suggestions.
- How the Patient Experience Office can assist you:
 - Listen to and discuss your experience and concerns
 - Identify the appropriate contact person to help address your concerns
 - Support you in addressing concerns
 - Share compliments and feedback on your behalf
- Contact information
 - Hours: Monday to Friday, 8 a.m. to 4 p.m. (excluding statutory holidays)
 - Location: General site, room GSE 114 (ground floor)
 - Telephone: 416-756-6125
 - Email: patientexperience@nygh.on.ca

Taking care of yourself so you can take care of your baby

Many people feel overwhelmed when they become parents to a new baby. When your baby comes into the NICU, you not only have to adjust to being a new parent but you must do so within a medical setting.

Your whole life may be impacted by your child's NICU admission, and this can be daunting for anyone. To negotiate this experience in the healthiest way possible, try the following tips that have worked for other NICU families:

1. *Take a pause to absorb your current feelings.* This may involve anger, sadness, fear, numbness, or even relief that you and your baby came through this okay.
2. *Gather information about your baby.* Talk with the bedside nurses, neonatologists and allied health staff about how your baby is doing and how you can support your baby's health and development.
3. *Try not to overwhelm yourself.* Ask questions when you are ready and take notes because it will be hard to remember everything. If you are in a relationship, try to ensure that you are both present when significant information is being shared (i.e., diagnoses, test results, treatment plans). If this is not possible, try to have another support person with you and don't hesitate to ask the professional sharing the information with you to call the other parent and explain what is happening.
4. *Make a list of what needs to be taken care of.* Clarify who needs to do what and by when. There is a table below that can help with this.
5. *Don't forget about your needs.* Resting and getting enough to eat and drink will help to keep you healthy and allow you to spend time with your baby.
6. *Take stock of who you can rely on for support* (be creative with this) and reach out to them. It is important to have a strong support network as you move through this admission and into life at home with your baby. This can include family, friends, and community members (e.g., new mom support groups, religious affiliations).
7. *Accept that people often cope differently with stress.* One parent may need to talk about it a lot. The other parent may want to focus on practical things they can do. Know that it is normal for you to alternate between various coping mechanisms and styles. Support each other and try not to take it personally if you and your partner cope differently from one another.
8. *Family and friends will want to help you, but they won't always know how.* Make a list of what you need and post it on your fridge for all to see. You can also designate a spokesperson to provide updates and delegate tasks to your support network. Don't hesitate to be straightforward with your loved ones about what you need. Keep a running list as you go through your day of things you wish you could have help with. This way you can be specific when someone offers you help.

Below is a table of how everyone can pitch in when a baby is admitted to the NICU. Use this information to guide how you organize yourself and the people available to support you.

Moms	Both parents	Family and friends
Breastfeed Pump breast milk	Provide kangaroo care Bottle feed Clean bottles/pump kits Mix formula Change diapers Communicate with staff Apply for leave from work, employment insurance (EI) Bring breast milk to hospital Care for other children Stock up on simple and healthy meals and snacks	Cook and bring meals and snacks to hospital and home Care for other children (e.g., transport to/from school, babysit at hospital or home) Care for pets Buy groceries Do laundry Buy baby items Wash new baby items Put together baby furniture

CHAPTER 2: PATHWAY TO DISCHARGE

It may be hard to imagine, but soon the time will come when your baby will be ready to come home. You may feel both excited and anxious to think about caring for your baby without the assistance of the NICU team. That is normal, but you will be more confident taking your baby home if you begin to prepare now.

Your baby will be ready for discharge when he/she:

- Is breathing well on his/her own with no periods of stopped breathing (known as apnea) or slow heart rate (known as bradycardia)
- Can feed from a bottle or the breast without breathing or other problems
- Is gaining weight well
- Can maintain a normal temperature
- Does not need any further medical/nursing care



To get ready for your baby to come home, help care for your baby as often as possible during your baby's hospital stay. Before going home, you and others who will take care of the baby will need to learn about:

- Feeding
- Voiding and stooling patterns
- Basic care (baths, skin care, taking temperature)
- Safety at home
- Infant cardiopulmonary resuscitation (CPR)
- Signs of illness and protecting your baby from infection
- Sleep positioning
- Car seat safety
- Giving medicine
- Other special care that your baby might need

Before leaving the hospital, your baby may have some or all of the following:

- Eye exam
- Hearing Screening
- Car seat test
- Critical Congenital Heart Disease (CCHD) Screening

- Jaundice screening
- Immunizations and respiratory syncytial virus prevention
- Assessment for special home equipment or home care

When your baby is ready for discharge it is also suggested that you stay in a care by parent room with your baby for 24 to 48 hours. This will give you a chance to provide all care to your baby and feel comfortable with handling, bathing, and feeding. You will continue to have an assigned nurse who will check in and help as needed.

Discharge preparation

1. Choose a doctor:

Choosing a doctor to care for your baby after discharge is an important decision. Discuss your baby's follow up care needs with the NICU team and start looking for a doctor before your baby is ready to go home. This will give you time to find someone you are comfortable working with and will make taking your baby home less stressful. If you are considering your family doctor, speak to them prior to going home to ensure they are able to take on a premature or newborn infant.

Here are some questions to ask potential providers:

- Is the doctor accepting new patients?
- Can you set up an appointment within a few days of discharge from hospital?
- Does the provider have experience caring for infants with your baby's conditions, such as prematurity or feeding challenges? Is the provider comfortable coordinating the specialty care your child may need after going home?
- What are the doctor's hours? Are weekend hours available? Can you make same-day appointments if needed?

Discussing these topics with your provider before bringing your baby home can make you more comfortable with your provider and make coming home less stressful. Don't forget to schedule your first appointment within a few days of going home. Once you choose a doctor and make your appointment, make sure to give that information to the NICU team so they can share relevant medical information about your baby with your baby's doctor.

2. Prepare yourself with cardiopulmonary training

The Canadian Paediatric Society suggests all parents learn infant cardiopulmonary resuscitation (CPR) before their babies leave the hospital.

We have our occupational therapist who conducts a basic class on the unit. Speak with your nurse or our unit clerk if you are interested in attending the class (close to discharge). The hospital also offers a basic first aid course for infants and children called "Link-to-Life" – a child emergency workshop, open to parents, grandparents, older siblings, and babysitters. This program offers basic first aid, care of cuts, bruises, choking and CPR. The cost is \$37/per person. You may register through Prenatal Services at 416-756-6000 ext.6336.

CPR training for infants and children may also be offered through the Red Cross, St. John Ambulance, and several hospitals across the GTA. You will learn basic CPR skills to help your baby until emergency responders arrive. Although you may feel anxious as your baby is being prepared for discharge from the hospital, becoming familiar with emergency procedures will help decrease your fear and increase your confidence when taking your baby home.

3. Prepare your home

Purchasing clothing, diapers, bottles, nipples and a safety approved crib and car seat can be done early in your admission and are best not left to the last minute. Look for sturdy furniture and baby care items. Be sure that they meet today's safety standards. This is especially important if you are borrowing or buying used items. The occupational therapist can provide suggestions regarding appropriate feeding equipment.

When cleaning your baby's room in preparation for discharge, remove dust and dirt, but avoid the use of strong-smelling cleaning products. Premature babies don't like strong smells, and their lungs are still growing. Don't let anyone who is sick or smoking near your baby.

Read your car seat care manual prior to picking up your baby, to make use and installation easier. If you are planning on buying a thermometer, be sure it is one that can measure your baby's temperature by placing it under the arm (axilla). A digital thermometer is convenient, as it will beep when the temperature has registered. Glass thermometers require five minutes under the arm. Ear thermometers are only recommended for older children.

Your baby is finally home

The first few weeks at home are an adjustment period for all of you. Remember to allow others to support you in this transition. You, as a parent, are doing a great job.

Support is available to you by contacting your doctor or Telehealth Ontario (1.866.797.0000). The NICU staff is also available to answer your inquiries over the phone (416.756.6305).

Here are a few helpful tips for home:

Corrected age

- The age of a premature baby is corrected to monitor development of the baby at the appropriate state, by subtracting the amount of time they were born premature from the chronological age.
- If your baby was born two months premature, he/she may behave like a one-month-old (corrected age) infant even when he/she is three months old chronologically.
- Correcting usually stops at two years of age.

Illness and infection prevention

- Hand washing is the best way to prevent the spread of infection. It is as important at home as it is in the hospital. Remember to wash:
 - Before formula preparation
 - Before feeding your baby
 - After you change a diaper
 - Before you handle your baby, if you have a cold or illness.
- If your infant experiences any of the following symptoms, please contact your doctor:
 - Fever
 - Refusing to eat
 - Difficulty with feeding
 - Difficulty with breathing
 - Excessive crying
 - Excessive vomiting
 - Unusual bowel movements
 - Listlessness or lethargy

Coping

- Have a plan for times when the baby is crying or fretful. It is easy to become angry when the baby won't calm down when you try to comfort him or her.

- If you are ever feeling so overwhelmed that you are worried about yourself, put your baby down in a safe place, step away, and call someone to come over and help you. Even if things are not that serious, don't hesitate to reach out to trusted family and friends who can help if you are tired or need a break.

Home safety

Below are some tips and warnings to help ensure your baby's safety when you return home.

Medications

- Keep your baby's medicine bottles away from other small children.
- Discuss any home medications with other caregivers and share instructions on the medication sheet you receive from the pharmacist.

Bathtub safety

- Don't rely on baby bathtubs, bathtub rings, pool noodles, floaties, or other air-filled toys to keep your baby above water. These items cannot replace adult supervision.
- Before you begin bathing, have all supplies within arm's reach.
- Prevent your baby from being burned by the water by testing bath water temperature with your inner wrist or a bath thermometer. The water should be lukewarm or no warmer than 37.7 °C to 40 °C (100 °F to 104 °F) and deep enough to allow your baby to settle into the water with his or her body well covered. Move your hand through the tub to mix any hot spots. Wash your baby's face with clean water only (Don't use soap on the face until they are older – your doctor can tell you when it is alright to do so). Clean your baby's body and then shampoo the hair with a new clean cloth.

Kitchen safety

- Put your baby down before handling hot objects
- Do not hold your baby while cooking
- Always follow the instructions for how to prepare formula. Breast milk or formula should never be warmed in the microwave. A bottle warmer or placing the bottle in a bowl of hot water should be used to warm expressed breast milk or formula. Testing the warmth of the formula or heated breast milk on your wrist before giving it to your baby
- Your baby's food should be barely warm
- Keep hot food or drinks, such as coffee, out of reach
- For burns, run cool water over the burn right away, then call your baby's doctor. If you are worried that the burn is severe, call 911

Nursery safety

Babies spend much of their time sleeping; therefore, the nursery should be the safest room in the house.

- Your baby should sleep in a crib, not in your bed. The crib should hold a firm mattress with tight-fitting sheets.
- The crib should not have any soft surfaces, including sheepskins, comforters, or fluffy quilts.
- Remove any loose blankets, toys, pillows, stuffed animals or any objects from under their head that is used for head shaping from the crib.



- When your baby is awake, give him or her at least an hour of tummy time each day. This can be done in small increments as tolerated by the baby.
- The mattress should not be elevated in any way with pillows or blankets underneath
- Never leave your baby on a bed, couch, or changing table due to the risk of falling.
- Check the paint on the crib. Peeling paint could be harmful if swallowed.
- Keep the crib away from windows. Keep window blind cords, rosaries, or strings away from the crib.
- Do not put your baby to bed with a bottle.
- Do not attach a pacifier to a string or chain while in bed.

When buying a new crib, ensure that the crib is safe. If you are getting a used crib from a store or a friend, be sure to check the following:

- It is not recalled (see <http://healthycanadians.gc.ca/recall-alert-rappel-avis/index-eng.php>)
- It meets all current federal industry standards
- Mattress support is securely attached to the crib headboard and footboard
- There are no cut-out areas on the headboard or footboard
- Slats are not missing, loose, splintered, or cracked
- Slats should be 2.6 inches apart or less; a soda can will not fit through
- The mattress fits snugly against the frame. It should allow no more than two fingers between the edge of the mattress and the crib side
- The sides of the crib are at least 22 inches above the mattress
- There are no sharp corners, jagged edges, or projections, such as posts

- No parts are broken, cracked, or loose. The screws or bolts holding the crib together are tight and not missing
- Regularly check the crib's hardware. If any screws or slats loosen again after tightening, it's best to replace the crib
- Place the crib at least 2 feet away from heating vents, windows, window-blind cords, drapery, or wall lamps and 1 foot from walls and furniture
- Cover the mattress with a snug-fitting crib sheet with elastic corners and nothing more. Do not use a sheet from a larger bed

Fire safety

- Test smoke alarms monthly and replace the battery when you change the clock for daylight savings time.
- Create a fire escape plan and practice it. If the door is blocked or on fire, is there another way out? Do you need a window ladder? Who will get the baby? Where will you meet outside?
- Do not put electric cords under rugs or overload sockets.
- Keep space heaters away from anything that can catch fire. Never use the oven to heat your home. Blow out candles when you leave the room.
- Keep a fire extinguisher in the kitchen.
- Do not let anyone smoke in your home. If you smoke, go outside, but never leave your baby alone.
- Close doors to bedrooms at night. In case of a fire the closed door keeps more oxygen in the room and away from the fire. Also gives more time to plan an escape.
- In case of a fire, take your baby to a neighbour's home and call 911.

Babysitters

When leaving your baby with a babysitter, place emergency phone numbers near the phone and show them to the babysitter. Tell the babysitter how to reach you. Include the following:

- Emergency contact name and phone number
- Your local emergency number (e.g., 911)
- Poison Control Center (e.g., 1-800-268-9017)
- Your baby's care provider's name and phone number
- Your baby's birth date
- Your baby's health card and consent for emergency medical treatment if you are away overnight

Sun and outdoor safety

- Babies who are younger than six months old should stay out of the sun. Use a hat and a carriage cover but no sunscreen.
- Use netting on the stroller to protect your baby from bug bites.
- Before you put your baby into a car seat, make sure the car seat is not too hot from the sun. A hot car seat can hurt your baby.
- Use the car seat every time your baby rides in a car or taxi. Use sunshades for car windows to protect babies from the sun.

Water safety

As your baby grows, remember these things:

- Because toddlers can drown in 1 inch of water, empty wading pools, buckets or other containers and turn them upside down when not using them.
- Many drownings of young children occur in bathtubs, usually when the caregiver leaves “for just a minute.” Never leave a child in the tub, even with a sibling.
- In a household with toddlers, always put the toilet lid down and use toilet locks. Keep bathroom doors closed and latched so children can’t play in the bathroom.
- Plan ahead and buy latches for cabinets, drawers, doors, and toilets. Cover electrical outlets with safety covers.

Additional resources

Health Canada:

- Consumer products: <http://www.hc-sc.gc.ca/cps-spc/pubs/cons/child-enfant/safe-securite-eng.php>
- Playtime: <http://www.hc-sc.gc.ca/cps-spc/pubs/cons/child-enfant/play-jeu-eng.php>
- Sleeptime: <http://www.hc-sc.gc.ca/cps-spc/pubs/cons/child-enfant/sleep-coucher-eng.php>

Safe sleep

Sudden infant death syndrome

The term sudden infant death syndrome (SIDS) refers to when babies die in their sleep without any warning before their first birthday. Today, we know babies who sleep on their backs have a lower risk of SIDS. We also know that there are also many other easy things parents can do to keep their babies safe when they sleep.

Safe sleep

“ABC” is an easy way to remember how to make babies safe when they sleep. ABC stands for “alone, back, crib.”

Alone

Babies should always sleep alone. That means they should never sleep in the same bed as an adult, another child, or a pet. They should not sleep with anything in their cribs like stuffed toys, pillows, bumper pads, loose blankets, quilts, hats, headbands, bibs, or pacifier holders. The only thing that should be in the bed is the baby.

However, experts say sleeping in the same room with a parent, as long as the parent and baby are in their own separate beds, is safer than the baby sleeping in a room alone. Parents can bring their babies into their beds to feed or comfort, but when parents feel sleepy, they need to put their babies back in their own beds.

Back

Babies should sleep on their backs for every sleep, including all naps and at nighttime. They should be put on their backs to sleep at home, at day care, or in any friend or family member’s home.

Crib

A crib can be a crib, bassinet, Pack-N-Play, or playpen, but it should meet current Canadian safety regulations. It should also have a firm mattress and be covered with a well-fitted sheet only. It is very dangerous for babies to sleep on a sofa or armchair, because they can wiggle as they sleep and get trapped or roll off. It is also not safe for them to sleep in a car seat, bouncy seat, swing, baby carrier, or sling, because their neck can bend in ways that make it harder for them to breathe.

There are some other very important things that can help babies sleep safely:

- **No smoking:** Exposure to second-hand smoke can increase the risk of SIDS. Avoid smoking near your baby – in the house, in your car, or anywhere your baby sleeps or spends time. If you, your partner, family members, or friends smoke, make sure to smoke outside and far away from your baby. Also, anyone who smokes should wash their hands/face and change their clothes before they hold your baby.

- **Breast milk:** Any amount of breast milk given for any duration can help protect your baby from SIDS. Babies who are fed breast milk are less likely to experience SIDS.
- **Immunizations:** Making sure babies get their shots may cut their chances of SIDS by almost half.
- **Pacifiers:** We're not exactly sure why but giving your baby a pacifier when he or she is put to sleep may help too. You shouldn't force your baby to use a pacifier, and if it falls out after your baby is asleep, it's OK. It does not have to be put back in.
- **Temperature:** Keeping your baby from getting too hot can help. Dress your baby in no more than one extra layer than you would be comfortable wearing. Using warm sleepers, known as blanket sleepers or sleep sacks, instead of a blanket can be a good idea too. Blankets can get loose, cover a baby's head, and make it hard to breathe.

Worries

- Parents sometimes worry that babies will choke if sleeping on their backs. Actually, research shows that they are *less* likely to choke while sleeping on their backs.
- Parents also worry their babies won't sleep as well on their backs, but sleeping on their backs is much safer. Some babies do sleep more deeply on their stomachs, but experts think that because some sleep *too* deeply, this increases their chances of SIDS.
- Another thing many parents worry about is the flat or bald spots some babies get on their heads from sleeping on their backs. These almost always go away after babies learn to roll over and sit up by themselves. You should think of these as signs of a healthy baby who has been put to sleep safely. Providing tummy time when baby is awake is essential to minimize head flattening.

Remember:

- ABC (alone, back, crib)
- No smoking
- Providing breast milk
- Keeping immunizations up to date
- Using a pacifier
- Not letting a baby overheat

These are all things you can do to keep your baby safe while sleeping.

Shaken baby syndrome

What is shaken baby syndrome?

Shaken baby syndrome happens from violent shaking of the head of an infant or small child.

What can happen to a baby that is shaken?

Shaking an infant can cause bleeding in the brain or the eyes. The degree of brain damage varies. Any of these injuries can lead to severe disability or death. If you suspect a child has been shaken, get medical help right away. This could be the difference between life and death.

What are the symptoms of shaken baby syndrome?

- Decreased muscle tone
- Crying all the time
- Poor feeding or vomiting for no reason
- No smiling or baby talk
- Poor sucking or swallowing
- Stiffness or posturing
- Difficulty breathing
- Seizures
- Head or forehead appears larger than usual or soft spot on head appears to be bulging
- Not able to lift head

What population is at the highest risk?

Babies who are less than one year of age (with the highest risk period at two to four months) are at greatest risk. Babies can cry longer and more often at this age. Male infants are at a slightly greater risk than females.

How can shaken baby syndrome be prevented?

It is important to know this is preventable. Parents should share the message of the dangers of shaking with all who care for their infant or child. This includes grandparents, older children, day care providers, and others who care for your baby. Parents need to let those caring for the infant know that it is okay to call for help when needed.

Most cases involving shaking injuries occur when a frustrated caregiver loses control with a crying baby. It is important to realize that just saying “don’t shake a baby” is not enough; a plan of action or suggestions to deal with the situation need to be offered. Parents and other care providers need assurance that allowing a baby to cry is okay if all of their needs have been met.

Breastfeeding at home

Most mothers of premature and special care infants are a little nervous about how they will manage breastfeeding once their infants are home. For this reason, health professionals encourage parents to spend as much time as possible in the NICU during their baby's hospital stay. Working towards a feeding plan that supports Mother's goals. The healthcare team will help you create a feeding plan and determine whether you need to add any supplements to your milk to help your baby grow. The team will also discuss ways to tell if your baby is taking enough milk while feeding at the breast. Some babies do not get to their full breastfeeding potential before leaving the NICU. Some babies will need a bottle supplement (expressed breast milk or formula). However, continued support is offered after discharge through the breastfeeding clinic to support mothers to meet their goals. All mothers will meet with the Lactation Consultant to support pumping and breastfeeding.

Breastfeeding often begins with skin-to-skin time and some "lick and sniff" or sucking without swallowing much milk. Over time, your baby will learn to move milk out of the breast and begin to suck, swallow and breathe in a rhythmic pattern. As your baby gets closer to his or her due date, your baby will have more endurance and coordination to take a full feeding at the breast.

The journey toward full-time breastfeeding takes time. Be patient with yourself and your premature baby. Term babies who have been very ill or have had surgery may need extra help to learn to breastfeed. This means your baby may be 40-46 weeks gestation before he or she is breastfeeding without additional supplements. You will need to clarify with the dietician the timeframe expected for extra calories.

In general, you should continue to pump your breasts after nursing, while the baby is learning to breastfeed. Before you drop the number of times you pump each day, make sure your baby is getting enough milk and gaining weight. The lactation consultant will guide you to wean pumping as needed when baby is feeding well. Be sure to talk to your baby's provider or lactation consultant about any concerns you have with breastfeeding.

Your nurse and lactation consultant will provide you with outpatient resources and support groups to help you after discharge.

How to tell if your baby is getting enough milk:

The following signs indicate that your baby is getting enough milk when breastfeeding:

- Your baby wakes up on his or her own every two-three hours
- Your baby latches and stays on the breast sucking and swallowing for more than 10 minutes before falling asleep
- Your baby sucks and swallows in a nice rhythmic pattern and is actively feeding.
- You can hear swallowing
- Your breast softens during and after the feeding is over
- Your baby is having six-eight wet diapers

- Your baby is gaining weight and growing well

If your baby does not wake up on his or her own to feed, has a weak suck, and falls asleep after only five minutes at the breast, it is likely that he or she is not drinking enough milk. Be sure to contact your baby's healthcare provider if your baby is not feeding well.

Preventing infections at home

Babies born early have more risk of needing to return to the hospital due to problems with feeding, weight gain, or respiratory infections. There are things you can do to lower these risks. The most important thing to remember is to wash your hands. Teach everyone who touches your baby about good hand washing. Be sure to have soap or alcohol-based hand sanitizer by all bathroom sinks. It's a good idea to have hand sanitizer in any room in which you will take the baby. Keep hand sanitizer in purses and diaper bags, too.

Cleaning

Give the baby's room a good cleaning. Remove dust and dirt, but avoid the use of strong-smelling cleaners. Preterm babies don't like strong smells and because their lungs are still growing, those smells may be irritating. This is especially true for second hand smoke.

Sleeping

Your baby should always be placed on his or her back for sleep. Sleeping on the back lowers the risk of sudden infant death syndrome (SIDS) as well as fever, stuffy nose, and ear infection.

Friends and family

Do not let anyone who is sick or smokes near your baby. Ask anyone who is "coming down with something" to wait to visit. Limit the number of visitors and the length of time that guests stay. Second hand smoke can harm your baby's lungs and increase your baby's chances of having respiratory infection, ear infection, and hearing problems. Don't take your baby to crowded areas (for example malls or church) until they have been home for several weeks. This is especially important during the winter months of respiratory syncytial virus (RSV) season (November through early April).

RSV prevention

There are ways to protect your baby. RSV is a respiratory virus that spreads easily from coughing and sneezing. The virus can live on countertops, doorknobs and other hard surfaces for up to seven hours, and hands and clothing for up to one hour. During RSV season (November through early April in southern Ontario), wash your hands frequently and keep your baby away from crowds and anyone who is sick. Speak with your paediatric provider about your day care plans, too.

There is also a medicine (Synagis ®) that is recommended for babies at high risk of serious RSV infection. This can help lower your baby's risk of getting sick with RSV. While your baby is in the NICU, the team will assess the need for Synagis ® for your baby. Please see the RSV Section for more information.

Other notes

Breast milk is the best food for your baby for the first six months of life. Breast milk helps your baby's immune system fight respiratory and stomach infections.

You may see redness or small bumps on parts of your baby's bottom that have been near the wet or dirty part of the diaper. A poopy diaper can bother the skin. Diaper rash isn't serious and usually heals in three or four days with care. You can prevent diaper rash by changing wet and dirty diapers promptly, at least every two–three hours.

Clean your baby's bottom with plain water and a soft cloth. Let the area air dry before putting on an ointment and a clean diaper. If the diaper rash doesn't get better in three–four days, call your baby's provider. Ask about diaper care ointments you can buy at the store. They may want to give your baby medications that can help clear up diaper rash.

Respiratory syncytial virus

What is it?

- Respiratory syncytial virus (RSV) infects the lungs and airways and is the most common cause of bronchiolitis (lung infection caused by a virus) in young infants and toddlers
- Most active from November to April
- RSV can be spread by physical contact:
- Examples: mucus from nose/mouth, unwashed hands of a person with virus, soiled tissues, surfaces
- Sign and symptoms:
- Cough, runny nose, fever, wheeze

Preventing RSV

- Wash hands with soap and water or alcohol-based hand sanitizer before and after touching baby
- Avoid kissing or similar close contact with baby's face and hands when feeling unwell
- Cough or sneeze into sleeve
- Keep baby away from crowds and anyone who is sneezing, coughing, has a runny nose or fever
- Avoid exposure to cigarette smoke

Palivizumab (Synagis ®)

- Recommended by the Canadian Paediatric Society for babies during winter months who are at high risk of serious RSV infection
- Monoclonal antibody that gives baby antibodies that help fight RSV infection
- Prevents RSV from becoming very serious
- Given by injection into the muscle every month during RSV season (Nov-March)
- Your child may have a higher risk of getting very ill from RSV if:
- ≤ 32 weeks gestation and aged \leq six months at start of RSV season
- 33-35 completed weeks gestation, aged \leq six months at start of RSV season, and moderate-high risk on Risk Assessment Tool
- 33 – 35 completed weeks gestation and aged \leq six months at the start of RSV season, and who LIVE IN isolated communities
- Infants <24 months of age with Down Syndrome/Trisomy 21

- Infants <24 months of age with bronchopulmonary/chronic lung disease who required oxygen and/or medical therapy within 6 months
- Infants < 12 months of age with hemodynamically significant cyanotic or acyanotic congenital heart disease; requiring corrective surgery or is on cardiac medication for hemodynamically significant disease.
- Infants 12-24 months of age with ongoing hemodynamically significant congenital heart disease will be considered on a case-by-case basis

CHAPTER 3: DEVELOPMENTAL AND COMFORTING CARE

What is developmental care?

- It is a philosophy of care that involves a variety of activities that are used in the NICU to create an environment that is safe, quiet and comfortable; more like being in the womb than in a noisy busy hospital.
- These activities include: learning your baby's behaviours and cues, managing the physical environment, positioning, non-nutritive sucking, kangaroo care, clustering of care, temperature control and pain management.

Why is developmental care important?

- Babies' brains develop rapidly at birth until three years of age. When babies are born prematurely brain development that occurs in the womb becomes disrupted.
- Premie and sick babies are very sensitive to over stimulation, which causes babies to become too active or excited. Types of over-stimulation include:
 - Too much noise
 - Too much handling or being passed on from person to person
 - Being moved suddenly or bounced/rocked too vigorously or for too long
 - Visual input, such as watching TV or any screen

When you notice signs of over stimulation such as crying, changes in colour, being too quiet, having a panicked look, hiccups, stop the stimulation and provide gentle rocking and a quiet environment.

- Developmental care promotes a stable and well-organized infant so that he or she can conserve all energy for growth and development.
- What are the benefits of developmental care?
 - Faster weight gain
 - Better oxygenation
 - More stable heart rate
 - Better stomach emptying after feeds
 - Sooner discharge home

Understanding your premature baby

What kind of behaviour and/or physical attribute can you expect at your premature baby's developmental age?

28 – 30 weeks

- Normal heart rate of 120-160 beats/minute
- Normal breathing rate of 30-60 breaths/minute
- May require mechanical ventilation due to lung immaturity
- Sensitive to and easily disorganized with handling, noises, and light
- May have frequent or occasional apneic or bradycardic spells
- Body posture is floppy and arms and legs are often extended versus flexed
- May begin to respond to soft noises and familiar voices
- May appear to have jerky movements when disturbed

30-33 weeks

- Normal heart rate of 120-160 beats/minute
- Normal breathing rate of 30-60 breaths/minute
- May have frequent or occasional apneic or bradycardic spells
- Body posture becomes more controlled (moving and flexing of arms and legs)
- Continues to be startled when disturbed
- More organized but still may tolerate only minimal handling
- Awakes more often for feeding
- More periods of being awake and alert (usually at 32 weeks)
- Eyes begin to open more often and can slightly focus on faces for short periods of time
- Begins to recognize voices; may still become disorganized to other noises

33 – 36 weeks

- Normal heart rate of 120-160 beats/minute
- Normal breathing rate of 30-60 breaths/minute
- May have frequent or occasional apneic or bradycardic spells
- Able to better control temperature
- Hands and legs appear flexed when sleeping and actively kicking when awake
- Able to move head from side to midline
- Begins to suck more on hands and soothers and may begin to nipple feed
- Sleeps more soundly (distinguish sleep/awake cycles)
- More organized with regards to sounds and may become disorganized with handling
- Eyes are still uncoordinated but can follow objects horizontally at 35 weeks

- Capable of interacting socially (may become over-stimulated with multiple social interactions)

36 – 40 weeks

- Normal heart rate of 120-160 beats/minute
- Normal breathing rate of 30-60 breaths/minute
- Should be able to maintain body temperature
- May have frequent or occasional apneic or bradycardic spells
- Baby sleeps well with extremities in a flexed position
- Has recognizable sleep/awake cycles
- Is more interested in socializing, especially with parents and/or caregivers
- Has noticeably more alert states
- Interested in seeing faces (able to visualize 8-10 inches from his or her face)
- Enjoys the sound of voices but may become disorganized with prolonged and loud noises

Learning your baby’s cues

Cues are signals or behaviours that your baby shows what he or she is feeling. Learning to understand what your baby is saying by the way he or she is acting will help you care for your baby and help him or her cope with stimulation. Here are some things to watch for to assist you in identifying appropriate times to interact with your baby and when to stop because he or she might be over stimulated.

Approach signals: “I am happy and ready to interact.”

Quiet and alert	Relaxed limbs
Relaxed facial expression	Smiling
“Ooh” face (shape of mouth)	Cooing
Smooth body movements	Able to focus
Clasp hands together	Eye contact
Sucking on fingers or hand	

If your baby demonstrates any of the approach signs it indicates that he or she is ready for interaction.

Stress signals: “I am not happy and need a change.”

Saluting	Yawning	Colour change	Grasping
Sneezing	Looking away	Frowning	Arching
Eye closing	Grimacing	Hiccoughing	Grunting
Gagging	Tongue thrusting	Staring	Spitting up
Crying	Whimpering	Passing gas	Irritability
Stretching	Fingers spread apart		

It is important that once you have identified the negative stimulus, try to reduce it. Also pay attention to the type of environment that your baby is being exposed to such as rocking, patting, singing, brightly lit room, television, and radio.

You may also see some of these signs as a result of a natural physiological process or medical condition instead of in response to environmental stress. Please feel free to ask your baby’s nurse if you are unsure how best to respond to his or her cues.

Your baby’s behavioural states

How your baby reacts to what is going on around him or her will depend a lot on the state of sleep or wakefulness he or she is in.

Sleep states

Deep sleep (also called quiet sleep or non-REM)	<ul style="list-style-type: none"> • Baby is very still • Occasional startles or sighs • More restful stage of sleep and important for growth
Light sleep (also called active sleep or REM)	<ul style="list-style-type: none"> • Baby may move quite a bit • Makes little noise • Breathing is uneven Flutter eyelids • Eyes may open briefly or be kept slightly open for long periods of time
Sleep/awake	<ul style="list-style-type: none"> • Moves quite a bit as beginning to wake up May grunt and open eyes briefly • May go back into light sleep several times before really waking up

Wake states

Drowsy	<ul style="list-style-type: none"> • Eyes open and close (looking as though he or she can hardly stay awake) • Eyes may be open but baby has a “dazed” look • There is not much movement • Baby can either become alert or go to sleep. Hold or stay near them and wait to see if they are sleepy or re-alerting.
Quiet alert	<ul style="list-style-type: none"> • Awake but quietly looking around or staring at one point • Eyes are open • May have some movement of limbs • Baby is ready to interact, feed, do tummy time or play in this state
Active alert	<ul style="list-style-type: none"> • Limbs are moving vigorously • Baby might cry out or cry for 10-20 seconds • Looking around head movements • Baby might be signaling that they are getting hungry or need some comfort or interaction to self-regulate
Crying	<ul style="list-style-type: none"> • Baby is actively crying for more than 30 seconds • Attend to baby’s need whether it is feeding, comforting, changing diaper or investigating if he/she is in pain

As your baby reaches 30 weeks, he or she will become alert only for a very short time. As your baby grows, the time spent in the alert state gradually increases and this is another sign that the brain is growing well. Being alert helps your baby attend to (think about) what he or she sees.

This is very important for learning, interacting with people, and social development.

Touch in the NICU

Positioning

Positioning in the NICU is important for your baby’s growth and development because:

1. Your baby was born prematurely so his or her nervous system has not fully developed yet, which often makes him or her feel disoriented.
 - To help your baby feel organized and calm:
 - Bring your baby’s hands together in front of his or her body close to the mouth or face.
 - Make sure his or her legs are together in a flexed position.

- Bundle your baby in a flexed position with his or her arms centred and making sure there is enough space for short arm excursions, especially hand to hand and hand to mouth.
- As your baby reaches closer to full-term, bundling your baby is not as important as he or she will start to move his or her arms and legs more.
- Bundling your baby during a painful or stressful procedure is comforting.



2. During pregnancy, babies grow and develop inside their mother’s womb. As babies reach closer to full-term, there is less room in the womb for the babies to move and stretch out, so they are often in a flexed, curled position.

Since your baby was born prematurely, he or she will not have that flexed, curled position called “physiological flexion.” This physiological flexion is important for the development of normal body movement and control. Therefore, when possible we try to replicate positions experienced in the womb in the NICU.

- To help support developmentally appropriate positioning:
- When your baby is lying on his or her back ensure the head is supported in midline with hands free and close to mouth or face, shoulders are rounded forward and legs are flexed and together with boundaries for foot bracing.
- When your baby is lying on his or her side ensure the shoulders are rounded forward, legs are flexed with boundaries for foot bracing, and hands are free and close together near face or mouth. The trunk and neck should be in soft flexion.
- When your baby is lying on his or her tummy ensure his or her shoulders are rounded and fall forward by using a roll to support the head, hands are free and close to mouth or face, and legs are tucked together under the body and supported with boundaries.
- We use rolls and blankets to form a nest around your baby.
- We try to change your baby’s position every three-four hours.
- Alternating sleeping positions also helps to prevent head flattening.

What are the benefits of early positioning?

- Promote calm and regulated behavioural state
- Enhance normal sensorimotor experiences
- Prevent maladaptive movements and counteract abnormal postures
- Prevent abnormal walking patterns
- Prevent head flattening

- Prevent head turn preference

Handling

Premature babies are sensitive to being handled because of their immature nervous system. When your baby is handled for medical care, he or she may often show that this is physiologically stressful by the following signs:

- Rising heart rate or dips in heart rate
- Rising respiration rates or periods of holding breath
- Falling levels of blood oxygen levels
- Colour changes to dusky or flushed
- Yawning or hiccups
- Moving limbs more
- Jerky movements
- Startles and tremors and fussing / crying

To help make handling less stressful for your baby, we hold and bundle your baby in a way that supports a fetal position. We also pace the care according to how your baby reacts.



Touch

Premature babies react in different ways to different kinds of touch.

- A back and forth touch like light stroking, a feathery touch can be too much for a premature baby.
- Premature babies prefer a constant, firm but gentle touch.
- Babies are ready for neonatal massage at 32-33 weeks of gestational age. Prior to this age skin-to-skin is an appropriate input of touch.
- Skin-to-skin holding (also called kangaroo care) is a very positive way to touch your premature baby.
- Allowing your premature baby to grasp your finger so he or she can hold it, especially when feeding, is very calming and organizing.

Kangaroo care

What is kangaroo care?

Kangaroo care is a way of holding a baby so that there is skin-to-skin contact with the parent. In kangaroo care, a baby typically lies against their caregiver's bare chest wearing only a diaper. It

is often used to help form the special mother-baby bond following sudden separation during the birth experience. Kangaroo care is important for fathers, too!

Why is kangaroo care important?

When your baby is skin to skin he or she will hear your heart beat, smell your personal scent and hear your voice. All of these are familiar to your baby and promote a less stressful environment for him/her to grow. It can also help with parent-infant attachment and bonding.

What are the benefits of kangaroo care?

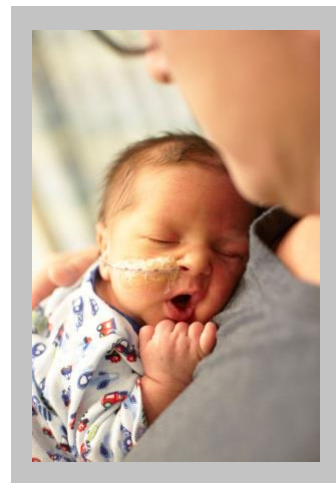
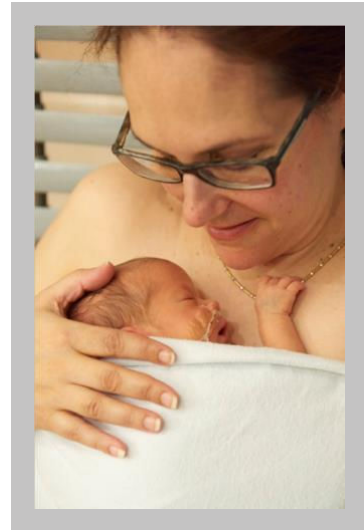
- More stable and regular heartbeat
- More relaxed and even breathing
- More steady blood oxygen levels
- Keeps temperature normal
- Better sleep
- Promotes a more alert and calm baby when he or she is awake
- Better weight gain
- Greater conservation of calories needed for growth and development
- Decreases length of hospital stay
- Increases breast milk production if you are breastfeeding

When can I start kangaroo care?

As soon as your baby is stable enough to hold, you may start kangaroo care. We strongly encourage this special type of holding at least once per day. The wonderful thing about kangaroo care is that you can continue it even after you are home.

How do I provide kangaroo care?

- This type of holding your baby usually begins before a feeding and continues for the duration of the feeding. Talk to your nurse about how kangaroo care is done.
- You will hold your baby for at least one hour and up to three hours.
- Use the bathroom before kangaroo care.



- Mom or dad will open his or her shirt. (Button-down shirts work well and can be left at the bedside. Mom will want to remove her bra.)
- A standing transfer is easiest for the baby. The nurse will initially assist you in preparing the baby for transfer. He or she will place a blanket under the baby and secure any tubes that may be necessary. You will stand next to the baby's isolette, place your hands under the blanket, and draw the baby toward your chest while the team assists you with maintaining secure tubes and lines. Once you have the baby secure against your chest, you can step backwards toward the chair and sit. Alternatively, the nurse will place your baby on your chest after you sit down. Some units may have special chairs designed just for kangaroo care.
- Your baby will be covered snugly with a blanket.
- Do not wear chains or necklaces.
- No loud conversations with visitors should take place during this time.

For the safety of your baby, do not sleep while holding your baby. Your nurse will check on you and your baby frequently during kangaroo care. Use of cell phones is not recommended during your visit in the NICU.

Non-nutritive sucking

During tube feedings or other procedures, we may offer your baby a soother (pacifier) to suck on. This is called non-nutritive sucking (NNS) and has many benefits for babies in the NICU. Often we start oral feeding with non-nutritive sucking as well in order to prepare your baby's oral motor, sensory and postural systems to start breast or bottle feeding.

What are the developmental benefits of NNS?

- Promotes normal development and positive feeling to the mouth.
- Helps your baby learn how to self-soothe.
- Helps comfort your baby.
- Decreases time in fussy and awake states.
- Decreases length of hospital stay.
- Decreases heart rate.
- Increases oxygenation.
- Helps cope with a stressful or painful procedure.
- Minimizes hypersensitivity.

Why is sucking on a soother important for my baby's development?

Your baby may require necessary medical and nursing procedures such as use of breathing supports, feeding tubes, and suctioning that can be very uncomfortable. When this occurs over a long period of time, your baby may become hypersensitive around the mouth. This hypersensitivity means that taste and putting fingers/pacifier in the mouth can be unpleasant to your baby. As a result, he or she may avoid using the mouth for exploration and learning which is important for feeding, self-soothing, and development.

We offer every baby a soother from the time he or she is admitted to the NICU. Offering your baby a soother during painful and stressful procedures is part of our routine care in the NICU. During unpleasant procedures, the pacifier can help soothe and calm your baby.

For more information about how NNS can help your baby to feed more effectively, please see the "feeding your baby" chapter.

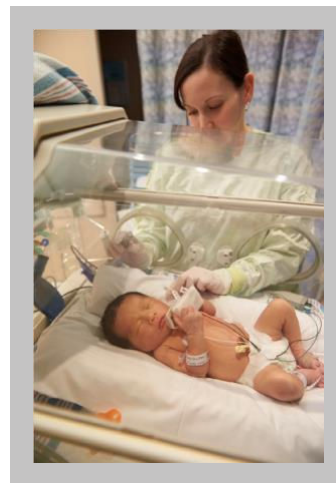
Pain management

Pain management is an important part of care in the Neonatal Intensive Care Unit (NICU). While your baby is in the NICU, the doctors and nurses are doing everything they can to make sure your baby is comfortable and not in any pain. Although it is natural for you to be worried that your baby is hurting, there are many ways to prevent pain and make potentially painful procedures more comfortable.

How do we lower pain without using medications?

Non-pharmacological pain management is lowering pain without using medicine. This includes:

- Swaddling the baby snugly in a blanket.
- Holding the baby skin to skin, also called kangaroo care.
- Offering the baby a pacifier to suck on.
- Letting the baby nurse at the breast before, during, and after a painful procedure.
- Keeping the baby distracted with rocking, gentle touch, soft sounds, and low light.
- Giving the baby a solution of sugar water on their tongue or on a pacifier.



If your baby's medical team thinks that a procedure, they need to do will cause more pain, they can use many safe and effective medications to help relieve that pain. This includes everything from applying numbing cream to the skin to offering medicines to stop the pain.

If you're worried that your baby is in pain, you can ask the NICU nurses to help you learn how to tell if your baby needs something (Is your baby hungry? Does he or she need a diaper change?) or if he or she is hurting. After going home, you can continue following these tips to help your baby if you think he or she is in pain:

- Wrap your baby in a blanket to provide comfort and to help him or her feel safe.
- Give your baby a pacifier or offer breastfeeding.
- Provide skin-to-skin care by holding your baby with their bare skin up against yours (kangaroo care).
- Keep lights and noise down to provide a calm environment.
- Talk to your baby's provider about medicines that can help with pain.

Skin care

Your baby's nurses will look at your baby's skin to make sure it is not broken or red. Your baby has very fragile skin that has to be touched gently. As your baby gets older, his or her skin will not be as fragile. Talk with your baby's nurses about ways to move your baby to protect his or her skin.

It is important to always wash your hands with soap and water for at least 15 seconds when you enter the NICU and when your hands are visibly dirty. You may also use alcohol-based hand rub but make sure you rub it all over your hands and between your fingers. It is best to keep your fingernails short. You should also clean your hands after changing your baby's diaper and before you make your baby's bottle. Washing your hands will help prevent your baby from getting an infection. Those caring for your baby will be doing this, too.

Your baby's nurses will tell you about the different things that they will do to or use on your baby's skin. The nurses will also show you how you can help take care of your baby's skin.

Bathing

You may see your baby's nurses clean the bathtub before and after a bath. This is done to help prevent infection. The soap you use on your baby should be fragrance-free to help protect his or her skin. You do not need to give your baby a bath more than once every few days. By not bathing your baby every day, you are helping to keep his or her fragile skin safe and not dried out.

Vernix

Your baby may have a white, cheesy covering on his or her skin called vernix ("ver-nicks").

This is normal and is a natural covering to keep your baby's skin moist and free from infection. Sometimes this covering is left on your baby's skin. It is not necessary to scrub this covering off of your baby's skin. This can hurt your baby's fragile skin. Instead, the covering is left in place until it comes off by itself.

Cord care

After your baby is born, the umbilical cord is clamped and cut, leaving a stump. If it becomes dirty, this stump can be cleaned with water and dried well. It is not necessary to use alcohol wipes to clean the cord. The best way to keep your baby's cord free from infection is to make sure that it does not get dirty from your baby's diaper. You should fold the front of the baby's diaper down when changing him or her to make sure the stump does not get wet. You should also look at the cord daily to make sure it is not red or warm or has any drainage or bad smell. These are signs of infection, and you should tell your baby's providers or nurses when you see them.

Cream to protect your baby's skin

When your baby's skin is too dry, it can crack more easily. Talk with your baby's nurse or medical provider about creams or lotions that can be used on your baby's skin. Many babies need a cream applied to their buttocks to prevent or treat diaper rash.

Water loss

Your baby's skin is very thin and fragile. Because of this, your baby's skin can dry out very easily. Remember that your baby can get cold very easily. Your baby might have been placed into an isolette, which is a special "house" that keeps your baby warm and lets the nurses keep track of your baby's temperature. Sometimes when your baby is in the isolette, the nurses will keep the air humid inside of it. This also helps keep your baby warm and your baby's skin moist.

Keeping your baby free from infection

Your baby may need to have his or her skin cleaned with a special cleansing agent before certain procedures are performed. You may see your baby's skin cleaned with different types of

cleansing wipes. This helps protect your baby from an infection. Feel free to ask any questions that you may have about the special cleansing agents or the procedures being performed.

Tape

You may see your baby's nurses use different kinds of tape on your baby. The nurses may put a protective piece of tape on your baby's skin and then put another kind of tape on top of that. This helps to keep your baby's skin intact. Since your baby has very fragile skin, the nurses will help keep it safe with different kinds of tape. When the nurses remove the tape, they will do it slowly and may use water to keep your baby's skin from breaking. Your baby's nurses may also leave the tape in place even though your baby may not need it anymore. This is because your baby's nurses are waiting for the tape to come off by itself. This will help keep your baby's fragile skin intact and protect your baby from getting an infection.

For baby boys

You may or may not decide to have your baby boy circumcised (sir-cum-sized). This procedure is used to remove skin at the tip of the penis.

If you choose to have your baby boy circumcised, make sure that you cover the penis with a petroleum product (such as Vaseline®) and gauze with each diaper change for as long as your baby's nurses tell you to do so. Sometimes, depending on how your baby's provider performed the circumcision, your baby's nurses may tell you not to use petroleum and gauze on your baby. Be sure to ask questions about caring for your baby's circumcision. For circumcised boys, the tip of the penis may seem raw or yellowish. When gauze is used, it should be changed with each diapering to reduce the risk of infection. Use petroleum jelly to keep the gauze from sticking to the diaper. Sometimes a plastic ring is used for circumcision. This should drop off within five–eight days. It may be recommended that you use petroleum jelly on the tip of the penis with either procedure to keep the foreskin lubricated; be sure to follow the instructions from the hospital. The penis should be fully healed about seven–10 days after circumcision.

For an uncircumcised penis, you should not pull the skin down to clean around your baby's penis. This can cause your baby's skin to tear. Instead, leave the skin in place and gently clean around the penis if needed.

Diaper rash

Diaper rash is when your baby has redness and irritation around his or her buttocks. To prevent a diaper rash, frequently change your baby's diaper, especially after they poop. To care for a diaper rash, clean the area with soft cloths and water. You can also clean the area with diaper wipes that are chemical-free (i.e. alcohol- and fragrance-free). Your baby may also have a special cream that should be applied each time the diaper is changed. Sometimes, your nurses will tell you not to wipe off all of the cream, but to only gently wipe around the buttocks. This will keep your baby's skin intact and allow it to heal.

Other skin information

Depending on how early your baby was born, you may see your baby's nurses use special techniques to keep your baby's skin from tearing, including placing special pads underneath your baby or placing clear coverings on your baby's knees or elbows. Ask your baby's nurses about ways you can help keep your baby's skin from tearing.

Temperature control

Babies can sometimes have a hard time keeping their temperature in the normal range. Fullterm babies have a layer of fat under their skin that helps them stay warm. When babies are born early, they don't have as much fat under their skin.

Right after birth, your baby can get cold really fast. The best way to keep your baby warm is to dry your baby; give your baby a warm, dry bed; and place a hat on his or her head.

How do we keep premature babies warm in the NICU?

In the NICU, one of the beds that can be used is called a radiant warmer. It is like an open crib, with a heater on it that helps your baby stay warm. Another bed your baby may use is called an isolette or incubator. This gives a preemie or sick baby extra heat to help keep his or her temperature where it should be.

When your baby is older and bigger, he or she can be dressed in clothes or a t-shirt, wrapped in a blanket, and put in an open crib or bassinet. This is one of the milestones along the journey to go home.

It is also important to make sure your baby doesn't get too warm. Dressing your baby in too many clothes, covering your baby in too many blankets, or covering your baby's face can make him or her too warm.



Things to remember when going home:

- If your baby's body temperature is lower than 36°C (97°F), undress your baby, place him or her skin to skin on your chest, wrap yourselves in blankets, and call your baby's provider. You should also call your baby's health care provider if your baby's temperature is higher than 38°C (100.4°F).

- If your baby's hands or feet are cool or look pale or blue, warm them with a blanket. You can also add a layer of clothing. If the colour of your baby's hands and feet does not improve, call your baby's health care provider.
- Dress your baby in layers. To avoid overheating, add only one more layer of clothing than you are wearing if the temperature is cool, and remove a layer of clothing if your baby is warm. Use sleepers when you can.
- Remove clothes when they are wet or dirty.
- Keep your baby away from drafts and windows as much as possible.
- Keep the crib away from drafts, windows, and outside walls by placing your baby's crib on the inner wall of the room.
- Always place a hat on your baby when you go outside in cool or windy weather.



Babies can be dressed in layers, but no more than one additional layer than you are wearing.

Managing the physical environment

To make your baby's surroundings feel more comfortable, we try to:

- Reduce noise
- Reduce light
- Put your baby in a comfortable flexed position
- Disturb your baby as little as possible
- Try not to wake your baby if he or she is sleeping

To reduce noise, we try to:

- Talk quietly
- Place a cover on top of the incubator
- Place things gently on top of the incubator
- Open and close the incubator doors quietly
- Remind people to be quiet when your baby is sleeping

- Reducing noise level is important as loud sounds may be stressful for the baby causing physiological changes in heart rate, breathing, apnea, and drop in oxygen levels and damage the baby's ears leading to hearing loss

To reduce light, we try to:

- Turn down the lights over your baby's incubator
- Use a special mask to cover your baby's eyes during phototherapy
- Reducing light is important as exposure to constant bright light may cause injury to the eye, slow the normal development of sleep-awake cycles, and affect the level of arousal of your baby (keep your baby from opening his or her eyes and looking around)

Are any sounds good for my baby?

The sound of your voice and reading to your baby may be the one way to provide sound that will calm your baby. Sometimes playing quiet music can be calming for your baby. It is important for you to watch your baby's reaction to the music to be sure that he or she likes it.

CHAPTER 4: FEEDING YOUR BABY

You will learn a lot about feeding your baby during his/her stay in the NICU. You play an important part in your baby's feedings.

Breast milk, pasteurized donor human milk, and/or specialized formulas are the choice of feeds for babies in the NICU depending on your baby's needs. If your baby is not yet feeding by mouth, his/her feeds may be given through a tube that goes into the mouth or nose and ends in the stomach. Babies will be given small amounts of expressed milk oral immunotherapy (O.I.T) by syringe or pacifier. Sucking on a pacifier gives your baby practice for either breastfeeding or bottle feeding. Never force the pacifier into your baby's mouth.

Feeding should always be a happy and positive time for you and your baby. If your baby is not ready to drink from your breast or bottle, there are other things your baby can do. Your baby can rest his or her mouth at your breast if you want to breastfeed. Your baby can rest his or her body skin to skin with mom or dad during the tube feeding.

Non-nutritive sucking

As noted in the previous chapter, during tube feedings, you may offer your baby a soother (pacifier) or finger to suck on. This will help your baby associate sucking with being fed and having his or her tummy full. Research shows that non-nutritive sucking (NNS) is also important to help your baby practice his or her sucking skills and develop the muscles needed for effective feeding.

What are the feeding-related benefits of NNS?

- Encourages sucking development
- Helps your baby transition from tube to oral feeding earlier
- Promotes normal development and positive feeling to the mouth
- Helps your baby learn how to feed
- Helps your baby tolerate feeds better
- Establishes earlier breast/bottle feeding
- Improves weight gain

Your baby has to learn how to coordinate sucking, swallowing, and breathing when eating. Your baby may not begin to learn how to do this until they are close to 34 weeks gestation. The nurses, lactation consultant and the occupational therapist in the NICU will work with you to teach you how to feed your baby safely. You will also learn about feeding readiness. If your baby is stable, you and the nurse will decide if your baby is showing signs of interest to orally feed.

If your baby has problems during breastfeeding, the nurse will call a lactation consultant who may be able to help. If you or your nurse are concerned with how your baby is orally feeding, an occupational therapist may be asked to assess your baby for further support and intervention.

Once oral feedings are started, it will be very important for parents to visit as much as possible. We will help you identify your baby's readiness to orally feed. Your baby will progress at his/ her own pace. The number of opportunities for oral feeding will be offered based on your baby's readiness cues. Most babies are very inconsistent in the beginning.

For more information about how NNS can help with your baby's development, please see the "development and comfort care" chapter.

Breastfeeding your baby

Breast milk is the ideal food for your baby. Here at North York General Hospital breastfeeding is promoted. Your breast milk meets the specific nutritional needs of your baby.

Even though your baby may not be ready to breastfeed, your body's natural response to childbirth will make your breasts fill with milk at about 48-72 hours after birth. If you empty your breasts, by breastfeeding or expressing the milk (by hand or using a breast pump), your body receives a message that more milk is needed. If you leave your breasts full, your body receives a message

that no milk is needed and within three to five days, your milk will begin to decrease. Breast milk works on demand and supply.

Benefits of breast milk

Benefits for your baby	Benefits for you	Benefit for society
<ul style="list-style-type: none"> • Lower risk of stomach, respiratory, and ear infections Lower risk of allergies Lower risk of sudden infant death syndrome (SIDS) More easily digested • Something special only mom can provide 	<ul style="list-style-type: none"> • Less bleeding after childbirth • Faster weight loss Lower risk of breast, ovarian, and uterine cancer Stronger bones • Less costly than formula 	<ul style="list-style-type: none"> • Reduces healthcare costs • Environmentally friendly

What is colostrum?

- Early milk produced in the first three-four days post-delivery
- Colour may be clear, bright yellow, white, orange, pink, green or light brown
- Helps protect baby from viruses and infections by “painting” the lining of the stomach and intestines

How to establish your milk supply

Hand expression should be started within the first hour and pumping should be started within the first six hours of your baby’s birth. Hand expression and pumping should continue every three hours. As milk supply comes in with pumping the hand expression can be discontinued. Pumping every three hours will continue. Milk supply can take three to five days to come in. Milk production is based on frequent breast stimulation and emptying.

Breast pumping

If you are planning to breastfeed your baby, the NICU staff will support you with your decision. Electric breast pumps are available for use in the NICU. Please ask your baby’s nurse about how to get a breast pump to use while you are visiting the NICU. If you do not have a pump at home and would like to rent one, ask your baby’s nurse or lactation consultant about pump rentals information.

Tips to help establish adequate breast milk supply

- Use an electric breast pump with double pump kits. NICU staff will provide you with the double pump kit and sterile collection containers (for breast milk storage).
- Ask your nurse about kangaroo (skin-to-skin) cuddling your baby prior to pumping.

- Pump your breasts at your baby's bedside.
- Apply warm compresses to the breasts and do some circular massage, massaging the milk toward the areola for two-three minutes.



- Gentle compression of the breast and ducts is beneficial prior to, and halfway through, the pumping. This will increase milk volume and promote thorough breast emptying.
- Center the clean breast flanges over both nipples.
- Begin pumping in the initiate function with a suction of three to four. When the pump changes to a longer pulling the suction can be increased to a comfortable setting.
- Pump for 15 minutes. If in the initiate function the pump will automatically stop at 15min. On day six or if 20ml is obtained on three consecutive pumps the maintain function can be started. The maintain function does not have a set timer. Pumping for 15 to 20 minutes is suggested. Pumping for long periods of time after your milk flow has stopped will only make your nipples sore – not more milk. Use a pillow behind your back for support when you pump – stiff back, neck, and shoulders are common because of the tendency to lean forward while pumping.
- Drink fluids each time you pump and in between.

Production of milk volumes

- Adequate supply: 500ccs to 750ccs per day (by two weeks)
- Abundant supply: > 750ccs per day (after two weeks)

Aim to intentionally over-produce your milk supply during the first few weeks. If your milk volumes are slightly lower than this but increasing daily, that is okay too. If you have any questions, please ask your nurse or lactation consultant. Once you have achieved an abundant breast milk supply (750ccs or more per day) your pumping schedule may be modified in consultation with the lactation consultant.

Pumping and discharge

- We suggest you pump until your baby is feeding well from your breast.

- Indication to wean from pumping: baby empties one breast and takes a little from the second breast consistently, with proper weight gain, the right amount of wet and dirty diapers, and is satisfied after feeds.
- Wean from pumping gradually, the lactation consultant will support pump weaning and give options and make an individualized plan to meet the feeding goals.

Options to increase your milk supply

Some women experience a decrease in milk supply with long term pumping (usually at four-five weeks). To increase your milk supply, plan to:

- Increase your pump schedule to 10-12 times/day
- Rest as much as possible
- Drink after each pumping
- Follow a balanced diet
- Changing pumping patterns-the lactation consultant can give support as needed
- Consider using herbs/supplements. The lactation consultant can give education and information on natural supplements.
- Consider using Domperidone, a prescription medication. Please speak with the lactation consultant for more information and then discuss this option with your family doctor.

Breast care

During the first week of nursing, your nipples may be tender. They should improve each day. Here are some tips to care for your breasts:

- Ensure a deep latch. This is very important to avoid sore nipples.
- Wear a well-fitted bra (not too tight) and avoid underwires.
- After nursing, express milk onto nipples and allow them to air-dry – this will assist with healing.
- Shower/bathe daily. No other cleaning is recommended prior to feeding.
- Avoid soap on your nipples.
- Use nursing pads that do not have a plastic backing.
- Change feeding positions frequently to decrease pressure on sore spots.
- When unlatching your baby, break their suction with your finger, then remove baby.

Storage and transportation of expressed breast milk

- Storage and transportation of expressed breast milk (EBM) should be pumped into the sterile bottles provided.
- When filling containers, leave an inch at the top to make room for milk to expand during freezing.
- Label each breast milk container with the date, time of pumping, and volume pumped. Mom's name will already be on the preprinted labels. Ask your nurse or unit secretary to print more labels when you require more.
- Discard breast milk containers without labels or labels that cannot be read.
- If transporting EBM from home, place containers of cold EBM in a zip-lock bag, and place in an insulated bag or cooler with ice packs.
- Please note that slightly thawed or "slushy" breast milk cannot be re-frozen. Use it within 24 hours or else discard it.

EBM needs to be stored in the fridge or freezer as follows:

- Room temperature (closed container): into the fridge as soon as possible however could be left at room for maximum of four hours
- Refrigerator: 48 hours (When baby is in the hospital. When baby is home 2 to 5 days)
- Thawed milk in fridge: 24 hours
- Fridge freezer with a separate door: two-three months • Deep freezer: six months
- **Defrosting milk:** Place on counter and/or in cup of cool water. When it reaches slush consistency, place in the fridge.
- The nurse may thaw your EBM using the milk warmer at your baby's bedside.

Learning how to breastfeed

Relax, hold, and position

Relaxation and positioning of you and your baby are some of the keys to successful breastfeeding. Good positioning helps to ensure that your baby will transfer milk from your breast to baby. You may need help with finding a comfortable position.

Start by washing your hands, and finding a comfortable place to breastfeed. Your back, feet and arms should be well supported. A chair with arms and a footstool will help to give support. You may find that you will be more comfortable if you remove your bra. Place pillows on your lap and under your arms to help lift the baby to the breast. Your baby must be supported at the level of your breast lifting the baby up during the feed will tire your arms. Have your baby's tummy facing your body and bring your baby in close. Tuck baby's lower arm under the breast to keep it out of the way.



Support your breast with your free hand. Place your fingers under the breast with the thumb on top, well behind the areola (the brownish area). Gently squeeze your fingers together. This will assist the baby to latch on in the early days. If the breasts are large, if the nipples are flat, if the baby has a weak suck, or if it feels more comfortable, keep supporting your breast this way during breastfeeding for as long as needed.



Ask for help as you decide which hold you would like to use. The cradle hold is used the most by women but may not be the easiest position to use when you and your baby are just learning to breastfeed. Some women find that the modified cradle or the football holds are easiest until the mother and baby learn how to latch on. The side-lying position is the best position for feeding when lying down. The football hold is a good position for a mother who has had a caesarean birth, has large breasts or flat nipples, or has a preterm baby.

Cross cradle

This position works well:

- When learning to breastfeed
- If baby has difficulty latching or maintaining a latch
- If baby is premature or small
- If baby has low muscle tone
- If baby has a weak rooting reflex or a weak suck
- This position allows the mother to provide maximum support for the baby's head while latching



Important points for proper positioning when using the cross-cradle position:

- Mother sits upright, preferably in a chair, with her back and arms well supported with pillows. A firm pillow is placed on her lap.
- If sitting in a chair, mother's feet are flat on the floor and not on the tip of her toes. A stool or phone book under her feet may help.
- Mother may use a pillow, or two, for additional support during breastfeeding. An extra pillow may be needed to raise baby to breast level. Baby is turned completely on the side so that baby's face, chest, tummy and knees are all facing the mother. The baby's chest is touching the mother's chest.

- Mother supports the base of the baby's head and neck with her hand opposite of the breast to be nursed on; her forearm supports the baby's back and buttocks (e.g. right hand/ forearm when nursing on the left breast).
- Mother supports the breast to be nursed in a "C" hold using the hand on the same side (e.g. left hand supports the left breast -see section on latching for diagram of the "C" hold, page 62).
- Baby's mouth is directly facing the nipple with the nipple pointed to the upper lip for an asymmetrical latch (i.e. There is more tissue below the nipple in baby's mouth). Mother brings baby to her instead of leaning over or pushing her nipple into baby's mouth.

Football

This position works well:

- When learning to breastfeed
- If baby has difficulty latching or maintaining a latch
- If baby is premature or small
- If baby has low muscle tone
- If mother has large breasts
- If mother has flat or sore nipples
- If mother had a caesarean birth
- This position allows the mother to provide maximum support for the baby's head while latching



Important points for proper positioning when using the football position:

- Mother sits upright, preferably in a chair, with her back and arms well supported with pillows. A firm pillow is placed at the mother's side, on the side to be nursed on.
- If sitting in a chair, mother's feet are flat on the floor and not on the tip of her toes. A stool or phone book under her feet may help.
- Baby is slightly turned towards the breast. Baby is tucked close to the mother's side and is directly under the breast. Baby's buttocks rest near the mother's elbow with his/her legs against the back of the chair or bed frame if sitting up in bed.
- Mother supports the base of the baby's head and neck with her hand on the same side as the breast to be nursed on; her forearm supports the baby's upper back (e.g. left hand/ forearm when nursing on the left breast).
- Mother supports the breast to be nursed on in a "C" hold using the opposite hand (e.g.

- right hand supports the left breast see section on latching for diagram of the “C” hold). Baby’s mouth is directly facing the nipple. Mother brings baby to her instead of leaning over or pushing her nipple into baby’s mouth.

Side-lying

This position works well:

- If mother finds it too painful to sit
- If mother wants to rest when breastfeeding (e.g. night feedings)
- If mother had a caesarean birth
- If mother has large breasts
- Mother will need help and practice when learning this position



Important points for proper positioning when using the side-lying position:

- Mother lies on her side with a pillow under her head and pillows behind her back so that she can lean back into them for support. A pillow may be placed between her legs for comfort especially after a caesarean birth.
- Mother positions baby on the bed parallel to and facing her body. Baby is turned completely on the side so that baby’s face, chest, tummy and knees are all facing and touching the mother. A pillow or small towel can be propped behind the baby to help him/ her to stay in a side-lying position. A pillow may be needed to be placed under the baby to raise him/her to breast level.
- Mother supports baby’s head, back and buttocks with her arm on the same side to be nursed on (e.g. right arm when nursing on the right side). The baby’s head can either rest directly on the bed or pillow, or on the mother’s upper arm. Once breastfeeding is well established and the baby is able to maintain a latch, the mother may remove her arm from the baby and place it under her head for comfort.
- Mother supports the breast to be nursed in a “C” hold using the opposite hand e.g. left hand supports the right breast (see section on latching for diagram of the “C” hold).
- Baby’s mouth is directly facing the nipple. Mother brings baby to her instead of leaning over or pushing her nipple into baby’s mouth.

Cradle

This position works well:

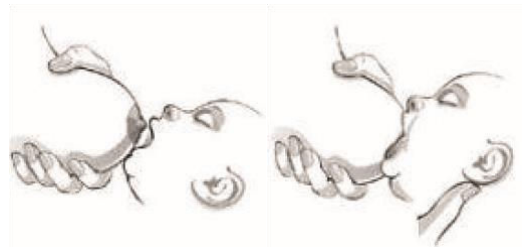
- After a mother is comfortable with breastfeeding and the baby is latching well. Important points for proper positioning when using the cradle position:
- Mother sits upright, preferably in a chair, with her back and arms well supported with pillows. A firm pillow is placed on her lap.
- If sitting in a chair, mother's feet are flat on the floor and not on the tip of her toes. A stool or phone book under her feet may help.
- Mother lies baby on the pillow in her lap. An extra pillow may be needed to raise baby to breast level. Baby is turned completely on the side so that baby's face, chest, tummy and knees are all facing the mother. The baby's chest is touching the mother's chest.
- Mother supports the base of the baby's head and neck in the crook of her arm using the arm on the same side to be nursed on; her forearm supports the baby's back and her hand supports the buttocks (e.g. left arm/hand when nursing on the left breast).
- Mother supports the breast to be nursed in a "C" hold using the hand on the opposite side
- e.g. right hand supports the left breast (see section on latching for diagram of the "C" hold).
- Baby's mouth is directly facing the nipple. Mother brings baby to her instead of leaning over or pushing her nipple into baby's mouth.



Wide mouth

Baby needs to open his/her mouth wide, with the tongue down and forward, before baby is latched onto the breast. Teach baby to open wide/gape:

- Express some colostrum onto your nipple to allow baby to taste and smell
- Move baby toward breast, touch their lips against nipple
- Move mouth away slightly
- Repeat until baby opens wide and has the tongue down and forward



As parents, you will be the ones feeding your baby once you go home. If you plan to have other caregivers help you at home, they need to come to the NICU with you to learn how to feed your baby. Once you are home, contact your baby's doctor for any feeding issues your baby might have.

Increasing nutritional content of feeds

Fortification in hospital: Human milk fortifier

Premature and/or low birth weight babies have special nutritional needs. While the nutrition of human milk is ideal for term infants; protein and mineral content of human milk is insufficient to meet the needs of some growing preterm infant. A human milk fortifier may be added to expressed breast milk (EBM) or donor EBM once the baby is tolerating an established amount of feeds. It is a cow's milk-based nutritional supplement powder or liquid that is mixed with expressed human milk to increase energy, protein, calcium, phosphorus, sodium and other nutrients that are needed to support growth and bone mineralization. Laboratory testing of your baby's blood will be done routinely to monitor their nutritional requirements.

Fortification may also be needed for babies with poor growth that do not qualify for human milk fortifier. This fortification may be done by adding formula to breast milk or, if breast milk is unavailable/inadequate, by increasing the concentration of formula. Feel free to ask the NICU registered dietitian for more information about fortification.

Fortification upon discharge:

Your baby's discharge feeding plan will be based on how your baby is feeding, what your home feeding plan is and what your baby needs to maintain adequate growth and development. Regular human milk and formula contains 20 calories per ounce, but your baby may require 22, 24, 27 or even 30 calories per ounce. Human milk fortifier is only available for hospital use. As such, the dietitian or physician may recommend adding formula to your breast milk or concentrating formula (if using formula alone) to promote adequate growth and continually meet your baby's nutritional needs at home.



Your baby's doctor will follow their growth once discharged from the hospital and make feeding recommendations accordingly.

Formula feeding your baby

You may choose or require supplementing your baby with formula. This section is meant to guide you through formula use.

Preterm formulas

The nutritional needs of premature and/or low birth weight infants are much greater than those of full-term healthy weight infants. Preterm formulas are commercially designed to provide specialized levels of nutrients to meet in-utero nutritional requirements for a growing premature infant.

Term formulas

If using a term formula, use an iron-fortified term formula until your baby is one-year post-menstrual age. It is also important to choose a formula that is fortified with essential fatty acids (Omega 3 and 6) for proper brain and eye development. This will provide the necessary nutrients your baby will need for growth and development. Proper formula preparation and storage is essential to reduce the risk of bacteria-related illnesses.

Formula preparation

Please consult with the dietitian for specific instructions on formula preparation. Below are general guidelines in preparing different types of formula at home from Health Canada.

<https://www.canada.ca/en/health-canada/services/milk-infant-formula/preparing-handling-powdered-infant-formula.html#:~:text=Boil%20water%20for%202%20minutes,C%20kills%20potential%20harmful%20bacteria.>

** When feeding formula to babies less than four months of age, the Canadian Paediatric Society and other authorities recommend that water should be brought to a rolling boil for at least two minutes then cooled before use for sterilization.*

Transitioning from enteral to oral feeding

Your baby's ability to orally feed is often the biggest milestone for discharge. Complex medical conditions such as prematurity, respiratory problems and developmental issues can delay this transition.

Oral feeding is work for your baby. Your baby must coordinate sucking, swallowing, and breathing during bottle-feeding. These processes must work together to result in safe and efficient feeding.

Bottle feeding can be a challenge. Some difficulties that your baby may encounter with bottle feeding are:

- Coordinating his/her breathing
- Handling the flow of liquid
- Tiring easily
- Spilling of liquid from corners of mouth
- Gulping, coughing and choking
- Poor lip seal
- Weak suck

Different types of supports are used to help babies with bottle feeding difficulties. If you are planning to bottle feed your baby, we start by using the the Dr. Brown ultra preemie nipple. After careful assessment we will recommend the appropriate nipple for use at home.

CHAPTER 5: ROUTINE TESTING AND MILESTONES

Newborn screening

All newborn babies will receive a newborn blood test to screen for rare, serious diseases. Early detection of these diseases through newborn screening prevents serious health problems and can save lives. Most disorders can be treated if found early, but not all disorders found during screening can be treated. The test requires the nurse to prick your baby's heel and apply a few drops of blood from the heel onto a special paper. Some babies who are born early may need to have another newborn screen a few weeks after the first screen. This does not mean there is a problem. The screening just needs to be repeated because the infant was born early.

The results will be sent to your baby's doctor a few weeks after the sample is taken.

An abnormal result means that the baby should have additional testing to confirm or rule out a condition. Your baby's doctor will speak with you and make arrangements for your baby to see a special doctor if needed. Remember, finding disorders early and getting proper treatment can make the difference between lifelong challenges and healthy development for your child.

You can find further information from the Newborn Screening Ontario website at:
www.newbornscreening.on.ca

Critical congenital heart disease screening

Critical Congenital Heart Disease (CCHD) is a condition that occurs when a baby's heart or major blood vessels have not formed properly. Some babies with CCHD are not identified by prenatal ultrasound or by physical examination after birth and can appear healthy. These babies are at risk of having serious complications within the first few days to weeks of life and require emergent care. Your baby's oxygen levels will be checked in the right arm and leg prior to discharge home to screen for CCHD.

CCHD screening is a quick and painless test that can detect low oxygen levels, a common sign of CCHD. If your baby is anticipated to remain in the NICU for less than seven days, a CCHD screen will be done at 24-48 hours of age. The results are available immediately. A positive screen result does not mean that your baby has CCHD but that further evaluation is needed to determine the cause of low oxygen levels. If your health care providers are concerned about your baby's screening results, they may order more tests and/or request that the baby be seen by a heart specialist. [000]

Hearing screening

Hearing is very important for the normal development of all babies. Even a small hearing loss in one ear can affect your baby's ability to speak and understand language. For this reason, all babies will have a hearing test before going home. The person who does the hearing screen in hospital will speak with you before doing the test to ask if there is a history of hearing loss in your family. This is also an opportunity for you to ask questions.

The hearing test is a painless procedure that is done when your baby is quiet or sleeping. This test measures how well the outer and inner ear work. The test takes about 10 minutes. Special probes or earphones are placed in or around both of your baby's ears and connected to the hearing screening machine. This will be used to test both ears.

The hearing test will determine if both ears can hear. If your baby does not pass the hearing test the first time, it will be repeated. If your baby is awake and moving too much or if your baby has fluid in his or her ears, the test will need to be repeated.

It is important for you to take your baby to all appointments with his or her doctor, as well as any hearing test appointments. Finding hearing loss early means a baby would have treatment earlier and reduce problems with language development.

Your baby's hearing continues to develop as he or she grows. Even if your baby has passed the hearing test in the hospital, you will still need to watch your baby's milestones of development. Some babies will require periodic hearing tests after they go home from the hospital. Talk to your provider about the milestones of development for hearing and talking.

Head ultrasound

An ultrasound scan of the head is done by placing an ultrasound probe over the soft spot on a baby's head (*fontanelle*).

Ultrasound is a safe, painless, non-invasive procedure that uses sound waves to take images of the brain.

A head ultrasound looks for bleeding inside the fluid-filled spaces of the brain (*intraventricular hemorrhage*). It also looks at changes in the brain tissue that can occur due to a lack of adequate oxygen or blood flow to the brain (*periventricular leukomalacia*). Babies who are born prematurely are at higher risk of these problems.

All infants who are born at less than 32 weeks gestation will have a series of ultrasounds. Even if your baby does not meet these criteria, the screening may be recommended due to other factors.



Retinopathy of prematurity testing

Retinopathy of prematurity (ROP) is a disease that can occur in premature babies. It causes abnormal blood vessels to grow in the retina, the layer of nerve tissue in the eye that enables us to see. There are varying degrees of ROP. Some are mild and correct themselves; others require treatment.

All babies who are born less than 31 weeks gestation or whose birth weight is less than 1250 grams (about 2 ¾ lbs) are screened for ROP. The first exam is usually done around four weeks of age. The examination is done by an ophthalmologist.

Immunizations

What are immunizations?

The diseases that immunizations (vaccines) prevent can be dangerous—or even deadly. Vaccines reduce the risk of infection by helping the body’s natural defenses develop immunity (or resistance) to disease.

When germs, such as bacteria or viruses, invade the body, they attack and multiply, causing an infection. The immune system (our natural system of defense) has to fight the infection, but once this happens, the fighting cells can remember that infection to fight it in the future. Vaccines help develop these fighting cells (immunity) by imitating an infection, but this imitation infection doesn’t cause illness. It causes the immune system to have the same fighting response as though it were a real infection, so the body can recognize it and fight it in the future. Sometimes, the vaccine can cause minor symptoms, such as fever. These minor symptoms are normal and should be expected as the body builds immunity.

What are some of the side effects of immunizations?

Like any medication, vaccines can cause side effects. The most common side effects are mild (such as redness and swelling where the shot was given) and go away within a few days. If your baby experiences redness, soreness, and swelling where the shot was given, you can ease those symptoms with a cool, wet cloth. Pay extra attention to your baby for a few days after vaccination. If you see something that concerns you, call your baby’s provider.

Immunizations in the NICU

While your baby is in the hospital, the NICU team will follow the vaccine schedule for your baby and make any necessary changes due to your baby being born early. Sometimes premature babies, especially those < 1500g may have spells after getting their first immunizations. All premature babies in the NICU will be monitored closely for a minimum of 48 hours.

The NICU team will give you information on the specific shots your baby needs that will explain the benefits and possible side effects of the vaccines. They will ask for your verbal permission before giving your baby any shots.

Going home

A vaccination schedule and a record of the immunization your baby received while in the hospital will be given to you before you go home. Immunization records will be needed for public day care centers and public schools. It’s very important that you make routine well-child appointments for your baby to see his or her provider. They will help you manage your baby’s immunization schedule. One of the best ways you can build your baby’s immune system is to follow up and ensure that your baby receives all of the vaccines and medicines recommended for his or her age.

Common vaccines given in the NICU

Pediacel®/Pentacel®: Provides protection against diphtheria, tetanus, pertussis, polio, and *Haemophilus b* infections. This is usually given at two, four, six, and between 12-23 months of age.

Prevnar 13®: Provides protection against *Streptococcus pneumoniae*, a bacteria that can cause bloodstream infections, pneumonia, and meningitis. This is usually given at two, four, and six months.

Hepatitis B vaccine: Provides protection against Hepatitis B, a virus that can cause liver disease. In Ontario, the hepatitis B vaccine is usually given at Grade 7 (http://www.health.gov.on.ca/en/pro/programs/immunization/docs/immunization_schedule.pdf), but it is given earlier to babies who are at risk of getting infected before then (for example, if mom or a caregiver are Hepatitis B carriers). http://www.health.gov.on.ca/en/pro/programs/immunization/docs/immunization_schedule.pdf

Other relevant vaccinations

Palivizumab (Synagis®): This is not a vaccine, but a passive immunization that will give babies the antibodies to protect against a common respiratory virus called RSV. Not all babies require this medication – only those who are highest risk of getting very sick from this virus will receive this shot.

Car seat safety

Car seat testing

The doctor may recommend a car-seat test for babies who have significant breathing problems or low muscle tone.

Your baby will be observed in the car seat. We will be ensuring proper positioning and monitoring of your baby's breathing pattern, oxygen levels and heart rate for one-and-a-half hours. If your baby is not able to maintain acceptable oxygen levels, trouble breathing or heart rate goes low:

- Your baby will need to stay in hospital longer.
- Your baby will be tested again 24 hours later.
- Your baby may need side rolls to aid in positioning.



How to choose the right car seat

Before your baby leaves the hospital, you'll need to make sure you have a car seat that is safe, the right size, and is installed correctly. The following are three important factors when choosing a car seat for a smaller baby:

1. Choose a car seat with a minimum weight of 1800 grams or 4 lbs.
2. Choose a car seat that has lower than average bottom harness slots (ideally 6 inches).

OR

3. Choose a car seat that comes with an insert cushion that raises the baby up so that the shoulder harness is at or slightly below the child's shoulder level.

Other important considerations:

- Make sure that the car seat meets current Canadian Motor Vehicle Safety Standards. All child car safety seats must have a (CMVSS) sticker on the seat.
- Check your child car seat for an expiry date. Manufacturers indicate the expiry date in the instruction booklet or on the child car seat. Transport Canada provides a list of manufacturers of car seats sold in Canada which includes the expiry/life date of their products at www.tc.gc.ca/eng/roadsafety/safedrivers-childsafety-notices.



- Always follow the manufacturer’s instructions for your car seat. Use a rear-facing car seat (one that faces “backwards”) until your baby is 9 kg or 20 lbs (usually at about one year of age).

How to safely install a car seat:

9. Before installing any car seat, read the manufacturer’s instructions as well as your car’s manual. If you don’t have the car seat’s instructions, contact the manufacturer for a copy (the address or phone number should be on the label on the car seat).
10. The back seat of the car is the safest place for children. Babies should be in a car seat that faces the rear (until the baby is 9 kg or 20 lbs) and is placed in the middle of the back seat of the vehicle. Never place your baby’s car seat in front of an airbag.
11. Follow the manufacturer’s instructions for your vehicle regarding lap and shoulder belts. Many combination lap and shoulder belts need a locking clip. Check your owner’s manual to see if this is necessary.

Placing your baby in the car seat:

- Place your baby in the car seat, then put the harness over the baby’s shoulders. Ensure that the harness straps are at or slightly below the baby’s shoulders.
- Make sure the baby’s back and bottom are up against the back of the seat. Bulky snowsuits, thick sleepers or blankets are not allowed. These items may interfere with tightening the harness properly to ensure proper safety for your baby.
- Make sure your baby’s clothes don’t get in the way of the strap that comes up between the legs.
- Tighten the harness. It should be tight enough to keep your baby safe. You should be able to fit one of your fingers between the shoulder harness and your baby’s collarbone.

Only items that came with your car seat may be used in the car seat, for example, head huggers or premie inserts. Items that did not come with your new child car seat may not be safe.

1. Car seat reclined according to manufacturer’s instructions
2. Retainer clip at armpit level
3. Harness comes through the seat at or below the child’s shoulders
4. Harness snug and flat Other things to remember:

Never leave your baby alone in a car seat.

- Use the car seat for travel only. Do not leave baby sleeping in car seat.



Courtesy of Susan Ise, BSN RN, and Alyssa Kendrick, BSN RN

- Try to avoid long car trips with a baby in a car seat. If you do make long trips, take a break at least every one-and-a-half hours and take your baby out of the car seat.
- Never use household carriers or feeding seats as car seats; they are not strong enough to protect a baby in a crash.
- Never use a car seat that has expired.
- Never use a car seat after it has been involved in a car crash (even if the baby was not in the car seat during the crash).
- Replace car seat if material on the seat is torn or damaged or if the shell is damaged.

Additional information

To learn more about child car seat safety or car seat recalls check online with Transport Canada or you can email (msv-sa@tc.ca) or call (1-800-333-0371). You can also visit www.safekidscanada.ca and www.caringforkids.cps.ca/handouts/car_seat_safety for more information.

CHAPTER 6: COMMUNITY RESOURCES

Paediatric health information

About Kids Health

The Hospital for Sick Children (SickKids) website that covers health issues from A-Z. There is also a multilingual section of the site.

[AboutKidsHealth](#)

Canadian Paediatric Society

This website from the Canadian Paediatric Society provides helpful articles from doctors on children's health, development and safety issues.

[Home | Caring for kids \(cps.ca\)](#)

Breastfeeding services

North York General Hospital, Newborn Follow-Up Clinic + Midwifery Care Clinic

- This clinic supports mothers and infants who can receive care and support from a nurse/midwife specializing in maternal/newborn assessments, breastfeeding, and health and wellness for mother and baby.
- 416-756-6410
- [Newborn Follow-Up Clinic | North York General Hospital \(nygh.on.ca\)](#)

Telehealth Ontario Breastfeeding Hotline

- Telehealth Ontario now offers new and expectant moms 24/7 access to expert advice and support for breastfeeding. The service is free and confidential and can be accessed in more than 100 languages.
- 1866-797-6000
- [The MoTHERS Program™ - Canadian Healthy Pregnancy, New Mothers and Babies](#)

Toronto Public Health Breastfeeding Clinics

- These breastfeeding clinics offer individual consultations by health care professionals prenatally and after the baby is born. At the clinic, families can have their baby weighed and their breastfeeding concerns addressed.
- 416.338.7600
- [Breastfeeding – City of Toronto](#)

Community health services

Hospital For Sick Children Emergency Department

555 University Ave, Toronto, ON M5G 1X8

416-813-5807

Open 24 hours per day, 7 days per week

North York Children's After Hours Clinic

1100 Sheppard Ave. East

416-250-5000

Evenings and Weekends

Walk-in

Scarborough Health Network

SHN General Hospital

Crockford Pavillion, First floor

3050 Lawrence Ave. E. (at Lawrence and McCowan)

[Kids After Hours Clinic – Scarborough Health Network \(shn.ca\)](http://shn.ca)

Children's After Hours Clinic

235 Danforth Avenue, Suite 100

416 -461- 3000

6-9pm weekdays, 10am-2pm weekends and holidays

Walk-in

The Just for Kids Clinic St. Joseph's Health Centre

30 The Queensway

416- 530- 6611

Use the “save my spot” request on website

CIBC Just for Kids Clinic - Unity Health Toronto

Richmond Hill Children's Clinic

250 Harding Blvd.

905-737-9898

Weekdays by appointment only

Weekends and Holidays by appointment only

[Contact Us / Hours – Richmond Hill Children's Clinic \(richmondhillchildrensclinic.ca\)](http://richmondhillchildrensclinic.ca)

College of Physicians and Surgeons of Ontario

- Find information here about all family doctors and specialists, including practice addresses, telephone numbers and qualifications.
- [CPSO - Find a Doctor](#)

Public Health

Public Health Departments offer numerous programs to new parents and babies. These may include: access to a public health nurse at home through the Healthy Babies, Healthy Children program; breastfeeding clinics and telephone support; parent groups and workshops; and more.

Toronto Public Health

- 416-338-7600
- [Healthy Babies Healthy Children – City of Toronto](#)

York Region Health Connection

- 1-800-361-5653
- [Healthy Babies Healthy Children Program | York Region](#)

Health811

- Free access to registered nurses, 24 hours/day, seven days/week.
- 811
- [Health811 - Health811 \(gov.on.ca\)](#)

Resources for parents

Canadian Premature Baby Foundation

- Provides information and support to parents of babies born prematurely
- Peer support group and webinars available
- [CPBF | Canadian Premature Babies Foundation | Canada \(cpbf-fbpc.org\)](#)

Dad Central

- A website and blog (Things Dads Do) which offer relevant parenting resources and community service information specifically tailored to fathers.
- [Home – Dad Central](#)

Multiple Births Canada

- Provides support and resources to the multiple birth community.
- 1.866.228.8824
- [Multiple Births Family Support | Multiple Births Canada | Canada](#)

Service Canada, Employment Insurance (EI) Benefits

- Information regarding Family Caregiver Benefit and maternity and parental benefits
- 1.800.206.7218
- [Employment Insurance benefits - Canada.ca](#)

Mental health supports

Postpartum Support Group - North York General Hospital

- Virtual group for new parents
- [Postpartum Support Group | North York General Hospital \(nygh.on.ca\)](#)

Postpartum Depression and Anxiety Supports in Toronto

- [Postpartum Depression & Anxiety – City of Toronto](#)

Fathers Mental Health

- [FMHN – Fathers' Mental Health Network \(fathersmentalhealth.com\)](#)

Healthy Babies/Healthy Children

- Free in home program with a public health nurse
- Focus on supporting new parents, maternal mental health and development of baby

[Healthy Babies Healthy Children Program – City of Toronto](#)

Pregnancy and Infant Loss Network (PAIL)

- Provides one-to-one and group based peer support to individuals touched by the loss of an infant at any stage in the pregnancy.
- 1.888.301.7276
- [Pregnancy & Infant Loss \(PAIL\) Network - Sunnybrook Hospital](#)

Assaulted Women's Help Line

- Free, anonymous, and confidential 24-hour telephone and TTY crisis line available to all women in Ontario who have experienced any form of abuse. Services include crisis counselling, safety planning, emotional support, information, and referrals.
- 1.866.863.0511 or 1.866.863.7868 (TTY)
- www.awhl.org

Distress Centre

- Free phone support for anyone in distress
- Multilingual
- [Home - Distress Centres Of Greater Toronto \(dcogt.com\)](http://dcogt.com)
- 416-4080-4357

Program and classes

- Ontario Early Years Centres
- A place for children ages zero to six years and their parents and caregivers to take part in programs and activities together.
- [Find an EarlyON child and family centre | ontario.ca](http://ontario.ca)

Parenting and Family Literacy Centres

- Free, school-based programs for parents and caregivers with children from 0 to 6 years. Fun and play-based, these programs are designed to support your child's early learning and development.
- EarlyON Child and Family Centres (tdsb.on.ca)
- Locations | TCDSB EarlyON Child and Family Centres

CHAPTER 7: GLOSSARY OF NICU TERMINOLOGY

Medical terms commonly used in the NICU

Acidosis

- A condition caused by the accumulation of waste acids in the body. These acid products may result from breathing problems (respiratory acidosis) or poor function in other systems (metabolic acidosis).

Anemia

- A condition in which the hemoglobin, which is carried by red blood cells and circulates oxygen to the tissues, is lower than normal.

Alveoli

- These are small sacs present in the lungs. They are responsible for absorbing the oxygen that we inhale from the air, and exchanging it for carbon dioxide, which we exhale.

Apgar score

- A numerical summary of a newborn's condition at birth based on five different scores, measured at one minute and five minutes.

Apnea

- This refers to the absence of breathing for 20 seconds or longer. It is also known commonly as apneic "spells."

Arterial blood gas

- This is a sample of blood that is taken from an artery via a UAC (refer to equipment for definition, page 89) to determine the body's oxygen, carbon dioxide, and acid levels present in the blood.

Bagging

- This is a layman term referring to a bag and mask system that is applied to your baby's face manually, to provide him/her with air (with or without oxygen) that is forced into the lungs to help him/her breathe. The medical term is Positive Pressure Ventilation (PPV).

B.I.D.

- A Latin abbreviation for twice per day.

Bilirubin

- This is a waste product from the breakdown of hemoglobin from worn out red blood cells. A high level of bilirubin in the blood causes a yellowing of the skin, called jaundice.

Blood gas

- This measures the amount of oxygen, carbon dioxide and acid in your baby's blood.

Blood pressure

- This is the measurement of the pressure of blood flow through the body. It is related to the force and rate of the heartbeat and the amount of blood in the body. The top number is called the systolic pressure, which measures the pressure exerted when your baby's heart contracts. The bottom number is called the diastolic pressure, which measures the pressure when the heart relaxes.

Bradycardia

- This refers to a drop in your baby's heart rate below the normal range. Normal heart rate is 100-160 beats/minute.

Capillaries

- These are very tiny blood vessels that bring oxygen and remove waste products to/from the rest of the body.

Cardiopulmonary resuscitation (CPR)

- This is a skill that can be learned through classes to provide you with knowledge of how to provide artificial breathing and a heartbeat if someone stops breathing.

Complete blood count (CBC)

- A count of the various types of cells present in the blood, chiefly: red cells (for carrying oxygen), white cells (for fighting infection), and platelets (for prevention of bleeding).

Corrected age

- This refers to the actual age that your premature baby would be if he/she were born on his/her due date. For example if he is six months old, but was two months premature, his/ her corrected age would be four months.

Culture

- A laboratory test of blood, spinal fluid, urine, or other specimens which shows if germs are present and which ones they are.

Echocardiogram

- An ultrasound picture of the heart.

Edema

- Refers to retention of fluid that causes swelling and puffiness.

Endotracheal tube (ETT)

- This is a tube that may be inserted in your baby’s airway if he/she is having difficulty breathing on his/her own. See “medical equipment” glossary page 88 for more information.

Extubation

- This refers to the removal of an endotracheal tube (ETT) from your baby’s airway.

Fontanelle

- This refers to the soft spot on your baby’s head where the skull bones have not yet fused.

Gastric aspirate

- The remainder of some of the baby’s previous feed in the belly. The nurses will check for aspirates prior to each gavage (tube) feed.

Gastroesophageal reflux (GER)

- Often referred to as “reflux” alone, this is when contents of the stomach back up into the esophagus. See Glossary of Common Medical Diagnoses.

Gavage feedings

- This is also referred to as n/g (nasogastric) tube feeds. A small tube is placed in your baby’s nose or mouth and passes into his/her tummy. It is used temporarily to provide nourishment to your baby until he/she is able to feed orally.

Heart murmur

- A noise heard between beats of the heart.

Hemoglobin

- This is a part of red blood cells that carries oxygen in the bloodstream to tissues in the body.

Hyperbilirubinemia

- This refers to high bilirubin levels in the blood.

Hypertension

- This refers to high blood pressure.

Hypocalcemia

- This refers to low levels of calcium in the blood.

Hypoglycemia

- A low amount of sugar (glucose) in the blood.

Hyponatremia

- This refers to low levels of sodium in the blood.

Hypotension

- This refers to low blood pressure.

Hypothermia

- This means a low body temperature.

Hypoxia

- This means a lack of oxygen.

Incubator/Isolette

- A bed for your baby that provides warmth and humidity. It surrounds and protects your baby from noise and other external stimuli to provide your baby with a comforting environment.

Infusion pump (IV pump)

- This pump is used to deliver exact amounts of intravenous fluid and/or medications to your baby.

Intraventricular hemorrhage

- Bleeding into the ventricles (fluid-filled spaces) within the brain. See Glossary of common medical diagnoses, page 94.

Intubation

- This refers to the insertion of the endotracheal tube (ETT) for assistance in breathing.

Large for gestational age (LGA)

- This refers to a baby who is born with a weight above the 90th percentile (i.e. larger than 90% of babies born at the same gestational age).

Low birth weight

- This refers to a baby that is born with a birth weight that is less than 2.5 kg. (5.5 lbs.) but more than 1.5 kg.

Lumbar puncture

- This is a sterile procedure in which a small needle is inserted between the vertebrae of the spine to obtain a sample of cerebrospinal fluid (CSF). The CSF is then tested for infections that may be present.

Meconium

- The first stool passed by the newborn. It is usually dark green/black and very sticky.

Neonate

- This refers to an infant in the first 30 days of life.

Neonatal Intensive Care Unit (NICU)

- A unit that specializes in caring for premature and/or sick babies. It is also referred to as a Special Care Nursery (SCN).

NPO

- An abbreviation for a Latin term that means “nothing by mouth”.

Q__H

- An abbreviation for a Latin term that means “every ___ hours”.

Prematurity

- This refers to a baby that is born before 37 weeks gestation.

Retraction

- An abnormal sucking in of the chest during breathing, indicating that the baby is working too hard to breathe.

Room air

- The air we normally breathe, which contains 21% oxygen. When supplemental oxygen is given for respiratory problems, it is in concentrations higher than 21%.

Sats

- Term for blood oxygen saturation level, which is a measurement of the percentage of hemoglobin carrying oxygen in the blood.

Surfactant

- A naturally produced soapy substance that keeps the air sacs in the lungs from collapsing and sticking together.

Small for Gestational Age (SGA)

- This refers to a baby who is born with a weight below the 10th percentile (e.g. smaller than 90% of babies born at the same gestational age).

Tachycardia

- A faster than normal heart rate.

Tachypnea

- A faster than normal breathing rate.

Total parenteral nutrition (TPN)

- This refers to nutrition (protein, carbohydrate, fat, vitamins, and minerals) that is provided to your baby intravenously.

Medical equipment commonly used in the NICU

Biliblanket

- The biliblanket has a special light that helps remove bilirubin from your baby's blood. It is similar to phototherapy lights (see definition below) except that it allows you to still hold, swaddle and feed your infant during his/her treatment. Your baby will not have to wear protective eye shields.

Blood pressure monitor

- This type of monitoring can be done either externally or internally. Externally, a small blood pressure cuff is placed on your baby's arm. Internally, blood pressure is monitored through the umbilical artery catheter (UAC – see definition below).

Cardiac/respiratory monitor

- This monitor shows your baby's heart rate and breathing rate. The nurse will manually set limits on the monitor. If your baby's vital signs fall either below or above the set limits, the monitor will alarm.

Electroencephalogram (EEG)

- This is a test used to record the electrical activity in the brain.

Electrocardiogram (ECG)

- This is a test used to record the electrical activity in the heart.

Endotracheal tube (ET tube)

- If your baby requires the help of a respirator, an ET tube must first be inserted. The procedure is performed by a doctor or respiratory therapist who is specially trained for this skill. The plastic ET tube goes through a nostril or the mouth directly into the trachea (windpipe). The other end of the tube is then connected to the respirator, which helps your baby breathe.

Isolette

- Also referred to as an incubator, the isolette provides a temperature and humidity-controlled environment for your baby. It also allows for direct observation of your baby (through the plexi-glass casing) without the need for clothing or blankets to keep warm. The isolette contains portholes on all sides so you can touch and speak to your baby.

Intravenous (IV) pump

- The IV pump delivers the right amount of fluid and/or medications required for your baby.

Nasal CPAP

- See breathing support measures in medical condition section.

Nasogastric Tube (N/G) or Feeding Tube

- This is a small tube that is placed in the nose or the mouth directly into your baby's stomach. It is a way to provide nutrition and medication to your baby until he/she is able to safely coordinate sucking, swallowing, and breathing during oral feeding and/or achieve all feeds orally.

Oxygen saturation monitor

- Oxygen saturation refers to the amount of oxygen that is carried in the blood by the red blood cells. If a baby has a lung or heart condition, the oxygen saturation may be reduced. The oxygen saturation monitor uses a red light source on a probe that is usually attached to a baby's hand or foot. Using a technique called pulse oximetry, the oxygen saturation level is monitored continuously. The oxygen saturation levels help the nurses and doctors determine whether or not your baby needs oxygen.

Phototherapy lights

- These are specific lights that are used only to treat babies with jaundice. Babies needing phototherapy will require the use of eye shields during the treatment to prevent injury to the eyes from the light.

Peripheral intravenous catheter (PIV)

- A PIV is a plastic catheter that allows fluids and medications to be delivered directly into your baby's veins. A needle first accesses the vein, and then a plastic catheter is slipped into the vein and the needle is removed. PIVs are often placed in the hands and feet and sometimes in other areas such as the scalp.

Peripherally inserted central catheter (PICC)

- This is a special IV that consists of very long thin tubing. It is inserted through a small (peripheral) vein in the arm or leg that leads to a central large vein. It is used in conditions where IV nutrition or antibiotics are needed for a long period of time. The advantage of a PICC is that it lasts much longer than a peripheral intravenous (PIV) catheter.

Temperature probe

- With a small sensor placed directly on the skin (usually on the tummy), this device monitors the baby's temperature continuously. The temperature probe is connected by a

wire to the isolette/incubator and regulates the temperature of the isolette according to the baby's body temperature.

Umbilical Artery Catheter (UAC)

- This is a small catheter that is placed in one of the two arteries in your baby's umbilical cord. It is an efficient way of taking blood samples from a sick newborn without the need for a needle to draw blood. For sick babies, the UAC may also be connected to a monitor where the baby's blood pressure can be observed continuously.

Ultrasound

- Much the same as the ultrasound done during pregnancy, the ultrasound is also used to diagnose many conditions in the newborn baby. For example, a small probe on the baby's soft spot (fontanelle) of the head is used to examine a premature baby's brain to look for bleeding and other abnormalities. It can also be used to examine other organs such as the kidneys and the liver. A special ultrasound called an echocardiogram (Echo) can examine structures of the heart.

Umbilical Vein Catheter (UVC)

- This is similar to the UAC, in which a small catheter is placed in a vein in your baby's umbilical cord (the umbilical vein). It is a way of delivering fluids and medications and can stay in place for a number of days.

Ventilator/respirator

- This machine assists your baby in breathing. See "Common Medical Conditions in the NICU" section.

Breathing support commonly used in the NICU

Nasal continuous positive airway pressure

Nasal continuous positive airway pressure (CPAP) is a machine used to provide breathing support to your baby. This machine delivers a small amount of continuous air pressure through a mask that seals around the nose or small flexible prongs placed in your baby's nostrils and into your baby's lungs. This small amount of pressure may help your baby to breathe easier by keeping the lungs expanded after each breath. Oxygen can also be delivered through this machine. Nasal CPAP therapy may be used as a first-line treatment for some babies or as a stepdown therapy when babies are weaned from the ventilator.

Low flow oxygen by nasal prongs

While their lungs are healing from various conditions, some babies may require a small amount of added oxygen to ensure that the body's vital organs are well oxygenated. Small plastic tubes are placed in your baby's nostrils (nasal prongs) to provide this extra oxygen. The oxygen level (saturation) in your baby's body is monitored continuously and the low flow oxygen is removed when it is no longer necessary.

High flow therapy

As with low flow oxygen, sometimes the oxygen that is delivered to your baby is at a higher flow rate to help your baby breathe easier. Small flexible nasal prongs are placed in the baby's nostrils and provide added oxygen that is heated and humidified for additional comfort.

Mechanical ventilator

The ventilator gently pushes air and oxygen into your baby's lungs through a breathing tube (endotracheal tube) inserted into the windpipe by a doctor or respiratory therapist. This machine is fully computerized, with the ability to detect the natural breathing motion of a baby and supports each breath by giving an adjustable amount of pressure or flow to help your baby breathe easier. The amount of support the ventilator provides will be regularly adjusted to meet your baby's needs. Your doctor, respiratory therapist and nurse are familiar with these machines and will be more than happy to explain them to you.

Glossary of common medical diagnoses

Apnea of prematurity

Apnea refers to a pause in breathing. Babies normally have short, regular pauses of breathing called periodic breathing. Apnea is significant if:

- It lasts more than 20 seconds
- It is associated with the baby changing color (pale or blue)
- It is associated with slowing of the heart rate (bradycardia)
- It is associated with a change in the baby's muscle tone

In premature babies, apnea of prematurity is commonly caused by an immature area of the brain that regulates respiration. When a premature baby gets closer to his/her due date, apnea will usually improve or go away.

Of course, apnea in a premature baby can be related to other conditions as well, such as infections, reflux, or even seizures. If your baby's doctor feels that these conditions are possible, he or she may do further tests to diagnose these conditions.

Since all premature babies are monitored continuously in the NICU, apnea and bradycardia can be picked up as it occurs, and the alarm will sound, alerting nurses and doctors to attend to the baby. Most apnea episodes resolve on their own. If not, stimulation, oxygen, or a few breaths with the bag and mask might be used. If apnea is severe and occurs frequently, some babies might have to be supported by a breathing machine.

Apnea of prematurity can also be treated with medication. Caffeine base, given orally or through an intravenous line, is commonly used for this condition. Premature babies with apnea are usually kept on caffeine until they reach about 34-36 weeks, provided that they remain free of apnea episodes. After caffeine is stopped, babies generally are monitored for a few days to be sure apnea does not recur.

Bronchopulmonary dysplasia

Bronchopulmonary dysplasia (BPD) is a condition that may have effects for many years and is most often seen in very premature babies with immature lungs who require a ventilator for a long period of time.

Prolonged ventilation causes scarring and/or damage to your baby's lungs and may also be referred to as "chronic lung disease". Prolonged oxygen treatment can also lead to chronic lung disease.



Chest X ray of baby with BPD/CLD

Hernias

A hernia is a bulge created by an organ or tissue. The bulge pushes through a weakness in the area of the body that normally contains it. The two most common types of hernias in children are umbilical hernias and inguinal hernias. An umbilical hernia occurs when a part of the intestine sticks through the abdominal wall through the navel. An inguinal hernia occurs when part of the intestine pushes through the abdominal wall in or around the groin. Inguinal hernias are more common in boys but can also occur in girls. Umbilical and inguinal hernias are more common in premature babies because of relatively higher pressure within the abdomen, pushing bowel loops through the hernia space.

An umbilical hernia usually resolves on its own within the first two years of life however, if it persists, or if the size is large and of aesthetic concern, surgical repair may be considered.

Inguinal hernias need to be repaired surgically. If the loop of bowel gets caught and is not able to move in and out of the hernia space (called an incarcerated hernia), it is a surgical emergency.

Hypoglycemia

The word hypoglycemia means low blood sugar (glucose) level. It is a relatively common problem in newborns, particularly in those born premature, those who are born smaller or larger than the normal standard, and those born to diabetic or gestational diabetic mothers. Hypoglycemia often has no symptoms in babies, so screening for hypoglycemia in those at risk (as mentioned) is usually done shortly after birth.

Screening is usually done by taking a small drop of blood from the heel. A hand-held machine analyzes the blood. An abnormal result is often confirmed by another sample of blood sent to the laboratory. An acceptable blood glucose level for a baby is 2.6 mmol/L.

The initial treatment of hypoglycemia in a term or late preterm baby is to feed the baby. In order to ensure a good supply of glucose to maintain a normal blood glucose level, you may be encouraged to breast feed your baby more often, and occasionally you may be asked for permission to use infant formula when

it is deemed necessary by your baby's doctor.

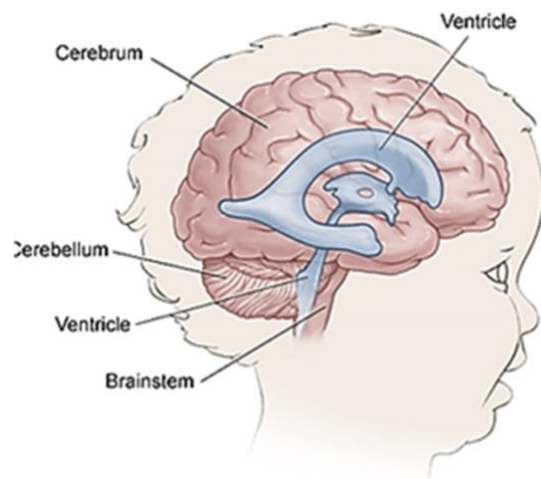
If blood glucose remained low despite one of these initial treatments, giving glucose by an intravenous line in addition to feedings may be necessary. Once blood glucose is stabilized, weaning off the intravenous may start slowly until it is no longer needed. Generally, hypoglycemia will not occur again once it is completely resolved in the newborn period. Therefore, monitoring of blood glucose at home is usually not necessary.

Research is now showing that a prolonged period of hypoglycemia, if not treated, may increase the risk of developmental problems later in childhood. Therefore, the timely treatment of hypoglycemia is very important.

Intraventricular hemorrhage

Intraventricular haemorrhage (IVH) refers to bleeding into the fluid-filled areas (ventricles) inside the brain. The condition occurs most often in babies that are born premature. The smaller and more premature the infant, the higher the risk of IVH. This is because blood vessels in the brain of premature infants are not yet fully developed. They are very fragile as a result. Rarely, IVH may occur in full-term babies.

Hemorrhage in the brain. From the Children's Hospital of Philadelphia. Reprinted with permission.



IVH is rarely present at birth. It occurs most often in the first several days of life. It rarely presents for the first time after one month of age, even if the baby was born early.

Bleeding in the brain can be classified according to how much there is and where it is. More severe bleeding, and bleeding into the brain tissue, is more concerning. If a large amount of bleeding occurs in the ventricles, blood clots can form and can block the flow of cerebrospinal fluid. This can lead to increased pressure in the brain (hydrocephalus).

All babies born < 32 weeks and/or ≤ 1500 g will be screened with routine head ultrasounds to check for IVH. There is no way to stop bleeding associated with IVH. Babies who develop hydrocephalus may need surgery to place a tube (shunt) in the brain to drain fluid.

Jaundice

Jaundice refers to the appearance of yellow color on the skin. It is caused by accumulation of bilirubin in the blood stream. Bilirubin is a waste product from the breakdown of hemoglobin in worn out red blood cells, a normal body process. In healthy adults and older children, the liver is capable of processing the bilirubin produced, so it is not accumulated in the blood stream. However, in newborns, particularly those born premature, this process is not well developed, so jaundice may occur. Occasionally, there may be other causes of jaundice, such as those related to problems of blood group or red blood cell structure and function.

Jaundice is usually first detected by observing the yellow color on the skin or on the white part (sclera) of the eyes. It is usually confirmed by checking the blood level of bilirubin. Once the baby's bilirubin level reaches the level where treatment is recommended, light therapy (phototherapy) will begin.



Before Phototherapy

After Phototherapy

Results of phototherapy. ©The Nemours Foundation/ Kids Health. Reprinted with permission.

Phototherapy uses a specific light source shining directly on the baby's skin. It is highly effective and safe. While under phototherapy, the baby will have to wear protective eye shields.



Infant under phototherapy. Courtesy of Serguei Mourachov, Flickr.

Bilirubin levels will be monitored regularly until the level is low enough for the phototherapy to be stopped. In rare instances, if the bilirubin level is dangerously high despite phototherapy, your baby might need to be transferred to a tertiary care center for special treatment, such as blood exchange transfusion.

Meconium aspiration syndrome

Shortly before the time of birth, some babies, for various reasons, may experience stress. A common response to stress at that time is to pass a certain amount of stool, a sticky tarlike substance called meconium, into the amniotic fluid. This may lead to babies inhaling (aspirating) meconium at birth. Although suctioning of the baby's mouth, nose, and possibly airway is usually done after birth in this situation, Meconium aspiration syndrome (MAS) may still occur, with babies presenting with breathing difficulty because meconium is aspirated into the lungs.

MAS can be diagnosed by a chest x-ray. Some babies with MAS can be quite ill, requiring intensive support for their lungs and heart. MAS can lead to other complications as well, including pneumothorax (collapsed lung), and a condition affecting the ability of the lungs to receive oxygen called persistent pulmonary hypertension of the newborn (PPHN), which require very specific treatments.

Necrotizing enterocolitis

Necrotizing enterocolitis (NEC) occurs in a small percentage of infants in the NICU and happens more commonly in low birth weight and premature infants. The cause of this condition is not entirely clear but it involves injury to parts of the intestine. It is thought that the combination of several factors can contribute to the development of NEC.

Although a full-term infant can get the condition, NEC occurs far more commonly in the premature infant. The more premature a baby is, the greater the risk of developing NEC. Other

factors that are also believed to contribute to the development of NEC include the introduction of milk feeding, injury to the intestines from an infection, and poor blood flow to the intestinal tract.

Babies with NEC may:

- Have a tender or distended abdomen
- Need increased oxygen or breathing support from the ventilator
- Have blood in their bowel movements
- Have apnea, or increasing number of apneas
- Have poor feeding/absorption of feeds
- Vomit/regurgitate
- Have increased jaundice

An X-ray of the abdomen confirms the diagnosis The doctors treat NEC by:

- Giving antibiotics
- Stopping all intestinal feeding (such as formula feeding, breastfeeding, or tube feeding with breast milk)
- Switching to an IV for fluids and nutrition
- Draining the baby's stomach
- Providing pain relief
- Monitoring with x-rays in the first few days. This is important as it looks for improvement or for deterioration
- In some babies, NEC may injure the intestine so severely that it causes perforation. Intestinal perforation from NEC is a medical emergency, requiring surgical treatment

Recovering from the condition can take a long time. Babies may spend a few weeks in the NICU re-adjusting to regular feeding after NEC.

Osteopenia of prematurity

Osteopenia is a decrease in the amount of calcium and phosphorus in the bone. This can cause bones to be weak and brittle and increases the risk for broken bones. Premature and low birth weight babies will have extra calcium and phosphorus added to their milk (fortifier) to ensure healthy bone growth. Special preterm formulas are used when breast milk is not available.

Blood tests to check levels of calcium, phosphorus, and a substance called alkaline phosphatase are used to monitor for osteopenia of prematurity.

Patent Ductus Arteriosus

The ductus arteriosus is a blood vessel in the heart that connects the aorta (which provides blood to the rest of the body) to the pulmonary artery (which sends blood to the lung). It allows blood to bypass the lungs while a baby is still in the womb.

The ductus arteriosus usually closes shortly after birth, which allows for normal blood circulation. But in some babies, most often premature ones, it remains open, or patent. This condition is known as a Patent Ductus Arteriosus (PDA). With a PDA, excessive amount of blood then flows through the ductus arteriosus into the blood vessels of the lungs, causing various degrees of breathing and heart circulation problems.

Breathing problems may be a sign that a baby has a PDA. A heart murmur may also lead doctors to suspect the condition, which is then confirmed with an ultrasound of the heart called an echocardiogram. The echocardiogram is also helpful in determining the size of the PDA and therefore its effect on the function of the heart and lungs.

If the PDA is small or is on its way to closing, doctors may continue to monitor and no intervention is needed. For moderate or large PDAs, medicine may be used to close the ductus arteriosus, but if that doesn't work, or if the baby is too sick to take the medicine, the infant may need surgery to close the PDA.

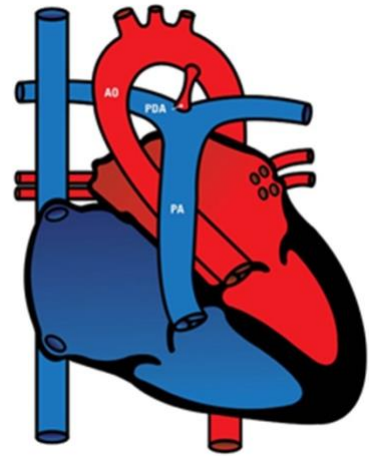
Pneumonia

Although uncommon, some babies may be born with infections within the lungs (pneumonia). Such infections may be acquired through the birth canal or from the womb (placenta and uterus).

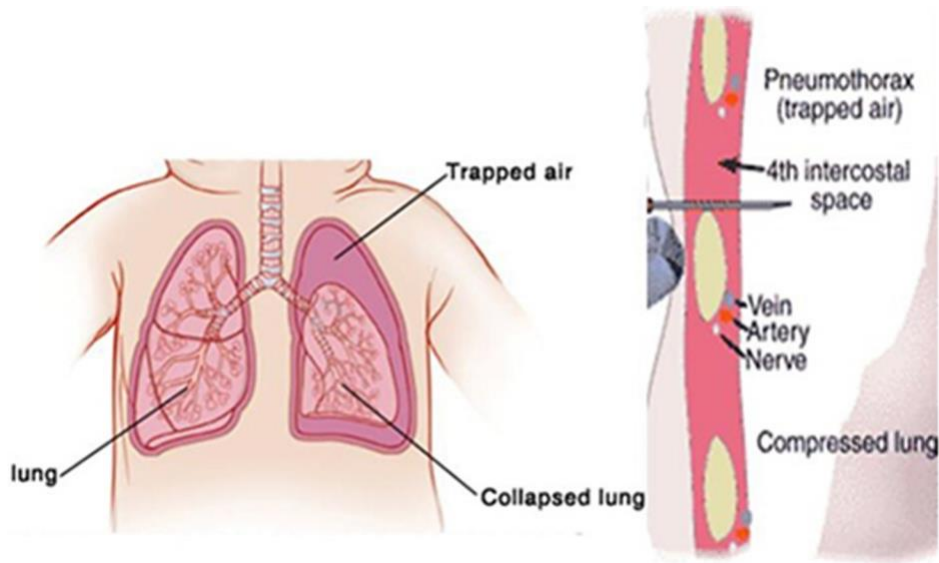
Babies with pneumonia could present with breathing difficulty shortly after birth. Pneumonia is usually diagnosed by a chest x-ray. Treatment may include breathing support (using a respirator or CPAP machine) and oxygen. Specific treatment for pneumonia is antibiotics by an intravenous for about seven to ten days.

Pneumothorax

Within the chest cavity, there are two linings (pleura) sticking together and wrapping the lungs tightly. In some babies, during the process of birth or while receiving support for breathing difficulty, air could leak in between the two pleura, breaking the seal and creating a pocket of trapped air (pneumothorax). This pocket of air can push on the lung next to it, leading to collapse of the lung. Babies affected by this condition will present with sudden onset of breathing difficulty.



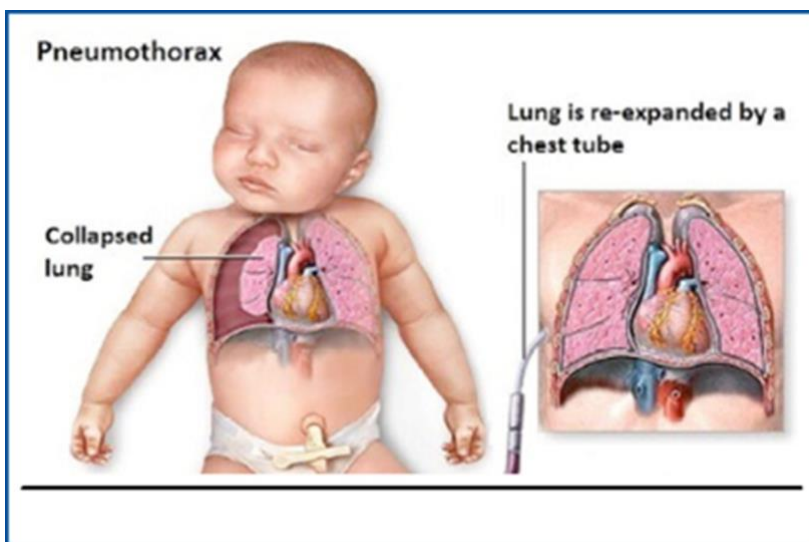
AO, aorta; PA, pulmonary artery;
PDA, patent ductus arteriosus.
Illustration courtesy of Abbott
Nutrition. Adapted with permission.



Pneumothorax drainage. Courtesy of EasyPediatrics.org.

Pneumothorax can be diagnosed by a chest x-ray. Occasionally, the pocket of air can be seen by shining a strong light on the baby's chest – a procedure called transillumination. Treatment of pneumothorax can include breathing support (by a respirator) and oxygen.

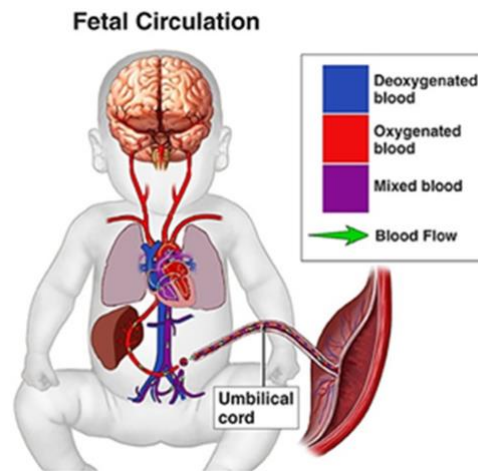
Specific treatment for a large pneumothorax is to get rid of the trapped air pocket by inserting either a needle (needle aspiration) and or by a plastic tube linking to a suction device (chest drain).



Courtesy of American Baby & Child Law Centers.

Persistent pulmonary hypertension of the newborn

Persistent pulmonary hypertension of the newborn (PPHN) is defined as failure of the normal circulatory transition that occurs after birth. The blood vessels in the lungs remain constricted and are unable to open and relax, as they should. This leads to low levels of oxygen in the blood. PPHN is seen in association with many neonatal respiratory diseases including lung underdevelopment, MAS, pneumonia, and surfactant deficiency. It may also be seen in the absence of triggering diseases. The primary goal of therapy is to selectively reduce the pressure in the lung vessels and thereby improve oxygenation.

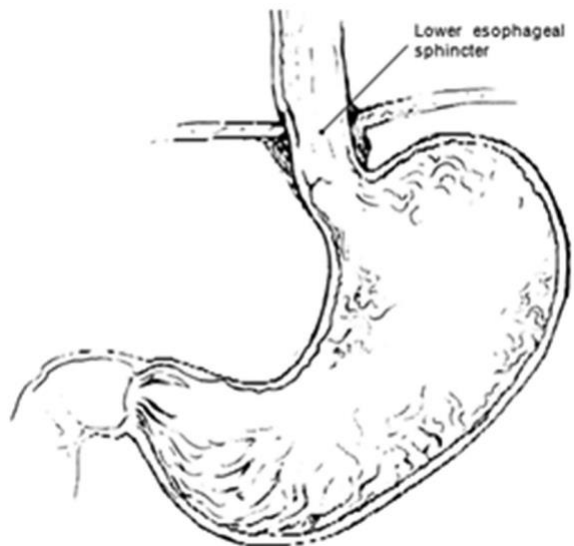


Fetal circulation. ©Doctorstock.com.

Gastroesophageal reflux

Reflux refers to the condition where food from the stomach moves up the esophagus (swallowing tube). Reflux is common in babies under one year old, and even more common in premature babies. Normally, stomach content is prevented from moving up the esophagus by muscles tightening up at the lower end of the esophagus. In babies, these muscles may not be well developed and functional, allowing reflux to occur.

Healthy anatomy of stomach and lower esophageal sphincter



Mild reflux in babies is commonly known as “spitting up”. However, reflux can also cause other symptoms such as:

- Apnea (pause in breathing)
- Fussiness, arching of the back, and crying during or after feeds
- Coughing after feeds
- Poor growth
- Chest infection from food and stomach acid refluxing from the stomach and entering the lungs

These symptoms commonly occur shortly after a feed; however, they can also happen during a feed, or long after a feed is finished. At present, there is no one test to definitively diagnose reflux in babies. It is most often a clinical diagnosis (i.e., based on observation of symptoms).

Treatment of reflux:

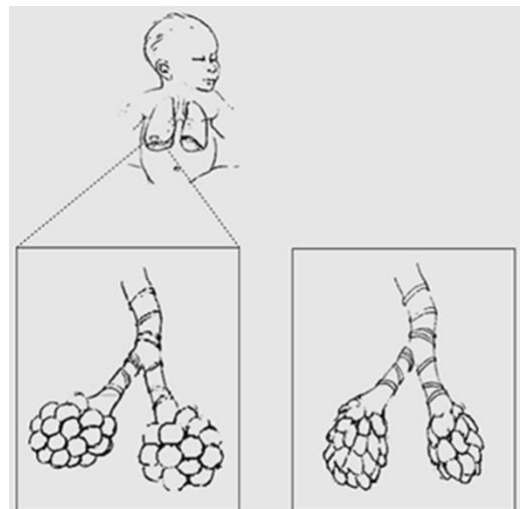
When a baby is experiencing reflux, it is beneficial to hold the baby upright for a period after feeds. If lying the baby down, it is helpful to elevate the head of the bed. In babies receiving tube feeding, sometimes using a pump instead of gravity to run the feeding into the stomach slowly may decrease the chance of reflux. In more severe cases of reflux, medication to reduce the acidity of stomach contents or to speed up the digestive process may be used.

Most babies outgrow reflux as they get older and as the muscles at the lower end of the esophagus become tighter.

Respiratory distress syndrome

Respiratory distress syndrome (RDS) is commonly referred to as premature lung disease, because premature babies, especially those less than 30 weeks gestation at birth, are particularly prone to this condition. It is caused by the lack of surfactant in the linings of the lung’s air sacs.

Surfactant is a naturally produced soapy substance that keeps the air sacs from collapsing and sticking together. As you can imagine, a baby with lungs having little or no surfactant will have great difficulty breathing. Surfactant production in the lungs depends on maturity of the infant; the more premature a baby is, the more likely surfactant deficiency will occur at birth.



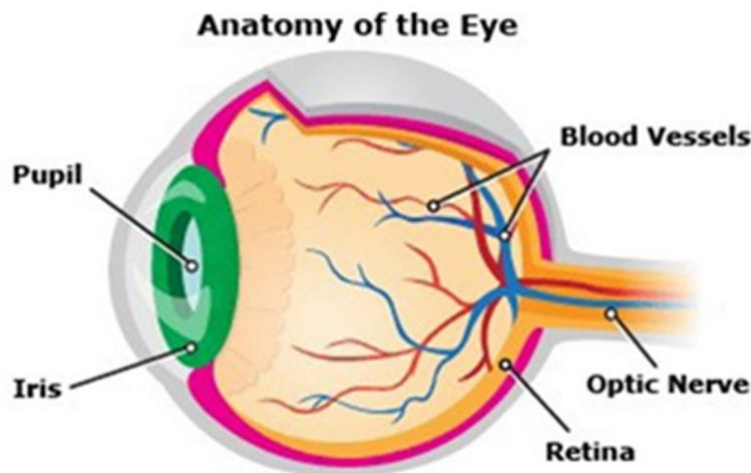
Healthy alveoli vs. those without surfactant.

RDS is generally diagnosed by a chest x-ray. The treatment for RDS is breathing support using a respirator and oxygen. These treatments will decrease the work required to breathe and will ensure oxygen is delivered to the body where it is needed. The next step in treatment is to give surfactant through a breathing tube (endotracheal tube) into the lungs.

Surfactant is extremely safe and effective. Within one and sometimes two doses, babies with RDS will generally have a good response, with decreasing breathing support and oxygen need within hours.

Retinopathy of prematurity

Retinopathy of prematurity (ROP) is commonly seen in premature infants. ROP refers to an abnormal growth of the tiny blood vessels of the eye, which can cause retinal disease if not properly followed by an Ophthalmologist. We screen all babies < 31 weeks gestational age and/or $\leq 1,250\text{g}$ for ROP.



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Transient tachypnea of the newborn

Transient tachypnea of the newborn (TTN) is commonly known as “wet lungs”. Before birth, the lungs are naturally filled with fluid. During childbirth, the onset of labour signals the fetus’ lungs to rapidly absorb its fluid, so that air breathing can occur at birth. Therefore, in situations where labour is short or absent, lung fluid absorption might be delayed, leading to “wet lungs” or TTN. A good example of such a situation is Caesarean section birth without labour, where the likelihood of TTN is higher than normal in the newborn.

TTN can range from mild to severe, depending on the amount of fluid that is retained in the lungs. Babies with TTN present with breathing difficulty shortly after birth. In mild cases, TTN can be managed in the delivery room by giving a short period of breathing support using air pressure by a device called continuous positive airway pressure (CPAP) and oxygen if needed. In

more severe cases, babies may have to be admitted to the NICU and be supported by CPAP or a respirator.



Baby on nasal CPAP. Courtesy of Hospital International.

Glossary of NICU medications

Antimicrobials

Ampicillin	An antibiotic given through an IV that is used to treat infections caused by certain bacteria.
Acyclovir	An antiviral used to prevent or treat infections caused by certain viruses.
Cefotaxime	An antibiotic given through an IV that is used to treat infections caused by certain bacteria.
Gentamicin/tobramycin	An antibiotic given through an IV that is used to treat infections caused by certain bacteria.
Metronidazole	An antibiotic given through an IV that is used to treat infections caused by certain bacteria.
Nystatin suspension	An antifungal used to prevent or treat yeast infections in the mouth, such as thrush.
Trimethoprim	An oral antibiotic that can be used to prevent urinary tract infections.
Vancomycin	An antibiotic given through an IV that is used to treat infections caused by certain bacteria.

Respiratory medications

Caffeine	A medication used to stimulate breathing and to treat apnea of prematurity. May be given either through an IV or orally.
Budesonide (Pulmicort®) Nebules	An inhaled steroid medication that is sometimes used for bronchopulmonary dysplasia. It may reduce lung inflammation and improve lung function.

Vitamins/supplements

<p>Ferrous fumarate (Iron) (Palafer®)</p>	<p>To prevent or treat iron deficiency and replace body's stores of iron. Iron is a mineral that the body needs to produce red blood cells and is also important for brain development.</p>
<p>Vitamin A, D, C (Tri-Vi-Sol® or PediaVit NP®)</p>	<p>A multivitamin supplement,</p> <ul style="list-style-type: none"> • Vitamin A helps keep eyes, skin, and immune system healthy. • Vitamin D works with calcium to help maintain healthy bones and teeth. • Vitamin C helps keep the immune system healthy, plays an important role in the growth and repair of bones and teeth, and helps body absorb non-heme iron from grains and vegetables
<p>Vitamin D (Baby D Drops®, Di-Vi-Sol®)</p>	<p>A supplement that works with calcium to help maintain healthy bones and teeth and to protect against cell damage</p>
<p>Vitamin E</p>	<p>Vitamin E supplements are sometimes recommended for babies that have trouble absorbing fat-soluble vitamins. Vitamin E helps keep the immune system healthy and to protect against cell damage.</p>
<p>Sodium chloride 23.4% Oral Solution</p>	<p>A salt supplement used to increase sodium levels in the blood.</p>
<p>Sodium phosphate oral solution (Phoslax ®)</p>	<p>A phosphate supplement used to increase phosphate levels in the blood (phosphate is needed for healthy bone growth).</p>
<p>Calcium oral suspension</p>	<p>Calcium supplements may be used to increase calcium levels in the blood and to support healthy bone growth.</p>

Reflux medications

Domperidone suspension	Is used to prevent or treat reflux (heartburn) by increasing movement of food through stomach and intestines.
Famotidine solution	Is used to prevent and treat reflux (heartburn) by decreasing the amount of acid produced in the stomach.
Omeprazole suspension Or Lansoprazole suspension	Is used to treat and minimize discomfort of reflux (heartburn) by decreasing the amount of acid produced in the stomach.

Topical medications

Erythromycin eye ointment	An antibiotic eye ointment given shortly after birth to prevent eye infections.
Cholestyramine ointment	A protective ointment for diaper rash that is difficult to treat. Cholestyramine ointment works best on rashes caused by frequent loose stools.
Clotrimazole cream	An antifungal cream used to treat yeast infections in the diaper area. May be used in combination with a steroid cream.
Hydrocortisone cream	A steroid cream used to relieve redness and irritation in the diaper area. May be used in combination with an anti-fungal cream.
Zinc Oxide 15% cream (Zincofax [®])	Used to help protect skin in the diaper area and to prevent rash and irritation.
Zinc Oxide 40% paste (Desitin [®])	Used to help treat diaper rash.

Other medications

Glycerin tip	To help relieve constipation and promote bowel motility to reduce straining.
Indomethacin or Ibuprofen	A medication that helps to close a persistent Patent Ductus Arteriosus (PDA).
Palivizumab (Synagis®)	An injection that helps prevent serious lower respiratory tract disease caused by Respiratory Syncytial Virus (RSV) by helping your baby's immune system fight against RSV. It is given monthly from November to March to babies at moderate-to-high risk for RSV.
Simethicone	Used to ease too much gas in the gastrointestinal tract.
Sucrose 24%	A sugar water mixture used to help reduce pain.
Vitamin K injection	An injection given shortly after birth to ensure proper clotting of the blood and to prevent bleeding.

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