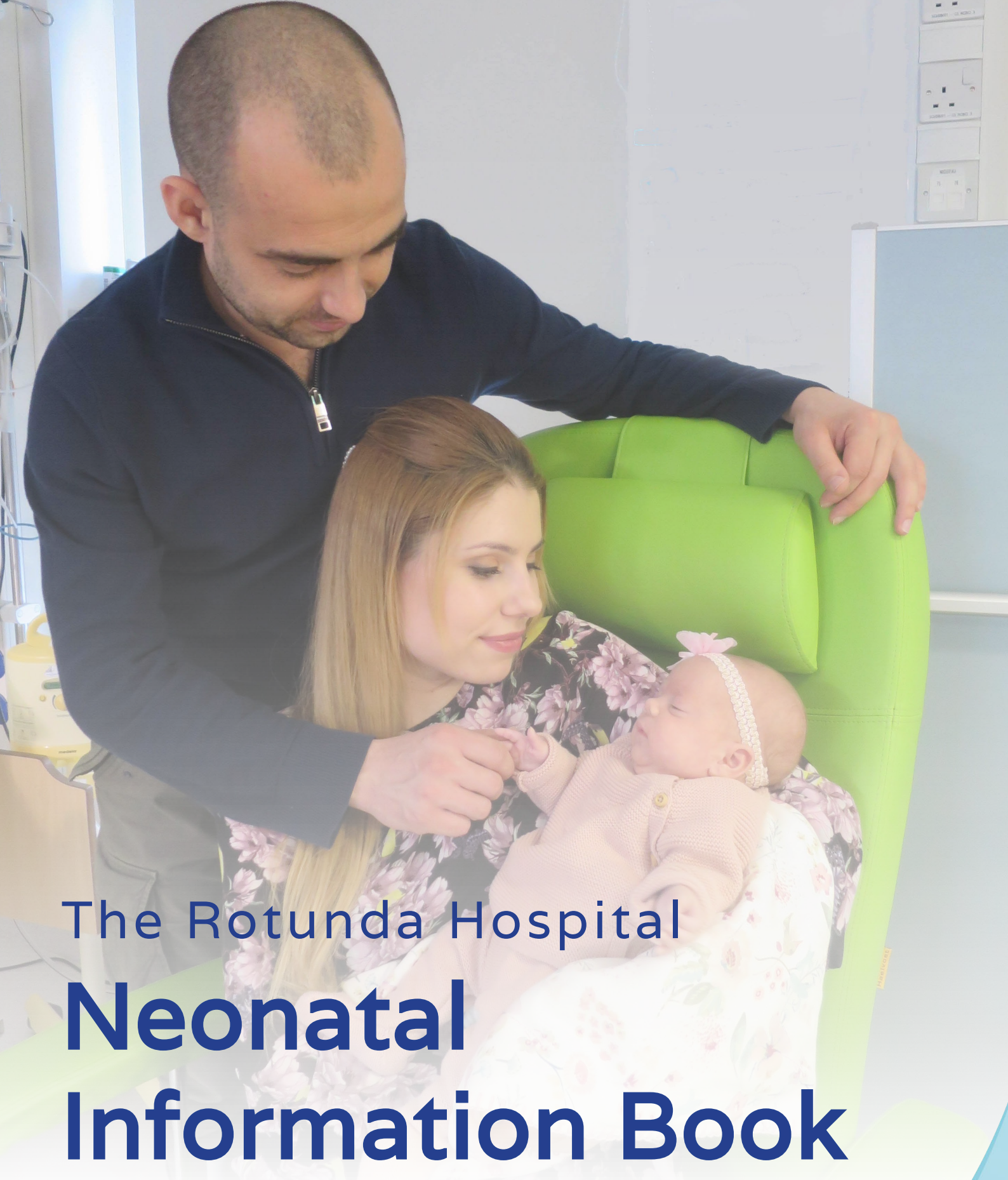


The Rotunda Hospital

Neonatal Information Book

THE ROTUNDA HOSPITAL DUBLIN

Contents

Baby Record

My Name is _____

I was born on _____ At _____

I Weighed _____

My Head Circumference is _____

I had my first cuddle with Mum on _____

I had my first cuddle with Dad on _____

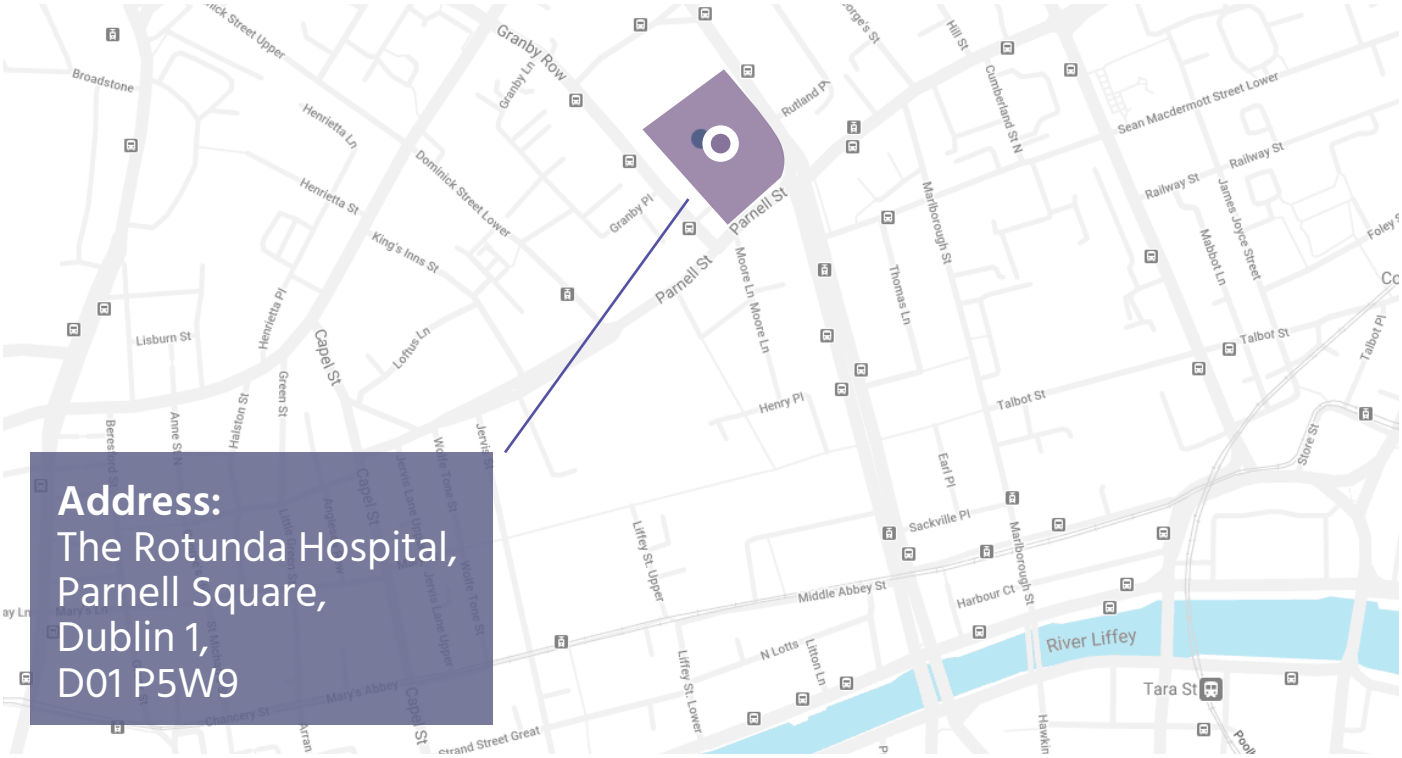
I cried for the first time on _____

My first feed was on _____

I went into a cot on _____

I went home on _____

Where to find us?



Address:
The Rotunda Hospital,
Parnell Square,
Dublin 1,
D01 P5W9

Introduction
to the Neonatal Unit

Congratulations, you have just become the proud parents of one or more beautiful babies. We know that this may be a difficult time for you, as you have to entrust your babies to our care. Our philosophy is to give high quality, specialised care to every baby and family. The aim of this book is to let you know what to expect and to try to reduce some of the anxiety that you are bound to feel when your baby is unwell.

This book is intended as a reference guide and should not replace your regular talks with nursing and medical staff.

The Neonatal Unit in the Rotunda has been providing care for all sick or premature infants born in the hospital, and those transferred from other hospitals, since the 1950s. The Rotunda Hospital is located on Parnell Square, just off O'Connell Street, Dublin 1. The Neonatal Unit is situated on the second floor of the hospital and consists of intensive care, high dependency and special care sections.

Most babies are in good health at birth but around 10% will require admission to the Neonatal Unit. Small premature babies (born before 34 weeks gestation) and sick bigger babies will be admitted for observation, treatment and ongoing care. Premature babies, because they are born early, may take some time before they are well enough to go home. Bigger babies are transferred back to their mothers on the postnatal ward once their condition improves. Babies transferred from other hospitals to the Rotunda's Neonatal Unit will be transferred back to their referring hospital for ongoing care, once their condition is stable enough to permit this transfer.

Not everything described in this book will apply to your baby.

'He/she' is used interchangeably throughout this book for the sake of simplicity.

Essential Information for Parents

Visiting

You, as parents, are welcome and encouraged to visit. We will let you know what the visiting arrangements are, as they are subject to change. We may ask you to leave for a short time when it is necessary to protect the privacy and confidentiality of babies being discussed nearby.
Examples are:

- Nursing handover which happens at 7:30am and 8:00pm each day. Please allow 45 minutes for shift changes. Allow yourself time for a visit rather than coming to the unit as handover is about to start.
- Medical ward round which occurs at 9:15am Monday to Friday, 12 noon Saturday and 11:00am Sunday. Please allow an hour for the ward round.
- When an emergency arises or certain procedures are being carried out for your baby or a baby close by.
- Sometimes during the admission of an ill baby.

During your visit we would ask you to stay by your baby's side and respect the privacy of the other babies by not straying over to their incubator or cot. Please do not ask the staff questions about other babies.
Unfortunately we do not allow children or other relatives to visit except in exceptional circumstances. This is due to the risk of illness carried by young children and the numerous infection outbreaks in the community which can be very dangerous for premature and newborn infants. This policy has been developed for the protection of your baby and all the other babies in the unit. Your co-operation and understanding are appreciated.

Infection Prevention and Control

What can I do to protect my baby?

Protect your baby by ensuring that you are well before coming to visit. Even minor illnesses like colds and coughs can be much more serious for small babies. If you are ill, phone the unit and a staff member will give you guidance on whether it is in the best interest of your baby to visit.

If you have been in contact with someone who has a contagious illness, for example, chickenpox, measles, "flu", Covid-19 or a vomiting bug, please phone the unit to let us know before visiting.

If you have vomiting /diarrhoea, please do not visit until at least 48 hrs have passed since you last vomited or had a loose bowel motion.

Cold sores are caused by a virus called Herpes Simplex Virus. This virus can cause more serious infections in newborn babies. If you have a cold sore, please start treatment for the cold sore (over the counter medication) before you visit. Please keep it covered when in contact with your baby.

Hand Hygiene

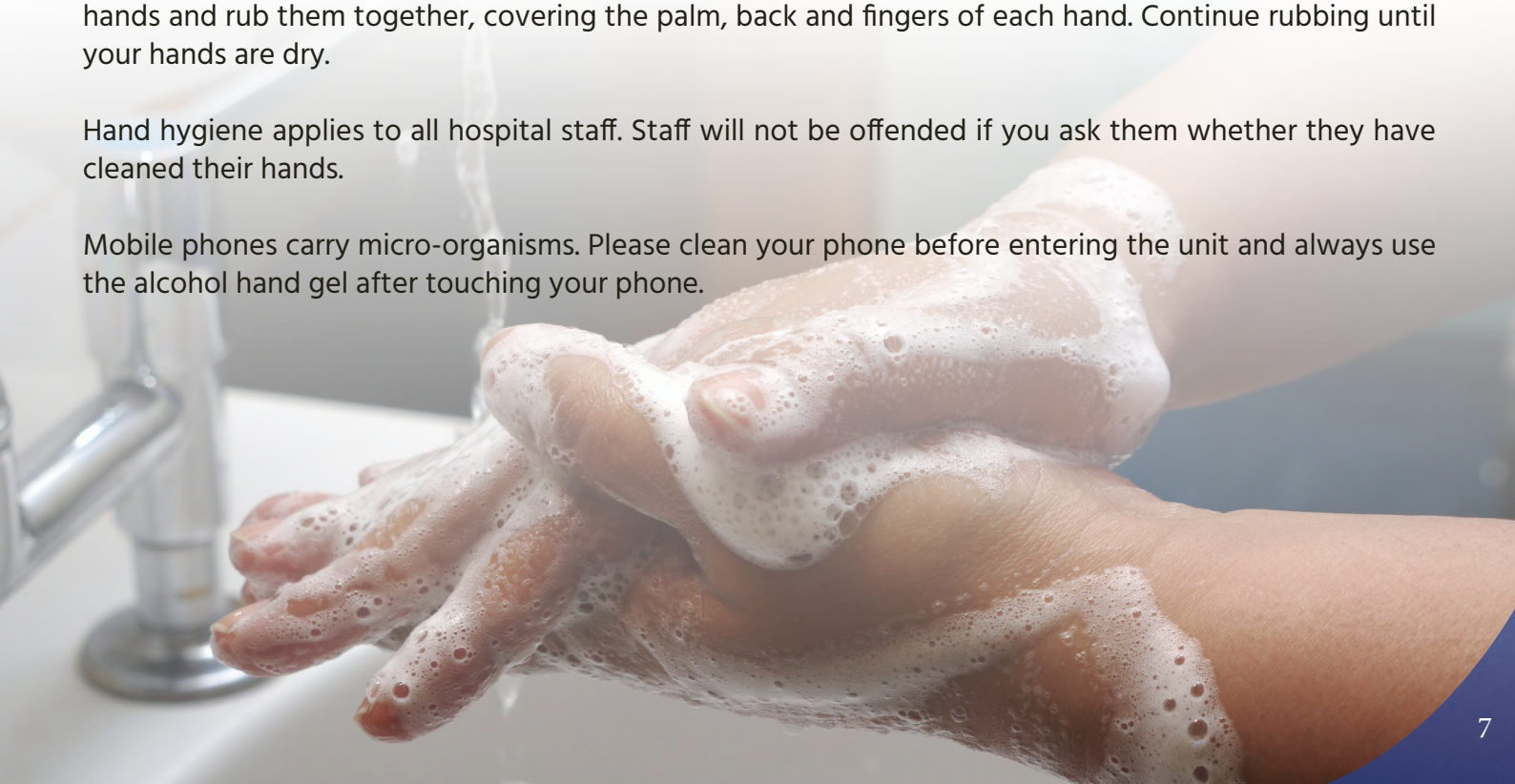
Germs that naturally live on a person's skin and normally cause few problems may be more serious when brought into the unit. Therefore, everyone who enters the Neonatal Unit is asked to wash their hands. This applies even if you are not planning on touching your baby. Hand hygiene is recognised internationally as the single most important preventative measure to stop the spread of these germs.

To perform hand hygiene correctly, everyone needs to be 'bare below the elbow'. This means that you should remove your coat, watch and rings except a wedding ring. (Please keep your jewellery safe.) Roll up your sleeves and wash your hands for at least 20 seconds using soap and water. Wash the palm, back, fingers and wrist of each hand. Remember to turn off the taps with your elbows. There are posters beside the sinks to fully explain the hand washing technique. Germs love moist skin so it is important to make sure you dry your hands well. Put the paper towel in the bin using the pedal and without touching the lid. Please leave your jewellery off until you are leaving the unit.

Alcohol gel is placed throughout the unit and by each baby's cot space. You, and the staff caring for your baby, can apply it immediately before and after touching your baby. Apply the gel to the palm of your hands and rub them together, covering the palm, back and fingers of each hand. Continue rubbing until your hands are dry.

Hand hygiene applies to all hospital staff. Staff will not be offended if you ask them whether they have cleaned their hands.

Mobile phones carry micro-organisms. Please clean your phone before entering the unit and always use the alcohol hand gel after touching your phone.



Vaccines

We strongly recommend that all parents receive the Flu (Influenza) vaccine during flu season (September to April). This helps to protect you, your baby and all the other babies in our Neonatal Unit. Whooping cough (Pertussis) is another serious illness for babies. It is advised that parents and close contacts of babies born before 32 weeks gestation, should get the Pertussis vaccine if they have not had it in the previous 10 years. The COVID-19 vaccine will protect you, your baby and your family. The nursing and medical staff are happy to discuss any questions you have about vaccinations.

Screening for multi drug resistant organisms (MDRO)

The Neonatal Unit has a continuous programme of audit and monitoring to ensure that we are achieving the highest standards in infection prevention and control.

One of our important monitoring programmes is our weekly screening test for multi drug resistant organisms. MDRO bacteria (bugs, sometimes called superbugs) are resistant to many antibiotics. This means that they are harder to kill than most common bugs. You might have heard of some of the more common superbugs like MRSA, CPE, ESBL and VRE. In our Neonatal Unit, we carry out a weekly check on all babies to identify if any baby is carrying any of the antibiotic-resistant bacterias. This is a simple procedure where cotton swabs are rubbed gently on your baby's skin, nose and bottom. The samples are then sent to the microbiology laboratory for testing. It is important that we identify these bugs so that we can choose the best antibiotic treatment for your baby if he develops an infection while in hospital.

A positive swab usually means that these micro-organisms have caused 'colonisation'. This means that your baby may have these micro-organisms on his skin or in his gut, without becoming unwell or needing antibiotics. If he is found to be carrying an MDRO, you will receive specific information about this and what it means for him. In order to protect him and prevent spread to other babies, staff may decide to isolate him and take extra precautions, such as wearing gloves, aprons or gowns. If you have any questions or concerns, a member of our infection prevention and control team are always happy to meet with you.

Neonatal Team

We have a varied team of multidisciplinary professionals available to support you and your baby throughout your neonatal journey. The nurse looking after your baby can link you in with the necessary team members. We are all here to help your baby, guide you through caring for him and to answer your questions.

The Neonatal Unit is staffed around the clock with specially qualified Neonatal Nurses. A Neonatal Registrar and/or Advanced Nurse Practitioner (Neonatology) and a Senior House Officer are on duty at all times. A Consultant Neonatologist is always contactable. All other essential services, such as x-rays and blood tests, are available 24 hours a day.

The Nursing Staff

Clinical Midwife Manager 3 (CMM 3) is a senior manager with overall responsibility for managing the Neonatal Unit and leading the nursing team.

Clinical Nurse Managers 2 and 1 (CNM 2 and 1) are responsible for the day to day running of the unit and are available twenty four hours a day.

Staff Midwives (SM) and Staff Nurses (SN) are midwives and nurses with specialised knowledge who provide direct care to your baby.

Student Midwives and Student Nurses are midwives and nurses undertaking their education and training.

Advanced Nurse Practitioners [ANP] (Neonatology) are nurses who have advanced education in the care of newborn babies and their families.

Discharge Planning Co-coordinator is a nurse whose primary goal is to help you prepare and be confident in taking your baby home.

Clinical Skills Facilitator (CSF) is a nurse who coordinates the continued education of all the nurses within the unit.

Lactation Consultant is a midwife with extra qualifications in all areas of breast feeding and breast milk expressing.

Mental Health Support Midwife is a designated midwife available in the hospital to talk to you for ongoing support.

Maternity Care Assistants (MCA) assist the nursing staff in providing care to babies and their families.

The Medical Staff

Consultant Neonatologists are highly qualified doctors who specialise in the care of newborn babies.

Non Consultant Hospital Doctors (NCHD) are Registrars and Senior House Officers who provide twenty four hour cover within the hospital.

Developmental Psychologist helps the whole family adjust to the birth of a premature or ill baby.

Radiologists perform scans and interpret x-rays.

Support Staff

Ward Clerk is responsible for the clerical administration in the unit.

Household Staff ensure the daily hygiene services are maintained within the unit.

Porters are available for all portering duties.

Allied Health Professionals

Medical Social Workers are available to provide emotional support and practical assistance.

Neonatal Pharmacists liaise with medical and nursing staff regarding medication.

Dieticians manage and monitor the baby's nourishment and growth.

Physiotherapists help and provide advice on ways to promote normal movement and muscle development.

Radiographers take x-rays.

Clinical Engineers maintain the equipment.

Extra Services

Chaplains/ Ministers of Religion

We have a lay Roman Catholic chaplain on site Monday to Friday who is available to people of all faiths and of no specific faith. Chaplains or ministers from a range of different faiths are available to parents, please just ask.

Interpreters

An interpreter can be contacted to help you communicate with the neonatal team if you cannot speak or understand English well.

Your Baby and You

The initial shock of seeing a small and/or ill baby for the first time can be very frightening for parents. Your first thoughts may be that your baby is so small and/or ill that you may cause pain or distress by touching him. This is a common reaction, and staff are always available to guide and help you.
In the very first days of life your baby may have difficulty adapting to all the sounds, lights and sensations that he is being exposed to for the first time. Rest is very important for him so handling is minimised. Leaving the protection of the incubator may require too much energy from him, so you may not be able to hold him straight away. We may also ask you not to stimulate him too much at this stage. Nevertheless he will know your voice so do spend some time talking softly to him. You may also be able to have contact with him by giving him your finger to hold or by gently placing your hands on his body called 'comfort holding'.

Many babies do not like being stroked or touched lightly. Comfort holding is a form of positive touch that will help him feel secure and relaxed. It involves cupping your warm still hand around his head and/or feet. Gently place the other hand around his shoulders or hold his arms across his chest. Breathe slowly and deeply and keep your hands relaxed. To finish, slowly remove one hand and only remove the second hand if he continues to remain relaxed.

Many premature or ill babies have a hard time handling several things at once. Use only one form of interaction at a time such as touching or speaking.

As he becomes stronger, he will come out for cuddles and skin to skin contact. You can also help with his cares (nappy changes, feeds etc) and other tasks important to his comfort. You will get to know him, discover his unique personality and identify and recognise his needs. Learn how he communicates by watching his facial expressions, breathing, skin tone, and his hand and foot movements. With time, you will become very comfortable with handling and caring for him and even if you feel a little nervous, remember you are not alone.

You are welcome to take photos and videos of your baby. Please don't photograph or video the other babies or staff in the unit.

You may bring in Religious items if you wish. Please give them to the nurse who will put them in a sealed plastic bag before placing them in the incubator or cot.

Expressing breast milk is something that mums can do that will directly benefit their baby and this will be discussed in more detail later.

Kangaroo Care/Skin-to-Skin Care

Kangaroo care is skin-to-skin contact where your baby is placed next to your skin on your chest. This has many physical and emotional benefits for you both. It helps to calm your baby, regulate his heart rate and breathing and encourages deeper sleep which all improves his weight gain. It helps in establishing an everlasting bond between parent and baby through touch and smell. You feel closer to him and become more confident about caring for him. Another benefit is in establishing milk supply and breastfeeding later on.

Generally baby is naked except for his nappy. He is placed on your chest, next to your skin, inside your clothes. When he is lying against your chest, support his head with one hand and place the other hand around his body. He may need a hat and a blanket to keep him warm. Now relax and enjoy this special time together. If he remains stable it is advisable to continue kangaroo care for a minimum of 90 minutes to facilitate deep sleep cycles. Understandably you may be very apprehensive at first but before long these feelings will pass as you become more confident holding him.

Kangaroo care is still possible even when he needs extra help with his breathing. The nurses will advise you when he is strong enough and will help you manage any wires and tubes while you hold him.

Kangaroo care is generally not initiated just after a feed as babies tend to be uncomfortable being moved on a full tummy. However, if we start kangaroo care before his feed, it is possible to feed him during kangaroo care.

Separation at the end of kangaroo care may be difficult for both of you. You can help him fall back asleep in the incubator by staying next to him, comfort holding, talking quietly to him or by leaving a cloth with your smell on it in the incubator.

It is important to be aware of personal hygiene, wearing clean clothes and carefully cleaning your hands. Wear comfortable loose-fitting clothes and a top that opens down the front. Tie back long hair. Have a drink nearby.

Doing kangaroo care must be a free choice. If you do not feel ready, or you do not want to do it, there is no reason to force yourself to do so. Just let the nurse know and we will respect your choice. There are many other ways to be close to your baby.

Feelings and Reactions

Most people expect their pregnancy to go to full term, to deliver a healthy infant and to be discharged home with their baby a few days later. Instead you are here with us in the Neonatal Unit. You may have very mixed feelings about your baby being premature or sick, including feelings of guilt, anxiety, disappointment and fear. You may wonder what you did wrong to cause this to happen. You need to keep in mind that his illness is unlikely to be related to anything that you have done and the staff in the unit can discuss and reassure you about this. Don't be afraid to ask questions, voice your fears or seek our help, that's what we are here for.

It is common to feel that you have nothing to contribute and that the doctors and nurses are completely in charge. We want you to know that we are not here to take your place. We are here to guide you through this experience, by helping you make informed decisions and providing you with the information, advice and resources you need to take your baby home with you. Your role as a parent is a vital part of your baby's care.

If you feel alone or afraid, remember we are here to listen and be a shoulder to cry on. We will also be here to celebrate your baby's many milestones, achievements and rejoice in the victories with you.

But most of all, we will support you, and help you through this long, uncertain and sometimes scary journey. You will grow and learn with your baby and some days will be easier than others. The hard days can be really hard, but there will be many more days that will leave you so proud of your little fighter.

As time passes and his condition improves, you become more relaxed and positive and feel ready to take part in his care. Talking to and touching him, and kangaroo care when he is able, will help you to get to know him and develop a bond between you all.

Mum, you may have to go home from hospital without your baby. It may be a very emotional experience to leave without him. It is normal to feel upset, so be gentle on yourself on the day you go home. Have a supportive person with you.

Dads and partners, there can be huge pressure on you to keep everything going. It can be stressful supporting mum and other family members, continuing to work maybe, while also finding the time to visit your new baby.

The neonatal journey is a similar experience for everyone but also a unique journey for each person. Families are all different. Some parents are drawn closer together but even the most loving relationship can come under strain. A lot of parents can feel isolated from each other. It can be difficult to go on caring and thinking about each other while both of you are caught up in your own thoughts and feelings. Each person may have different ways of handling and expressing these feelings. Talking to each other comes easily for some couples but for others it is much harder, yet usually it is the talking that makes things bearable. The emotional support of our mental health nurse, psychologist and social worker may also be beneficial.

Talking with other parents can often be a great source of support and encouragement. Everyone can be at different stages of their neonatal journey. It can be great to talk to parents who have already been through what you are going through (bearing in mind that each baby's case is individual). Later on, you may also be able to offer support to newer parents.

Some of the following suggestions may be of help to some parents.

Take one day at a time.

Try to have a routine involving rest and sleep.

Regular exercise may help to relieve stress and tension.

Have a balanced diet with limited junk food and plenty of water.

Talk about your feelings with family, friends and staff.

Visit your baby as often as you can.

Don't feel guilty if you cannot visit as often as you would like or if you miss a day or two. Some parents have many other family or work commitments or may live a distance from the hospital.

Take plenty of pictures and get involved in your baby's care.

Spend time with your other children, family and friends.

Let family and friends help, for example with other children or household tasks.

Some parents find it helpful to keep a diary, even if it's only a few lines each day.

Brothers and Sisters

Brothers and sisters, grandparents and other close family and friends may also be affected by your premature or ill baby. Unfortunately children cannot visit the unit. But you can help them stay in touch with the new baby by asking them to make cards or pictures to hang near the baby's incubator. Give your older child a picture of the baby and put one up at home. Talk to them about their new baby and answer any questions truthfully at their level of understanding. Bring in a picture of the older children to put on the baby's incubator.

Finding out how your baby is doing

You may talk to us if you wish to know any information or if you have any concerns about your baby at any time. We will always keep you up to date on his progress. Please ask about the treatment he is receiving and why. It is important that you understand what is happening so that we can work together with you to make sure that he receives the best possible care. Please be patient if you have to wait a few minutes until his nurse is free to speak to you.

You are welcome to telephone any time of the day or night. Try not to phone at shift changes. The nurse caring for your baby will give you an update on how he is doing. But please ask relatives and friends not to phone us as we can only give information to you, the parents. The neonatal registrar can give you regular updates when you visit. A consultant is available after the ward rounds most days or an appointment can be made for you to speak to the consultant caring for your baby.

Please check with the nurse that we have the correct telephone numbers so that we are able to contact you at any time.

Facilities

There is a family room located outside the entrance of the Neonatal Unit which provides tea and coffee making facilities and a quiet place for parents to take some time out. There you often get to meet and know other parents who are also going through a similar journey.

Toilet facilities are located just around the corner from the family room towards the entrance to the prenatal ward.

The Canteen, located on the lower ground floor (-1) offers a range of healthy options including hot dinners and a soup and salad bar. There is also a Deli shop available at the hospital front entrance. Please ask about the opening times. Water coolers are available inside the main entrance to the unit.

Lockers are available on a daily basis for parents to store their belongings safely. These are located on the corridor opposite the door of the unit. A €1 coin is needed for access, that is returned after use.

Car parking on hospital grounds is available for a fee during off-peak hours. There is disc parking on the street and a number of multi-storey car parks available nearby. Please liaise with a staff member for further advice.

When needed, we can offer an interpreter service via phone or in person to ensure both parents can communicate with the neonatal team.

There are various online supports available. The contact details are at the back of the book.

Helping with Medical Research

Your baby is receiving advanced medical care thanks, in part, to many years of research. This research has led to dramatic improvements in the quality of life for both babies and their families. The Rotunda Neonatal Unit is a progressive unit that works hard to keep up with new developments in newborn care, and is constantly developing new and better ways of supporting babies in the Neonatal Unit and beyond. Research continues to be vitally important and you may meet people on the unit who are doing new studies. You may be asked if your baby could become involved. Becoming involved is entirely voluntary. It does not affect your baby's care in any way if you prefer not to join a study. You can also ask for your baby to leave the study at any time if you change your mind.

Multiple Births

You may have more than one newborn baby. It may be difficult to divide your time, but try to appreciate the unique qualities of each baby and avoid comparisons. Frequently they may have different needs so it is important that we individualise the care each baby receives.

The babies may be discharged at different times giving you different feelings and problems to cope with at the same time. It is not easy having one baby at home while another may still be in hospital. You will be given the additional practical support and advice you need.

There is a group called the Irish Multiple Births Association for parents of twins, triplets and more. Their contact is www.imba.ie

Remember to use alcohol hand gel on your hands before and after touching each baby.

The Neonatal Unit Environment

The Neonatal Unit can be a noisy and busy place, with lots of complicated looking equipment and alarms. At first, babies are usually nursed in an incubator wearing only a nappy. The incubator creates a stable warm environment that allows staff to observe him more closely. A probe may be attached to the skin to record his temperature and assist in adjusting the temperature inside the incubator. In the first week or so, humidity may also be added to the incubator. This prevents him from losing too much moisture through his fragile skin.

We try and reduce the bright lights by turning the lights down low whenever we can. We also place a fabric cover over his incubator to shield him from as much light as possible. We constantly try to reduce the noise levels. We have a daily quiet period in the unit between 1pm and 3pm when we lower the lights, reduce the noise levels and try not to disturb the babies unless absolutely necessary.

The type of equipment used for him will depend on his condition. The equipment is there to keep him safe, help his breathing and closely monitor his health. Each piece of equipment has a different alarm, which may ring frequently. These alarms are indicators for his nurse and do not necessarily mean he has a problem. Keep in mind that the alarms can be triggered by something as simple as your baby moving his arms or legs. Staff constantly check the monitors so you can try as much as possible to concentrate on and watch your baby. The nurse caring for him will be happy to explain the different equipment that is in use. As you visit, you will become more accustomed to the equipment and their alarms. Never silence or turn off an alarm please.

He may have a vital signs monitor which records his heart rate and breathing rate through leads attached to his chest. The amount of oxygen in his blood is recorded through a probe attached to his hand or foot. This probe shines a little red light onto his skin. His blood pressure may be recorded through a line in his umbilicus or a cuff on his arm or leg.

Vital Signs Monitor

Frequently babies in the unit will require an intravenous infusion (drip) until they can tolerate milk. These fluids are given through an infusion pump. Sometimes he may need some help with his breathing, requiring help from a ventilator or CPAP machine and these will be described later in the book.

For safety reasons all babies are attached to a monitor, either a vital signs monitor or an apnoea monitor (a monitor that alarms if a baby stops breathing).

Smaller babies start being dressed when they are stable even if still in an incubator. Some bigger babies may be dressed and nursed in a cot. You may bring in clothes and blankets. We will leave any dirty laundry in a bag in his incubator or cot for you to collect and wash. Unfortunately, the hospital cannot be held responsible for any lost or mislaid items.

Premature Baby

A premature baby is a baby born before 37 weeks gestation. A premature baby looks and acts differently to a term baby and the more premature the baby, the greater the difference. He may be very small but is perfectly formed with eyelashes, hair and fingernails. His skin can appear very red, thin and fragile and may have a covering of fine protective hair called lanugo, which disappears as he grows. There may be very little fat covering his bones. His head may look as if it is too big for his body. If he is very immature (<26 weeks) his eyes may be fused (closed) at birth but will open in time. His ears are soft, flat and bend easily, but over time as cartilage develops, they will become stiffer. His movements are often jerky or jittery and occur in short bursts of activity. He will spend a lot of time sleeping in the first few weeks.

At first he needs to concentrate on regulating his breathing and heartbeat, his digestive system and other basic functions. He can get cold very easily. All of these things require a lot of energy and growth from him. Over time he will become more alert, active and respond to the sound of your voice so do spend time talking and singing to him. As he matures and puts on weight, his skin, muscle tone and movements will become more like that of an infant born at term.

Outcomes

Babies born prematurely may survive and be healthy, may survive but have long-term difficulties or unfortunately, may not survive. With each additional week of pregnancy the chance of survival will increase and the risk of long-term difficulties will decrease.

Babies born prematurely are at increased risk of problems during the neonatal period. Complications may mean your baby has a prolonged hospital stay, or may involve your baby receiving care at other hospitals.

Problems associated with prematurity can be understood as short or long term complications. Short term complications usually present while your baby is still an inpatient. Long term complications may present in babies who survive the neonatal period and are discharged home. These are discussed in more detail further on in the book.

We will continually keep you informed of your baby's progress.

Corrected Age

Corrected age counts the baby's age from the time he should have been born (40 weeks) and not the time he really was born. For example if he was born 8 weeks early at 32 weeks, and is now 10 weeks old, his corrected age is 2 weeks old. (10 weeks old – 8 weeks premature = 2 weeks corrected age).
A premature baby who is 6 weeks old does not behave the same as a term baby who is 6 weeks old. e.g. a baby born 8 weeks early may smile 8 weeks later than a term baby born on the same day.
The corrected age is used to assess all his milestones for 2-3 years.

Developmental Care in the NICU

Developmental care means letting the baby's behaviour guide his contact with other people. He is at the centre of all our interactions which means that we care for him in such a way as to try and always provide a positive sensory experience for him. Most healthy term and late preterm babies enjoy being spoken to, sung to, held and rocked. These actions also help the baby develop. However, some preterm or ill babies may find these same actions stressful.

Here in the Rotunda, we recognise that parents are best placed to know and understand their own babies. We will help you to discover ways of adapting to your parenting roles at different stages of his neonatal journey. Your baby is able to communicate with you through his behaviour and you can learn ways to tune in to his language by watching and interacting with him.

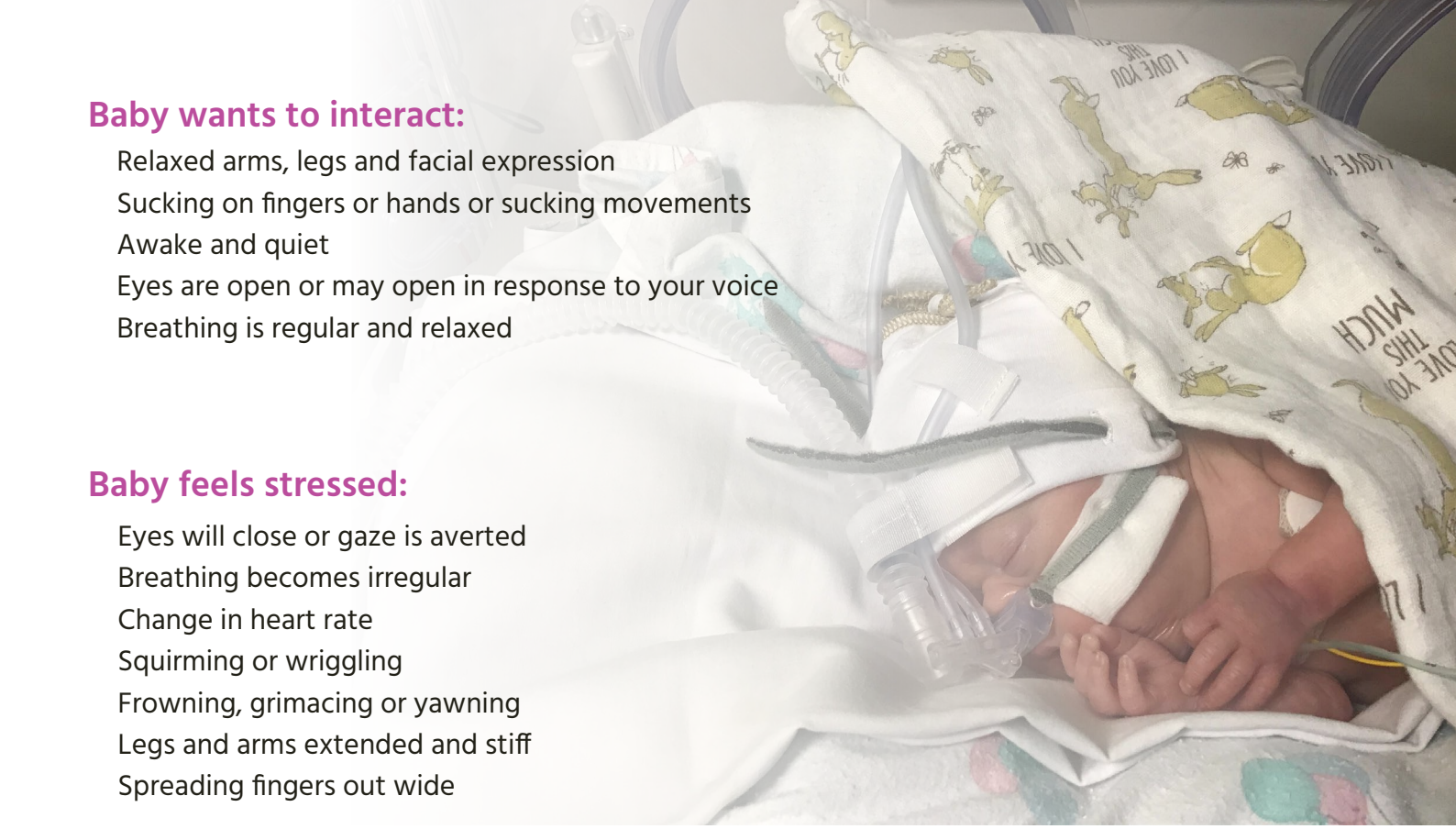
Here are some tips to get started

- Your baby knows your voice well and talking to him gently can be a source of great comfort. You will see how your baby reacts to your voice in a different way. Reading stories can be a lovely way of letting your baby know you're near and a great way to start promoting early language skills.
- Watch your baby. Spending time with your baby will allow you to tune in to how he reacts to things around him. You will learn to know when he is comfortable and what disturbs him. Pay attention to how he moves, his breathing pattern, his expressions and his sleeping patterns. You will learn to know your baby inside out and what his likes and dislikes are.
- Your baby knows your touch is different to everyone else. Comfort holding with calm still hands or offering your finger for baby to hold can help to soothe him when he is unsettled. Have plenty of Kangaroo Care once he is ready.

The health care team will help you to learn when your baby wants to interact and when he is stressed. Every baby is different, but you may see some of the following behaviours:

Baby wants to interact:

Relaxed arms, legs and facial expression
Sucking on fingers or hands or sucking movements
Awake and quiet
Eyes are open or may open in response to your voice
Breathing is regular and relaxed



Baby feels stressed:

Eyes will close or gaze is averted
Breathing becomes irregular
Change in heart rate
Squirming or wriggling
Frowning, grimacing or yawning
Legs and arms extended and stiff
Spreading fingers out wide

Remember that some babies, particularly in the early stages, get stressed if there is too much going on. Try doing just one thing at a time such as speaking or touching.

When your baby is saying 'time out', it's best to stop what you are doing. Let him rest or calm him with a comfort hold. If you must continue what you were doing like changing a nappy, restart more slowly and quietly.

Babies are 'nested' in their incubator. A nest gives them boundaries and helps to keep them in a tucked and flexed position. The nest should be snug but also give room for him to move his arms and legs. When he kicks, he will feel calmer if his feet touch the nest boundary. He should be able to bring his hands and fingers near his face. When on his side, his arms and legs are brought close to his stomach and chest. A light sheet may be placed over him to form a 'cocoon'.

When your baby arrives early, much of the growing he will do is outside of the womb environment. This means that he is learning how to move and experience the world in a different way. His experience of moving against gravity, sound, light, taste, touch and smell will be different to a baby that is doing their growing in the womb. Therefore positioning and handling are important for the development of movement and to make him feel secure.

Your baby may meet a physiotherapist during his stay in the unit who will talk to you about the importance of developmental care. They will watch him moving to see how his muscles are developing. As he gets closer to going home, the physiotherapist may do an assessment of his movement and show you some exercises to do at home. Often your baby will need to come to physiotherapy for follow up after he has gone home to make sure that he is reaching his developmental milestones such as rolling, sitting and crawling.

Tentacles for Tinies

Tentacles for Tinies is a way of providing some comfort and support to our premature babies in the form of crochet octopus teddies. These are specially designed and knitted to a specific pattern by our Rotunda Knitters. The tentacles of the octopus resemble the umbilical cord. The tentacles are small enough for their tiny hands. Each premature baby will be given a male and female octopus. An information leaflet will tell you about the care and washing of each octopus. If your baby requires humidity on admission, he will not receive the teddies for a week or so until after humidity has been discontinued.

Beads of Courage

The Beads of Courage Programme was introduced to the Neonatal Unit to offer support to, and to involve parents in, their baby's neonatal journey. All babies born at 30 weeks gestation or less can be entered into the programme. Each baby will be provided with a bead bag, a journal, a piece of string and beads that spell the baby's name. The journal is a log of the procedures, treatments and milestones that babies experience when born prematurely. Parents update the journal regularly. Colourful beads, each bead with a different meaning, are then given to parents. Through the programme, parents and their baby can tell their own unique story.

Nutrition

Nutrition is important for your baby's growth and development in both the short and long term. We aim to provide nutrition as soon as possible after birth, ideally with your breast milk. Feeding your baby in the neonatal unit may be different from what you had planned but we will work with your baby and you to make the best feeding plan.

If your baby is well enough to suck and feed orally by breast or bottle, this will be encouraged. However, premature or ill babies are often too weak to suck from the breast or bottle. These babies will be given milk via a feeding tube until they are able to suck efficiently.

Sometimes it takes time for premature or unwell babies to tolerate full milk feeds. These babies are given nutrition through a vein (intravenous nutrition) until they are able to tolerate full milk feeds.

Intravenous (IV) Fluids / Parenteral Nutrition (PN)

The first issue, following birth, for premature or ill infants is to regulate breathing and heart rate. Therefore it may take some time before your baby's digestive system is able to tolerate full milk feeds in their gut. In the meantime glucose and nutrients can be given directly into the bloodstream through a cannula (a drip). A vein through the umbilicus or tummy button may be used at first and later a vein in his arm or leg.

Intravenous (IV) fluids provide carbohydrates (sugar) and/or electrolytes (salts) and are generally used in the very short term e.g. a few days. Babies that need fluids for a longer period of time will require intravenous nutrition with carbohydrates, proteins, fats, vitamins and minerals, and this fluid is called Parenteral Nutrition (PN). This is a more complete type of nutrition and is commonly used for very premature babies. It allows babies to absorb nutrients and grow, while milk feeds are withheld or while only partial milk feeds can be given to your baby. As milk feeds gradually increase, PN is reduced and then stopped when he can tolerate full milk feeds.

Breast Milk

Breast milk is the best milk for your baby as :

- It is uniquely designed for him.
- Meets his nutritional needs.
- Is more easily digested.
- Offers protection from infection.
- Strengthens his immune system.
- Enhances cardiac function in premature babies.
- Encourages gut development.
- Promotes brain development.
- Has a long term health benefit.

If you had planned on breast feeding your baby, you can still do so even if your baby is premature. It may be some time before he is able to feed directly from the breast but you can still give him the best start by expressing your milk. If you had not planned on breast feeding, we would strongly encourage you to express breast milk even if it is only for a short while. Every drop of breast milk is valuable for all babies, but especially for premature and ill babies.

As he transitions to oral feeds, you will be assisted to position and latch him to the breast. If you do not intend to feed directly at the breast you will continue to be supported to express your breast milk.

Expressing Your Breast Milk

It is important to start expressing as soon as possible following delivery, ideally within the first hour. By expressing milk regularly, every two to three hours during the day and one 4 hour break at night, (minimum of 8 times in 24 hours), you will stimulate your milk supply in the same way as a baby suckling. In this way, your milk supply can be established and maintained until your baby is fit to feed from the breast.

Hand expressing is encouraged in the days immediately following delivery. Colostrum is the milk produced in the first few days after delivery. It is creamy in colour, 'Liquid Gold,' and is small in volume compared to later volumes. It is particularly viscous and hand expression ensures that it can be collected without fuss or risk of loss within the pump tubing. Initially, a breast pump can be introduced on a programme to stimulate the breasts in addition to hand expressing. Combining hand expression and pump use helps to increase supply. As volume of milk increases, move on to pumping programme on the breast pump.

The nurse or midwife will show you how to hand express and you will be provided with an expressing pack with the necessary information. It can take time to learn this skill so please be patient. When you graduate onto pump expressing, we will show you how to use the pump.

It is important to wash your hands thoroughly before you start. It is recommended to massage each breast prior to expressing. Always hand express for a couple of minutes at the beginning and the end of each session.

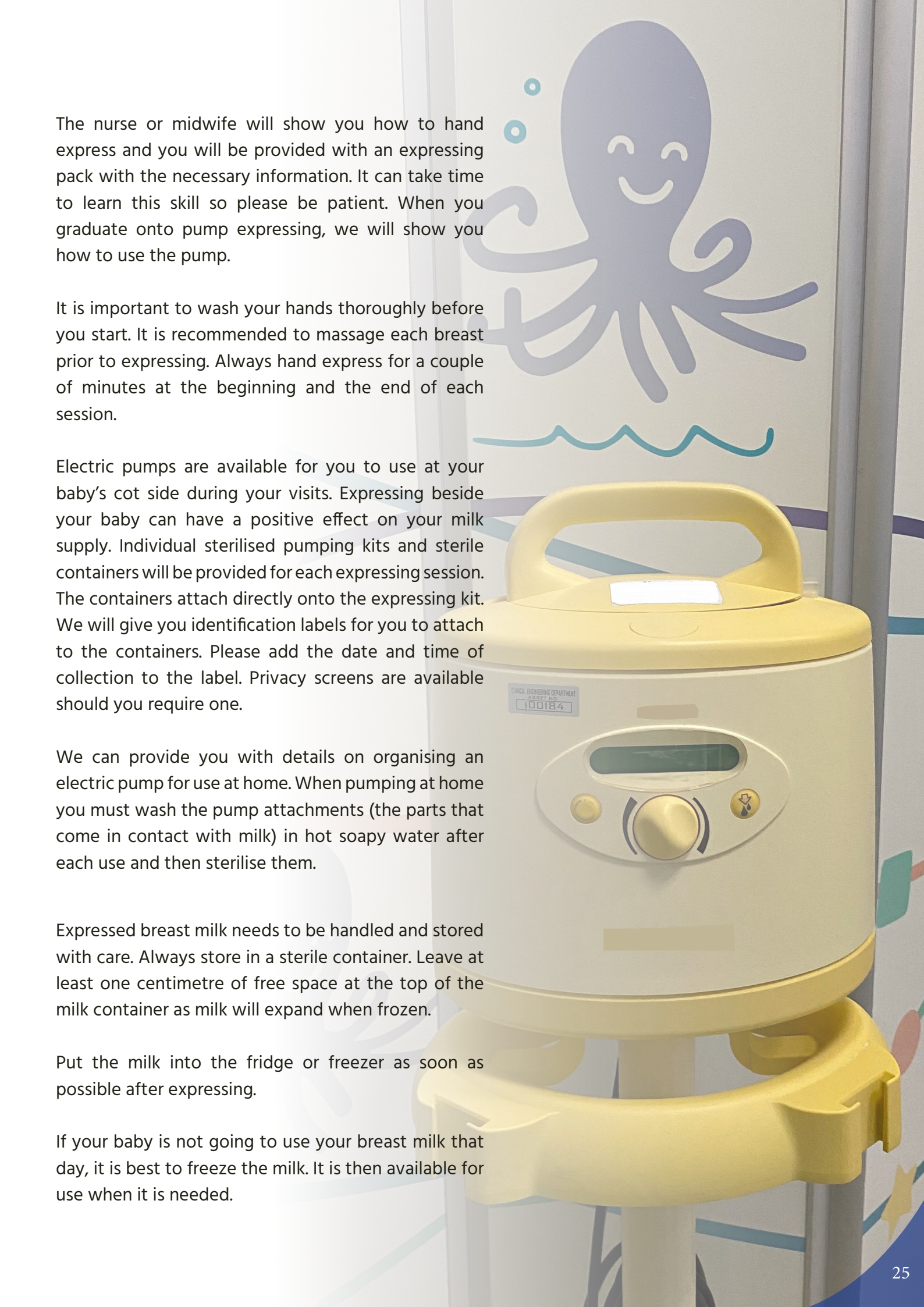
Electric pumps are available for you to use at your baby's cot side during your visits. Expressing beside your baby can have a positive effect on your milk supply. Individual sterilised pumping kits and sterile containers will be provided for each expressing session. The containers attach directly onto the expressing kit. We will give you identification labels for you to attach to the containers. Please add the date and time of collection to the label. Privacy screens are available should you require one.

We can provide you with details on organising an electric pump for use at home. When pumping at home you must wash the pump attachments (the parts that come in contact with milk) in hot soapy water after each use and then sterilise them.

Expressed breast milk needs to be handled and stored with care. Always store in a sterile container. Leave at least one centimetre of free space at the top of the milk container as milk will expand when frozen.

Put the milk into the fridge or freezer as soon as possible after expressing.

If your baby is not going to use your breast milk that day, it is best to freeze the milk. It is then available for use when it is needed.



Keep it cold or frozen on route to hospital. Use a cool bag with ice blocks. If frozen, please be careful that the milk remains frozen while you are bringing it into the unit.

Milk expressed in the unit or just before you leave home to come to the unit, should not be frozen, but cooled in the fridge. We can give it fresh to your baby.

Please see our information leaflet on the expressing, storage and transport of breast milk for further details.

It is important for you to eat a well-balanced diet, have regular meals, drink fluids and have plenty of rest. Please let us know if you are taking any medication, either prescribed or otherwise.

Lactation Consultants are available with help and advice. Ask the nurse looking after your baby if you would like to speak to them. You can also contact them directly on **Tel:** (01) 873 0700 **Bleep** 471.

The Rotunda Hospital website (Parent Education section) has educational videos on expressing and breast feeding.

Alternatives to Breast Milk: Formula Milk and Donor Expressed Breast Milk

We encourage all mothers to breastfeed or express breast milk. Sometimes this is not possible even under the best of circumstances. It is normal to feel upset if this happens. You should never feel guilty that you didn't try hard enough or for long enough. Accept that you made the best choice for you and your baby. If you are unable to provide breast milk for your baby, staff in the neonatal unit will provide guidance on alternatives.

Formula milk

Formula milk is usually made from cow's milk and modified to make it suitable for babies but it can never replicate the benefits of maternal breast milk. If your baby was born at term, term or a "first" infant formula may be given to your baby for all or some of his feeds. If your baby was born premature, a preterm infant formula with higher energy, protein, minerals and vitamins will be used.

Donor Expressed Breast Milk (DEBM)

If your baby is very premature or very small, it is important that he receives breast milk as soon as possible after delivery. If mum is unable to express milk, we sometimes use breast milk that has been donated by another mother as a short term alternative. Donor expressed breast milk can be very helpful but it can never replicate the benefits of maternal breast milk. DEBM is tested and pasteurised in a human milk bank before it is given to babies. It is used only in the short term as the pasteurising process can reduce some of its nutritional value and benefits. We will ask you for your consent before we give donor breast milk to your baby.

Breast Milk Fortifier (BMF)

Preterm babies have increased nutritional needs and require extra protein, energy, minerals and vitamins over and above what they get in breast milk to help them grow and develop. Therefore, we fortify expressed breast milk with a Breast Milk Fortifier.

Tube Feeding

Even after your baby can manage to digest milk, it may be some time before he is strong or mature enough to suck from the breast or bottle. The sucking reflex usually matures at around 33 – 35 weeks gestation. In the meantime, he will be fed through a fine soft plastic tube passed through his nose or mouth and into his stomach. A feeding tube passed through his nose and into his stomach is called a nasogastric tube. A feeding tube passed through his mouth into his stomach is called an orogastric tube. A syringe is attached to the feeding tube and milk is placed in the syringe. Gravity gradually pulls the milk down into his stomach. At first we may feed him as little as one or two mls every 2 or 3 hours. Sometimes babies do not tolerate even small amounts of milk so we may have to stop and wait a day or two and then try again. When he is tolerating his milk feeds, he will be given larger volumes of milk in a step-wise manner. We will encourage you to visit at feeding time so that you can give him his tube feed. As he gets stronger, breast or bottle feeds will be gradually introduced until he no longer requires tube feeds. If it is your intention to breastfeed, it is recommended that the first oral feed is started at the breast. This may not be a full feed and will more likely be a lick or one or two sucks but will be a step in the right direction. It may take anything from a few days to a few weeks to establish full oral feeds. We may introduce a soother to encourage and help him practise his sucking. This is known as non-nutritive sucking (NNS).

Non-Nutritive Sucking (NNS)

NNS is sucking for pleasure rather than for food. It is a pleasant oral experience and helps to make tube feeding more pleasurable. It helps to associate sucking with food particularly in premature babies. It also stimulates digestion. It is also a comfort for him during difficult experiences. It does not affect his ability to breast feed later on.

Oral Feeding or Feeding Your Baby by Mouth

As soon as your baby is well enough and developmentally ready, you will be able to feed him orally. Breast and bottle feeds are referred to as oral feeds. We encourage all mothers to breast feed but sometimes this is not possible or you may choose not to do so. We will respect your choice.

Whether breast or bottle feeding, preterm babies need to learn to suck, swallow and breathe so it can take them a while to co-ordinate the feed safely. Be sure you are in a supported comfortable position before you start feeding. Support his head and body in a slightly upright position so that he can focus all his energy on feeding. Side lying may be a useful position for some babies but may not suit others.

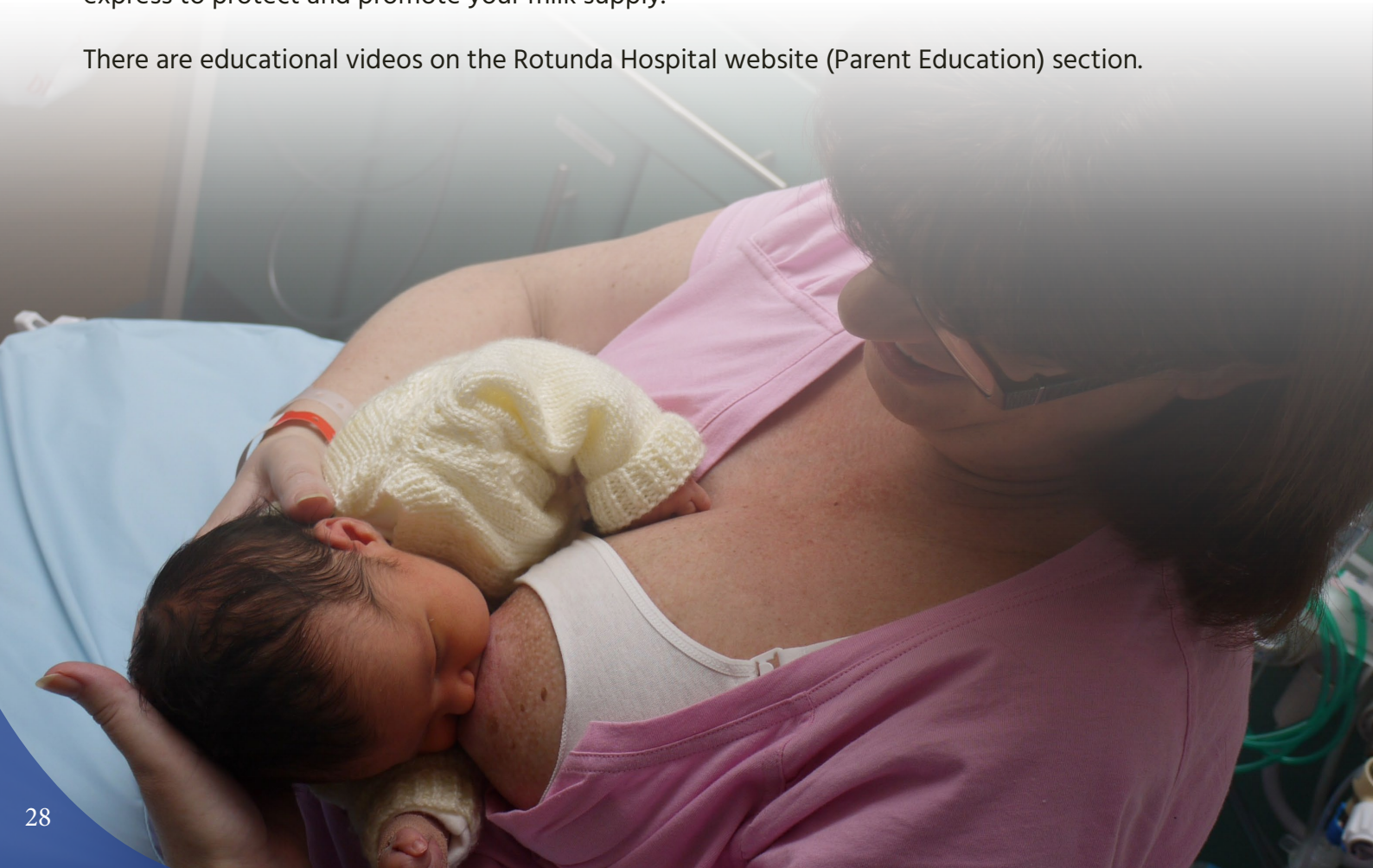
During feeding be sure that his tongue is not at the roof of his mouth. Check that he is sucking and swallowing correctly. Pace his feeds, allowing him time to suck, swallow and breathe. If he sucks without stopping to breathe, take the breast or teat out of his mouth and sit him up so that he can catch his breath. Each feed should take no longer than 30 minutes. Extra time for changing or winding may be required.

When he is learning to suck, he may only have energy to suck for small amounts of time. Therefore he will need the remainder of his feed via the tube. Over time we gradually increase the frequency and length of his oral feeds as he gets stronger and sucks better.

He will be fed every 3 to 4 hours. When you are visiting from home, telephone the Neonatal Unit to confirm the times his feeds are due at on that day, so that you can visit and feed him at this time.

Breast feeding is natural but that does not mean that it is instinctive or instantly easy. It is important to take one step at a time. The best time to give him his first breast feed is when he is wide awake and alert. The nurses will show you how to recognise feeding cues, how to latch him on and how to know when he is feeding well. Sometimes it may take a little time to establish breastfeeding so don't give up. If he is small, he may only be able to suck for one breast feed a day at first. You will need to continue to express to protect and promote your milk supply.

There are educational videos on the Rotunda Hospital website (Parent Education) section.



Weight Gain

Monitoring your baby's weight is important for monitoring his growth. His weight will be measured in grams. A gram is a smaller unit than an ounce. Therefore, it is easier to recognise small changes in his weight.

His birth weight reflects the amount of growth and development that occurred whilst he was in the womb. The relationship between his birth weight and gestational age indicates how well he grew before birth and whether he is small, appropriate or large for gestational age.

All babies lose weight after birth and this loss can often be up to 10% of their birth weight. Most term babies regain their birth weight by 10 to 14 days of age. Sometimes babies are slower to regain their birth weight but this usually resolves with time. Thereafter, babies typically gain weight steadily, averaging around 10–30 grams per day or 150-200 grams per week. Some days his weight may go up, other days stay the same and occasionally go down. Each baby will develop their own weight pattern.

Your baby will be weighed when he is admitted to the neonatal unit. He will also be weighed frequently during his stay with us as we monitor his weight gain and growth.

Respiratory Care

Many babies admitted to the Neonatal Unit have some degree of breathing difficulty. If the respiratory distress is mild, increasing the percentage of oxygen in the air that the baby breathes may be sufficient. If this is not enough, she may need extra help to breathe and oxygenate her lungs, for example by either Assisted Ventilation, Continuous Positive Airway Pressure or High Flow Nasal Cannula therapy.

Respiratory Distress Syndrome (RDS)

As a baby breathes, tiny sacs called alveoli, in the lungs, move oxygen from the air into the blood stream. The alveoli expand when a baby breathes in, and get smaller when she breathes out.

The lungs make a liquid called surfactant that coats the alveoli in the lungs and allows them to open and close more easily. Surfactant is produced in the developing lungs from 20 weeks gestation onwards but the greatest production occurs in the last six weeks of pregnancy. Therefore premature infants have less surfactant than term infants.

Respiratory Distress Syndrome (RDS) is the most common condition that affects premature infants. It is due to immature lungs and an insufficient amount of surfactant. Mothers may have been given steroid injections before delivery to try and help mature the baby's lungs.

When the alveoli do not open and close easily, breathing becomes much more difficult. Baby breathes quicker, there may be drawing in of the skin and muscles between the ribs or just below the rib cage (retraction) and a grunt or moan may be heard when she breathes out. RDS may worsen over the first 72 hours, stabilise and then begin to improve as the lungs start to produce more surfactant. When needed, we can give her extra Surfactant (Curosurf) through her breathing tube, often within minutes of birth, to add to her own surfactant to make breathing easier.

Continuous Positive Airway Pressure (CPAP)

The CPAP machine works by blowing warm moist air and oxygen into baby's lungs under a slight positive pressure. The gas can be delivered by nasal prongs (soft plastic tubes in her nose) or by a mask fitted over her nose.

The prongs or mask are then held in place by ties to a cap on her head. She is doing all the breathing herself but the positive pressure from the CPAP machine prevents her lungs from emptying completely, therefore making breathing easier. Additional oxygen can be given as needed.

CPAP can be used from birth. It is also used to help her go from the ventilator to breathing on her own. It is not uncommon for babies to need CPAP on and off for quite a while as the lungs mature and develop.

Bi-level Positive Airway Pressure (BiPAP)

BiPAP is similar to CPAP. It works the same way as CPAP but also gives a slightly higher pressure when the baby takes a breath in. A certain rate is also set. Therefore she gets a little more help than with CPAP alone.

High Flow Nasal Cannula (HFNC)

High Flow Nasal Cannula is a way to give warm moist air and oxygen to the baby's lungs via small prongs in the nose. It is delivered at a set flow rather than a set pressure. It can be used from birth. It is often used to help him wean from the ventilator or the CPAP machines.

Oxygen

Some babies need low levels of oxygen when they come off CPAP or High Flow. This can be given through the incubator or through tiny tubes placed by the nose called nasal prongs. Some babies may need this oxygen for quite a long period of time and some even go home with nasal oxygen.

Mechanical Ventilation

A ventilator is a breathing machine, which can either help, or if necessary take over completely, a baby's breathing. A soft plastic tube (an endotracheal tube) is passed gently through her mouth and into her trachea or windpipe. The other end of the tube is attached to a ventilator that will blow warm moist air and oxygen into and out of her lungs. The doctors and nurses adjust the settings on the ventilator depending on her condition. As she improves and is weaned off the ventilator, she will breathe more on her own in preparation for the removal of the tube. This process of weaning may take anything from a few hours to a few weeks.

Some babies may require a different form of ventilation called High Frequency Oscillatory Ventilation (HFOV). This is a method of mechanical ventilation that delivers very fast small breaths and it will seem as if your baby's chest is vibrating.

Nitric Oxide

Nitric Oxide is a gas that is naturally produced by the body and helps relax blood vessels. On some occasions it is needed to help ventilation by relaxing the blood vessels in the lungs. This gas is given directly into the lungs via the breathing circuit of the ventilator.

Respiratory Conditions

Broncho-Pulmonary Dysplasia (BPD)

Broncho-Pulmonary Dysplasia (BPD) is a chronic lung condition that occurs mainly in premature infants who have been mechanically ventilated, required CPAP and/or received oxygen for RDS. The alveoli get damaged which leads to the development of abnormal alveoli and scar tissue. The presence of scar tissue causes small areas of the lungs to collapse and other areas to trap air and expand. Mucus production is increased. Babies with BPD may experience spasms or tightening of the airways similar to what is seen in asthmatics.

The aim of treatment is to allow the baby's lungs to heal and new undamaged lung tissue to grow. It is often difficult to wean her from her breathing support, her oxygen and to establish feeds. Sometimes we may have to give her medication to help her. As she grows, her condition will generally improve.

Apnoea and Bradycardia

All newborns tend to have an irregular breathing pattern with episodes of very quick breathing followed by a pause. Premature babies may also have an immature breathing centre and so 'forget to breathe', which is called apnoea. Apnoea may also be accompanied by a bradycardia, where the heart rate slows down. The oxygen levels in the blood may also fall and this is called a desaturation. An alarm sounds instantly a problem occurs, and nursing staff help at once by gently patting her back or stroking the soles of the feet to remind her to breathe. Medicine called Caffeine, is usually given. Caffiene is a drug that stimulates breathing. Babies grow out of these apnoeas in time, usually at around 34 weeks gestation but for some babies this may take a little longer. All babies will be apnoea free by the time they go home.

Transient Tachypnoea of the Newborn (TTN)

While your baby was in the womb, her lungs were filled with fluid. During delivery, much of this fluid is pushed out of the lungs or reabsorbed into the blood stream, so that she can start to breathe. If some of this lung fluid remains, rapid breathing results, called Transient Tachypnoea of the Newborn or TTN. This condition is more common in babies born after 34 weeks gestation and those born by caesarean section, especially if labour never started. Treatment may involve providing extra oxygen, or sometimes more assistance to help her breathe. It gradually improves over the first few hours or days of life. Generally she will not be fed until her breathing has settled and so she will need intravenous fluids.

Pneumothorax (Collapsed Lung)

Air can sometimes leak from damaged air sacs in the lungs, into the space surrounding the lungs, forming a pneumothorax. Breathing becomes harder and she may require extra oxygen or more assistance to help her breath. It may also be necessary to pass a small tube through the chest wall to let the air escape. She will be given a local anaesthetic and pain relief prior to the insertion of the chest tube.
Some newborns, generally the bigger babies, may have a 'spontaneous pneumothorax' after birth. Usually, allowing these babies to rest, giving intravenous fluids and oxygen for a few hours or days will be all that is needed.

Meconium Aspiration Syndrome (MAS)

Meconium is the normal first stool passed by all babies. It is thick, sticky and dark green in colour and consists of amniotic fluid and cells. It is usually passed following delivery but may be passed by the baby before birth. Amniotic fluid is the normal fluid around the baby in the womb.

Meconium Aspiration Syndrome is a lung condition caused the by the aspiration/inhalation of meconium before or during birth. The inhaled meconium irritates her airways and makes it difficult to breathe. Mild cases may be treated by allowing the baby to rest and giving extra oxygen. More severe cases may require mechanical ventilation.

Persistent Pulmonary Hypertension of the Newborn (PPHN)

PPHN happens when a newborn's circulatory system does not adapt to being outside the womb. In the womb a baby receives her oxygen from the placenta. Very little blood flows to the lungs as they are not being used.

After birth, when a baby starts to breath air, more blood flows to the lungs to pick up oxygen. Babies with PPHN have high blood pressure in the blood vessels in the lungs. As a result, blood flow to the lungs does not increase enough to allow the body to get enough oxygen.

PPHN can occur as a result of a infection, Meconium Aspiration Syndrome, birth asphyxia or other lung problems.

The treatment of PPHN is determined by the cause and the severity. Treatment involves giving her extra oxygen. This extra oxygen increases the amount of oxygen in the blood and helps increase blood flow to the lungs. Mechanical ventilation may be necessary. Drugs such as Nitric Oxide help to lower the pressure in the blood vessels in the lungs. In very servere cases ECMO may be necessary.

ExtraCorporeal Membrane Oxygenation (ECMO)

ECMO is like a heart-lung machine and temporarily takes over the work of the heart and lungs so that they can rest and heal. It is used for babies who have reversible (not permanent) heart or lung problems or both. It is only used when usual treatments are not working. It does not cure the heart or lung disease, it only provides time for the baby's heart and lungs to heal.
It is a very specialised treatment and is not done in the Rotunda. Babies are transferred to CHI at Crumlin or to Stockholm in Sweden for treatment.

Neonatal Care

Medical Procedures and Treatments in the Neonatal Unit

Weighing

Babies are weighed on admission. Thereafter, they are usually weighed daily, generally at night time.

Intravenous (IV) Lines

Intravenous lines are used for drips and/or drugs. The line may be placed in the umbilicus, hand and arm, foot and leg or scalp. If a scalp vein is used, a small area of hair will need to be shaved but the hair will grow back again. Pain relief, such as Sucrose, and a soother can be given for the insertion of the line. Once the line is inserted, it does not cause her any pain.

Percutaneously Inserted Central Catheter (PICC)

Sometimes we insert a line into a deeper vein so that it will last for many days or weeks and this is called a Percutaneously Inserted Central Catheter (PICC).

Umbilical Catheters

Umbilical catheters are long, soft tubes that are inserted into the blood vessels of the baby's umbilicus (belly button). They are used mainly in the first few days after birth. There are two types of umbilical catheters called arterial and venous catheters.

The Umbilical Arterial Catheter (UAC) is inserted into an umbilical artery. This is used to take blood samples and to monitor blood pressure. An infusion is used to prevent the line from blocking.

The Umbilical Venous Catheter (UVC) is inserted into an umbilical vein. This catheter is used for nutrition and medicines. The UVC often has more than one tube so different fluids and drugs can be given through one entry point without them mixing.

Blood Tests

Blood tests can tell us a lot about baby's condition. Blood can be taken from the arterial line or from a vein in the hand or foot. The heel is used when only a few drops of blood are needed.

Newborn Bloodspot Screening (Heel prick)

This test is done on all newborn babies between 72 and 120 hours of age (day 3 to day 5). The test looks for some inherited metabolic disorders, Cystic Fibrosis and thyroid function problems. All these conditions are very rare but if present, early treatment is very successful in preventing long term complications. All tests are done on the same screening card.

You will be given information about the screening programme and asked to sign a newborn screening card to consent to the test being done. Some of the screening can only be done when the baby is digesting milk. Therefore the test will be repeated weekly until your baby is on full milk feeds. If premature, a final test will be done as near to term as possible and prior to discharge. Consent will only be sought for the first test.

X-Rays

X-Rays provide important information about your baby's lungs and internal organs. They are taken only when necessary and the radiation exposure is very low. Screens protect her when x-rays are being done on other babies.

Scans

Ultrasound Scans can be done on the brain and other parts of the body. Many babies admitted to the Neonatal Unit will have an ultrasound brain scan a day or two after birth. It is completely safe and is done with a machine similar to that which the obstetricians used to scan Mum during pregnancy. The scan works by passing sound waves through the soft spot on the head (known as the fontanelle) and gives a detailed picture of the brain. Further follow up scans are repeated as necessary. When scanning the brain, we are looking for any abnormality but in particular any bleeding called an Intraventricular Haemorrhage.

CT and MRI scans

CT and MRI scans give a more detailed picture of certain areas of the head and body. These are not performed in the Rotunda. They are done in the National Maternity Hospital, Holles Street (NMH) or Children's Health Ireland at Temple Street. If such a scan is needed, your baby will be transported, with a nurse, either by ambulance in a transport incubator or by taxi in a car seat for the scan and will return to the unit when the scan is finished.

Eye Testing

All babies with birth weights under 1,501 gms and/or less than 32 weeks gestation meet the eye screening criteria and need to have their eyes tested. The eye specialist (ophthalmologist) visits the unit each week and does the examinations.

Screening Protocol

Babies born before 27 weeks gestational age; the first examination takes place at 30 to 31 weeks gestational age.

Babies born between 27 and 32 weeks gestational age; the first examination takes place between 4 to 5 weeks of age.

Babies born >32 weeks gestational age but with birthweight <1,501 gms; the first examination takes place between 4 to 5 weeks of age.

All babies who meet the screening criteria will have their first screening done prior to discharge. Follow up examinations are repeated as necessary. The pupils of her eyes will need to be dilated (enlarged) for the examinations by using eye drops. The eye specialist is looking for a condition called Retinopathy of Prematurity (ROP).

Hip Check

All babies will have their hips checked before going home. We need to know if there is a family history of dislocated hips as we may need to do a hip ultrasound at 6-8 weeks corrected age.

Echocardiogram (ECHO)

An ECHO is a test that uses high frequency sound waves (ultrasound) to make pictures of the heart muscle and valves. It can also monitor the blood flow through the heart and surrounding blood vessels.

Lumbar Puncture

Sometimes if there is evidence of infection, doctors may want to investigate and take a sample of the fluid that surrounds the spinal cord. This fluid flows down from the brain, so analysing it should show if an infection is present. The doctor will insert a small needle between two bones low in the baby's back. A small sample of the fluid is taken and sent to the laboratory.

Blood Transfusions

When babies are ill, they need to have a lot of blood tests taken. Occasionally babies may lose blood around the time of labour and delivery. Newborn babies, and in particular premature babies, may not be able to make enough blood to replace these losses. Therefore anaemia, which is a low blood count, may develop and she may need a blood transfusion. The blood we give is carefully matched with Mum's blood and also screened for infections. The blood is given through her vein over several hours. A unit of blood is split into five smaller packs called Pedi-paks, thereby reducing the exposure to different donors. It is not unusual for premature babies to require one or more blood transfusions during their stay with us. An information leaflet about blood transfusions is available, please take one.

Cerebral Function Monitoring (CFM)

This is a means of monitoring the background electrical activity of the brain. Electrodes are placed on the scalp which can tell if a baby is having a seizure/fit.

Electroencephalography (EEG)

EEG is a test used to evaluate the electrical activity of the brain. An EEG tracks and records brain wave patterns using small flat metal discs, called electrodes, attached to the scalp.

Medical Conditions

Jaundice

In the womb, babies need a higher haemoglobin (Iron Count) to transport oxygen around their bodies. After delivery they do not need this high haemoglobin and so start to break down these blood cells.

Blood cells live in the body for a few days or weeks and are constantly broken down and new ones formed. Bilirubin, a natural pigment is formed when the red blood cells are broken down. Bilirubin is processed by the liver and excreted in urine and stool. Sometimes the rate of breakdown of the red blood cells, coupled with an immature liver in a newborn, can cause a buildup of bilirubin in the blood. This buildup of bilirubin causes yellowish discolouration of the skin and whites of the eyes and is called jaundice. Jaundice is a common condition in newborn infants but not all babies will require treatment. Babies who become jaundiced, often become drowsy and sleepy and can be difficult to feed. Bilirubin is very sensitive to light so special phototherapy lights are used. These lights work by shining a particular wavelength of light onto baby's skin. The light breaks down the bilirubin in the skin which can then be excreted through the urine and stool.

There are two types of phototherapy, 'biliblanket' and overhead lights. The biliblanket looks like a flat rectangular pad that glows with a bright yellow or blue light and is placed next to the skin, underneath the baby. This does not get hot or cause her any discomfort.

The overhead light, which is blue, is placed over the incubator and she is nursed without clothes so that the lights can act on her skin. She wears eye pads to protect her eyes from the bright lights. Sometimes both methods are used together. Depending on her condition, the lights can be stopped, eye pads removed and she can come out for short cuddles, skin-to-skin contact and for feeding. Sometimes the lights may cause a mild rash but this will disappear quickly once the lights are stopped.

Sometimes a baby can have a different blood group to mum. During pregnancy, mum may develop antibodies to baby's blood group. The antibodies can cause a greater breakdown of baby's blood cells. This can cause the baby to be more jaundiced and need treatment for longer. Sometimes we may give an immunogloblin infusion to help combat these antibodies.

Sepsis (Infection)

Newborn babies and in particular premature babies are more prone to infection. This may be because:

- Protective substances (immunoglobulins), from Mum, normally cross the placenta during the final weeks of pregnancy and therefore babies born prematurely may not have sufficient protection.
- The normal responses to fight infection may not be fully developed.
- The lines and tubes that are needed for treatment can pose an infection risk.

It is important that the early signs of infection are detected and treated quickly. A sample of blood will be taken for culture (to see if and what organism is causing the infection). A lumbar puncture may be done and a urine sample collected. Intravenous antibiotics are given straight away as the results of these tests may take 36 to 48 hours to return. These antibiotics are continued until the infection is out-ruled or adequately treated.

One of the aims of the care we provide for your baby is the prevention of infection. As was mentioned earlier, hand hygiene is by far the most effective tool in the prevention of infection. It is vital that you wash and carefully dry your hands on entering and leaving the unit and use the alcohol gel before and after handling your baby. This also applies to all hospital staff.

Low Blood Pressure

Premature and/or ill infants can have difficulty maintaining their blood pressure after birth. Treatments may include giving extra fluid, blood and/or medications.

Blood Sugar Problems

The amount of sugar in your baby's blood can be too high or too low. A small sample of blood is taken from her heel to perform the measurement. If the measurement is too low, it can be corrected by feeding or the use of Glucogel® (a high concentration of dextrose in a gel paste given into the cheek). We may also have to start or change the concentration of sugar (Dextrose) in her IV fluids. If the sugar levels are too high we may need to start an insulin drip. Blood sugar levels are monitored frequently until they are stable. (Blood sugar problems at this stage do not mean that your child will have an ongoing sugar problem.)

Necrotising Enterocolitis (NEC)

Necrotising Enterocolitis (NEC) is an inflammatory bowel condition affecting some premature and newborn infants. Preterm babies are more prone to develop this condition than full term babies. The reason why some babies develop NEC is not fully understood but it usually occurs when the blood supply to the infant's bowel has been reduced. Treatment includes withholding feeds for up to 2 weeks or longer and giving antibiotics to allow the bowel to recover and heal. Parenteral Nutrition is given until milk feeds can be tolerated again.

Although potentially a very serious complication, most infants will recover without any further problems. In a minority of cases, the bowel wall may perforate (rupture) and surgery may be required.
Breast milk has been shown to reduce the incidence of NEC and for this reason we strongly encourage you to consider expressing breast milk for your baby.

Patent Ductus Arteriosus (PDA)

In the womb, the blood circulating through your baby's heart follows a route, the foetal circulation, which allows blood to by-pass the lungs, through a blood vessel called the Ductus Arteriosus. This is because your baby does not need to use her lungs as she gets her oxygen supply from Mum through the placenta. Following delivery, blood is redirected to her lungs as she needs to breathe in oxygen herself and the Ductus Arteriosus begins to close. Sometimes, especially in premature babies, this vessel remains open after birth or reopens in the weeks following birth. This is referred to as a Patent (meaning open) Ductus Arteriosus.

If this happens, some of the blood flow will bypass the lungs. Her heart has to work harder and she may need more oxygen and breathing support. A heart murmur can be heard. An ECHO (ultrasound of the heart) is usually performed to see how big the duct is and if treatment is necessary.

If the PDA is small and not causing any problems, treatment may not be needed. A larger PDA that is causing difficulty for her may require treatment. Medical treatment includes a reduction in the amount of fluid given to her and a medication to try and close the ductus. Infrequently, surgery may be necessary and if so, is performed in Children's Health Ireland (CHI) at Crumlin.

Intraventricular Haemorrhage (IVH)

Intraventricular Haemorrhage (IVH) refers to bleeding into the natural spaces (ventricles) that exist in the brain. Premature babies are prone to these bleeds as their blood vessels are immature and fragile. Generally a baby with an IVH shows no signs of bleeding and the bleed is detected by the ultrasound scan. When the amount of bleeding is small, the body gradually reabsorbs the blood over two to three weeks (just like a bruise). Larger bleeds may leave damaged tissue behind.

Most haemorrhages are mild (Grade 1 & 2) and usually resolve without further problems. Larger bleeds (Grade 3 & 4) can result in more significant short and long-term complications.

Retinopathy of Prematurity (ROP)

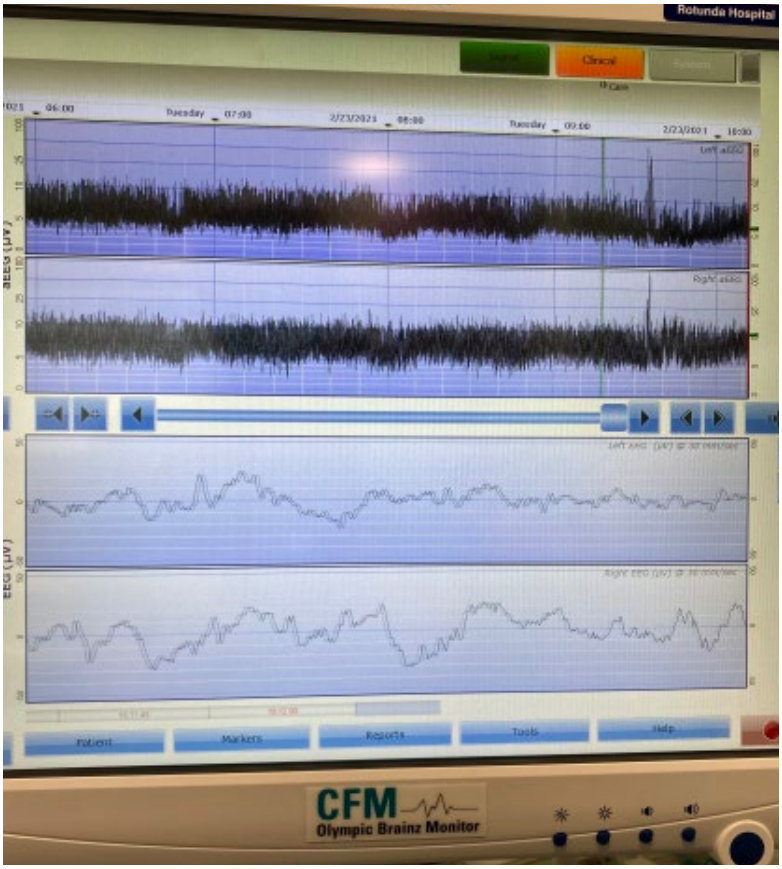
Retinopathy of Prematurity (ROP) is a condition where some abnormal blood vessels grow in the back of the developing eye of the premature or low birth weight infant. The Ophthalmologist (eye specialist) will monitor her eyes regularly. Mild ROP will usually resolve spontaneously. However, moderate or severe ROP occasionally requires treatment. During treatment, the Ophthalmologist may inject a special substance directly into the eye, or use laser therapy (beams of light) directed into the eye, to destroy these abnormal blood vessels and stop them growing. We will give her pain relief before and during the procedure. Treatment is usually very successful. After discharge, her eyes may be monitored in CHI at Temple Street, and it is **very** important that she keeps these appointments.

Hernias

Hernias are common in premature infants and often disappear without treatment. The most common hernia is called an **inguinal hernia**. It occurs more frequently in boys and usually presents as a bulge in the groin particularly after crying. The hernia will be monitored and as long as it can be gently and easily pushed back through the opening, immediate surgery is not necessary. The hernia will require surgical repair when the baby is stronger. **Umbilical hernias** cause the belly button area to push outward when the baby cries. These tend to correct themselves without any treatment as the abdominal walls strengthen and thicken.

Seizures

When a baby has abnormal movements of her arms, legs or eyes, we say she may have had a seizure. Seizures can be caused by infection, brain injury, metabolic or endocrine problems. We use medication to stop the seizure activity. A cranial ultrasound of her brain will be done as soon as possible. She may have Cerebral Function Monitoring (CFM) done also. This involves placing tiny electrodes on the scalp. The machine then records the background electrical activity of the brain over a few hours or days. An EEG which measures the electrical impulses of the brain may also be done.



Sometimes an MRI scan may be necessary. This may be done in Children's Health Ireland at Temple Street or National Maternity Hospital, Holles Street (NMH).

Long-term outcome depends on the cause and severity of the seizures. She will be followed up to check on her progress as she continues to grow and develop.

Neonatal Encephalopathy (NE)

Sometimes during pregnancy, prior to or during birth, there may be a reduction in the oxygen supply to the baby from the placenta. This can affect all of her organs, but especially the brain resulting in a brain injury called Neonatal Encephalopathy (NE). There are different degrees of NE and the treatment and long term outcome depends on the severity of the injury. In some cases, we may use Therapeutic Hypothermia to try and limit the degree of brain injury.

Therapeutic Hypothermia / Total Body Cooling

Therapeutic Hypothermia means that her body temperature is cooled from the normal temperature of 37^{O}C, down to a temperature of 33.5^{O}C.

Her temperature is kept this low for three days (72 hours) and then she is rewarmed slowly over 16 hours. The cooling is started as early as possible after birth and within the first 6 hours. She will be nursed on a special mattress that can be cooled or warmed according to her needs.

During the treatment, she will be monitored closely and given pain relief and sedation as necessary. She will not be fed and will need intravenous fluids. Sometimes she may also need to be ventilated. The period of cooling gives the brain a chance to recover from the injury.

Not all babies are cooled as we have certain guidelines that we must follow.

Transfer of your Baby

Not all hospitals provide the same services. Occasionally babies need to be transferred to the paediatric hospitals from the Rotunda for additional specialised medical or surgical treatment. Babies also come from smaller hospitals to the Rotunda. There is a dedicated National Neonatal Transport Programme (NNTP) which transfers sick babies between hospitals. This transport team is an "NICU on wheels" and full intensive care can be given on the journey.

For parents this is always an anxious and worrying time. We will ask for your permission before she is transferred and you will be kept fully informed at all times. When the initial problems have been sorted, she may be transferred back to the Rotunda Hospital from the paediatric hospitals. For babies born elsewhere, we try to transfer them back to their local hospital as soon as they are well enough to travel. This also applies to mums who have been transferred antenatally to allow their baby to be born in the Rotunda. This helps local teams to get to know your baby before discharge. They can then plan follow up care and local supports for after your baby goes home.

If we have to give you some bad news....

Unfortunately, sometimes, we have to tell you some bad news about your baby. She may have problems that will cause her long term disabilities. She may be too premature or too ill to survive. It can be very difficult to accept, with advanced medical knowledge and modern technology, that sometimes babies don't do well or have conditions which cannot be treated. We try to talk to both parents together, in private, and to talk to you as soon as we realise there are problems. The first discussion will be short as parents are often too upset to remember all that is being said. When you are ready, we will speak to you again and as often as you need, to explain everything in more detail and answer any questions. Please be reassured that we will always have your baby's best interests at heart. We understand that your hopes and dreams for your baby are taken away in that instant.

Passing on the news to your family and friends may be very difficult. We will do our utmost to provide you with all the support you need.

Common Medications used in the Neonatal Unit

Most babies require medication during their admission and stay in the Neonatal Unit. The Neonatal Team will keep you updated on the medication that your baby is receiving. Here is a list of some of the more commonly used medication.

Vitamin K
We routinely give all babies Vitamin K following birth. Vitamin K is necessary for blood clotting and newborn babies don't have any stores of the vitamin. It is most effective when given as an injection into the muscle in the thigh.

Surfactant
We often give Surfactant (Curosurf) through the breathing tube. It helps to make breathing easier.

Antibiotics
These are used to treat infections or suspected infections. Antibiotics and indeed most other medicines are given in liquid form through the drip (intravenously) and are not painful.

Caffeine
Caffeine is used to help stimulate breathing. It is given intravenously or through the feeding tube.

Vitamins
Vitamins are often given to premature babies to help them grow and stay healthy.

Iron
Often premature babies need extra iron and this is given as an oral supplement.

Probiotics
We sometimes give Probiotics to our premature babies to help strengthen the gut and help prevent infections.

Diuretics
Diuretics are drugs that help get rid of any extra fluid around the lungs by increasing the production of urine. Examples of diuretics are Lasix (Frusemide), Chlorothiazide and Spironolactone.

Sodium Chloride
If the levels of sodium in the blood are too low, we will give replacement sodium chloride. This helps muscles and nerves to work properly.

Pain Relief
We use comfort techniques to help soothe baby's discomfort or anxiety. These include comfort holding, swaddling, using a soother and talking in a gentle voice. Sucrose can be placed in her cheek or on her tongue for procedures that are a little painful or upsetting. Should we anticipate greater discomfort, we regularly use medication such as Morphine and Paracetamol.

Sedation
We often give sedatives such as Morphine, Fentanyl or Midazolam to help keep babies calm if they are on the ventilator. This helps to keep baby and ventilator 'in sync' with each other and improve the effectiveness of the ventilator.

Discharge Planning

Preparing for Home

Throughout her stay in the unit, we will be preparing you for the day you take your baby home. The best way to prepare for home is to spend as much time as you can with her in the hospital. You will get to know her and feel comfortable and confident in caring for her.

She will be ready to go home when:

- She is at least 34 weeks gestation.
- She weighs at least 1.8kg.
- She is gaining weight.
- She is feeding well, either from the breast or bottle. She must have had no tube feeds in the previous 24-48 hours.
- She is keeping warm in a cot.
- She is free from bradycardias and desaturations for at least 5 days.
- She is off supplementary oxygen for at least 48 hours.
- She is off caffeine for 3 days or more.

If she is very premature, this usually will be around the date she was due to be born. Some babies go home earlier and some need to stay a little longer. We will teach you, her parents, about bathing, feeding, and all the things you need to know to look after her at home. We have a checklist that we use for each baby so, as far as possible, everything will be covered with you prior to discharge. The Discharge Planning Co-coordinator and the nurse taking care of her on a daily basis, will help you with getting organised for taking her home.

We aim to discharge our babies before 12 midday on a daily basis. This avoids rush hour traffic and gives you and your baby time to get settled at home before bedtime.

You may feel excited but also apprehensive at this time. You have grown used to having staff nearby to answer questions and give advice. At home, you will be the main person caring for your baby. Many parents are nervous taking their baby home, whether premature or full term. Remember, she is only going home because we believe that she is well enough to leave the hospital and that you are ready and able to care for her. At this stage, the best place for her is at home with you. Once home, your public health nurse, your GP and of course the hospital are only a phone call away.

Parent Education

Our discharge educational videos are available online at **www.rotunda.ie/parent-education/resources/.** Scroll down to the end of the page and you will see 'NICU Classes'. There are links to useful booklets and websites under the 'Important Documentation' tab. We encourage you to watch these videos, at least once, in the weeks and days leading up to your baby's discharge. Write down any questions you may have so that we can answer them the next time you are in with your baby.

Topics covered in the online videos are:

- The discharge criteria.
- The discharge process.
- A shopping list for going home.
- Breast feeding and expressing.
- Bottle feeding and sterilising.
- Safe Sleep.
- Safety at home.
- Bathing.
- The role of the Public Health Nurse.
- Tummy time.
- Vaccinations.
- Smoking.
- Hand Hygiene and Visitors.
- Follow-up Appointments.
- Signs of viral and bacterial infections.
- CPR (Cardio Pulmonary Resuscitation) and Choking.

Hearing Screening

Hearing screening will be done on the day of discharge. We will ask you for your consent prior to the screening. The test takes just a few minutes and is not uncomfortable or painful. It is usually done when she is asleep or settled. The results are available straight away. The test is done to check for congenital nerve deafness. A failed test in either or both ears does not necessarily mean your baby has a serious hearing loss but close follow up and more advanced screening may be necessary. If further follow up is required, the appointment will be posted out to you directly from the hearing screen department.

Feeding at home

Before your baby goes home, decide how you will feed her at home. Use the combination of expressed breast milk, formula, breast or bottle feeding that best suits you and your baby.

She should have a certain volume of feed in a 24 hour period. This is divided into a volume for each feed. Many babies have their own feeding patterns and may be hungrier at different times during the day. Therefore, don't worry if she takes less or more at some feeds as long as she takes her requirements over the 24 hours. You will get to know her pattern very quickly. The nurse will tell you how much she will need at each feed and how much for the whole day.

Fully breast feeding your premature baby is possible but can be a challenge prior to discharge. We recommend that you stay a day or two in the unit fully breast feeding to ensure all will go well at home.

Cleaning, Sterilising and Storing Feeding Bottles.

It is very important that you clean and sterilise all the equipment that you use to feed your baby, such as bottles, teats, lids etc. This removes any harmful bacteria that could grow in the milk and make her sick.

Cleaning

First wash your hands. Wash all the equipment in hot soapy water. Use a clean bottle brush and teat brush to wash the inside and outside of the bottles and teats. Rinse well in clean water. The dishwasher can be used to clean, not sterilise, feeding equipment. Be sure to follow manufacturer's guidelines.

Sterilising Methods.

Sterilise the clean bottles, teats and feeding utensils before you use them. This can be done by either:

- A steam steriliser, which can be either a plug-in one or one that can go in the microwave. Follow the manufacturer's instructions.
- Boiling in a saucepan for at least 3 minutes. Make sure everything is covered with water and there are no air bubbles.
- Chemical steriliser (such as Milton). Follow the instructions with the sterilising liquid.

Storing Sterilised Bottles

Wash your hands and clean work surfaces before opening the steriliser. Use the sterilised tongs or forceps to assemble the bottles and teats. Avoid touching the areas that will be in contact with the milk or the baby's mouth. If put together correctly, the bottles will remain sterilised for 24 hours if you don't open them.

How to Prepare a Bottle Feed.

- Boil fresh tap water in a kettle or covered saucepan.
- When boiled, leave to cool for 30 minutes. This makes sure the water is at the correct temperature.
- Clean work surfaces and wash and dry your hands.
- Carefully read the instructions on the formula's label to find out how much water and how much powder you need.
- Pour the amount of boiled water you need into a sterile bottle.
- Add the exact amount of formula you need to the boiled water. Use the scoop provided. Reseal the packaging.
- Screw the teat and lid on tightly and shake well to mix.
- Cool the bottle quickly.
- Check that the feed is not too hot. Shake the bottle and place a drop of milk on the inside of your wrist. It should feel lukewarm, not hot.
- Feed your baby.
- Throw away any feed that has not been taken after 2 hours.

It is safest to prepare a fresh bottle each time you need one, and to give it to your baby straight away.

How to warm up refrigerated bottle feeds.

- Remove the bottle of formula milk or EBM from the fridge just before you need it.
- Place it in a bowl of warm water, making sure the level of the water is below the neck of the bottle. You can also use a bottle-warmer.
- Warm for no more than 15 minutes.
- Check the temperature of the milk by dripping a few drops onto the inside of your wrist. It should feel lukewarm, not hot.
- Throw away any feed that has not been taken within two hours.
- Never use a microwave to re-warm feeds.
- **Please see the Safe food booklets from the HSE for further information.**

Home Environment

- Your home does not need to be as warm as the Neonatal Unit. Keep the room she is in between 18-20°C.
- Keep her away from open windows, draughts, fans, heaters and the fireplace.
- Don't use a hat indoors.
- Maintain a smoke free zone around her.
- Limit visitors and phone calls for the first few days or weeks.
- Try to limit how much she is handled by visitors.
- Don't expose her to visitors with cold or flu symptoms.
- Insist everyone washes their hands before touching her including family members and visitors.
- Clean toys and work surfaces regularly.
- Never leave her unattended on a changing unit or table.
- Always strap her into car seats, high chairs, bouncers etc.
- Every household should have a smoke alarm and carbon monoxide alarm.
- Chemical and medication presses should always have a lock on them.
- If you have any pets at home they should receive all of their vaccinations. Their feeding and litter areas should be kept away from the baby's food preparation and nursing areas. Always wash your hands after being with your animal and before handling your baby.

Items needed for Going Home

- Moses basket/next-to-me crib/cot.
- Pram or buggy.
- Car seat.
- Baby clothes including vests, babygros, cardigans, and a hat. Don't get a lot of the very small sizes as babies grow quickly.
- Baby linen including sheets, cellular blankets and towels.
- Nappies.
- Changing mat.
- Baby bath or basin.
- Axillary Thermometer.
- Sterilising Unit and Bottle brush.
- Bottles and teats. Speak to the nurse to see what teat your baby has been using in the unit. We would recommend getting two of the most similar bottles and teats for the first few days at home. Once she is feeding well at home, you can change to any bottle of your choice.
- Formula if formula feeding. Babies that are born before 34 weeks gestation are discharged home on a special formula for premature babies called Nutriprem 2. This can only be got in the pharmacy but you don't need a prescription. You may need to call in to your local pharmacy as it may need to be ordered in advance. This formula is usually used until 3 months corrected age depending on growth.
- Babies born less than 35 weeks gestation who are discharged home feeding on EBM may go home using Breast Milk Fortifier. You can get this in the pharmacy and do not need a prescription. You may need to let your local pharmacy know as it may need to be ordered in advance. The fortifier is usually continued for around one month post discharge. Speak to the doctor at the clinic appointments about discontinuing it. If you transition to breast feeding and stop expressing, the fortifier can be discontinued as long as she is gaining weight adequately (150-200gms a week).
- Home Medication and syringes for administration.
- On the day of discharge, bring in clothes, hat, blankets, car seat, apnoea monitor etc. Also bring in a freezer bag to take home any EBM you may have in the fridge or freezer.

Best Sleeping Position

- It is recommended that your baby sleeps in a cot or Moses basket in your room for the first 6 months of life.
- The best sleeping position for her is on her back. If she was in an incubator, she may have been placed on her tummy to help her with her breathing and digestion. Once she is moved from her incubator to a cot she is always placed on her back except in exceptional circumstances. Sleeping on her back does not increase the risk of choking or vomiting.
- She should always be placed on her back with her feet near the foot of the cot, Moses basket or pram.
- The covers should be tucked in loosely below her shoulders so that they cannot slip over her head.
- Change the position of her head each time you put her down to sleep. If she always lies with her head in the same position she might develop a 'flat-head'. This is known as positional plagiocephaly. If this does happen, it will disappear as she grows.
- Don't use a cot bumper, pillow, soft toys or duvet in her cot or Moses basket.
- Use 3-4 layers of cellular blankets and avoid fluffy blankets. If a blanket is folded over in two it is considered as two layers.
- When sleeping she can become too hot from too many blankets, clothes or because the room is too hot. If you are ever worried about her temperature, place your hand on her tummy or the back of her neck, which should feel warm but not hot. Her hands and feet normally feel cool but not cold. If you are still unsure, check her temperature using an axilla (under arm) thermometer. The normal axilla temperature is 36.5-37.5°C

According to HSE guidelines, don't fall asleep in bed with your baby if they are less than three months old, were born prematurely or had a low birth weight (less than 2.5kg or 5.5lbs when born). It is fine to take her into your bed for feeding or playing but she should be put back into her cot to sleep.

There are safe sleeping leaflets available in the unit and under the important documentation section of the online discharge videos.

Car Seat Safety

Your baby should be comfortable, secure and properly strapped into her car seat. The head support cushion is often necessary for small babies. The head and body should not slouch. The straps should come from above the shoulders, not be twisted and fit snugly. You should only be able to fit two fingers between the straps and the baby. Never use a padded coat or a snow suit in the car seat as she won't be strapped in tightly enough and she may also overheat.

Always use the car seat on every car journey no matter how short. The car seat should be rear facing and fitted correctly in your car. Your baby should be visible at all times either in the passenger seat or through the rear view mirror. Always turn off the passenger air bag if placing the car seat in the front. Having another adult supervise the baby in the rear seat is helpful. Never leave her alone in the car, not even for a few minutes.
If she is very premature, prior to discharge she will be assessed to see if she is ready for a car seat.

The Irish Road Safety Authority **www.rsa.ie** has lots of information about car seat safety.

Bathing your baby at home.

A bath two to three times a week is plenty. On the days that you do not bath your baby you can 'top and tail' by washing her face, the folds under the neck and arms and bottom.
Make sure the room is warm and that there are no open windows or any draughts.
Choose a quiet time when you are not too tired.
Don't be tempted to answer the phone.
Don't ever leave her alone in the bath not even for a second.
Don't leave an older brother or sister to watch over her in a bath.
Try not to bath her when she is really hungry or just after a feed.
The ideal time for the bath is when she is awake and content.

Get everything ready beforehand. You will need:

- A bath or basin.
- Towel.
- Vest and babygro or clothes.
- Clean nappy.
- Cotton pads.
- Nappy sack for the used cotton pads and wet nappy.
- Any products (keep products as natural as possible).
- Clean soother for afterwards (if used).

Put the cold water into the bath first, then the warm water. Fill the bath just high enough to cover her tummy. Four inches (10 cms) is usually enough. Spread the hot water around the bath evenly with your hand so that there are no hot spots. Use your elbow, not your hand, to check the water, it should feel nice and warm but not too hot. The bath water should be around 37 °C and you may like to use a bath thermometer to confirm this.

Take off her clothes but not her nappy and wrap her in a towel.

Clean her face and head first, before putting her into the bath. Always clean her eyes and face with clear water. Use a clean cotton pad for cleaning each eye. Clean from the nose outwards. Dry her eyes with a clean cotton pad. Clean the rest of her face, behind her ears and her neck. Dry them afterwards.

Now to wash her hair. Hold her in a 'rugby hold', supporting her head and body with your hand and arm. If you decide to use a shampoo, keep it mild and as natural as possible. Wash and rinse her hair. Dry it well with a towel to prevent too much heat escaping from her wet head.

Next take off her nappy. Place one hand under her shoulders and hold the arm that is farthest away from your body. This supports her head and shoulders. Place the other hand under the bottom and hold the thigh farthest away from your body. Now lower her slowly and gently into the bath. Continue to support her head and shoulders with one hand while washing the rest of the body. It is always clean from top to bottom, leaving the nappy area until last. Make sure to get in between all creases. Use a clean cotton pad for cleaning bottom and genitalia.

Make sure you use both hands to lift her out of the bath. Lay her flat on the towel, cover and dry her gently, paying special attention to dry all the creases.

This is a good time to massage your baby. Massage can help her to relax and sleep well. Avoid using any oils or lotions until she is at least a month old. Dress her with clean clothes.

Immunisations/Vaccinations

Vaccines are used to boost the immune system and produce antibodies to help the body fight off certain serious infections. They are a safe and effective way to protect your baby. Preterm babies need immunisation like all other babies. All immunisations are voluntary and your permission must be obtained. They are then carried out free of charge by your GP or public health nurse. You will be given a book on Childhood Immunisation which explains each vaccine and the timing schedule.

For vaccination purposes, the actual age of the baby is used, not the corrected age. The first vaccines are generally given two months after birth, even if a baby is premature. Babies that are still in hospital at two months of age will have their first vaccinations given here.

During the Winter/Spring months, many babies are at risk of getting bronchiolitis caused by the Respiratory Syncytial Virus (RSV). We may give Synagis to help protect the most vulnerable babies. Synagis is an artificial anti RSV antibody. It is given monthly, generally between October and March, by a nurse in your own home. A prescription will be send to you and you order the Synagis at your local pharmacy. Once collected, the medication must be kept in the fridge. A nurse from TPC will then contact you with a date and time to administer the injection.

The criteria for Synagis administration is any baby less than 29 weeks gestation, babies with Down Syndrome and a cardiac condition and any other baby where it is medically indicated.

More information on the childhood immunisation programme can be got at www.immunisation.ie

Apnoea Alarm

Some of our smaller babies may go home on an apnoea alarm, usually those that are born less than 1kg or if medically indicated. This will be arranged for you before your baby goes home. The apnoea alarm is normally continued for the first month at home. Her breathing is monitored and an alarm will sound if she stops breathing for 20 seconds or more. It is extremely sensitive. False alarms are common as the alarm may often be triggered when she is in a deep sleep and her breathing is shallow or if the probe becomes lose on her tummy. It is important to always check on her if the alarm sounds.

Home Oxygen

Sometimes, some of our extremely preterm babies will need oxygen going home. These are the babies that are still requiring oxygen past their due date and are otherwise ready for discharge. Home oxygen will be discussed with you in the lead up to discharge and will be arranged prior to going home. Babies on home oxygen also need an oxygen saturation monitor. You will be linked in with a social worker. Your baby will be followed up closely after going home. Sometimes, babies are admitted to CHI at Temple Street for weaning off their oxygen.

Home Medication

Many babies go home on medication. To be best prepared for giving medication at home, we recommend that you complete the Parent/Carer Medication Administration Competence Form. Please ask your nurse or neonatal pharmacist for more information. The nurse will show you how to administer the medication and you will then have the opportunity to give doses under supervision. This will increase your confidence with giving the medication and you will see how your baby prefers to take their medicine.

In some circumstances, it is necessary for the Rotunda Pharmacy to provide medication at discharge. You will often be given an initial short supply with future supplies to be obtained from your community pharmacy.

Please ensure that you are aware of all of the following information before taking your baby home.

- What the medication is called.
- What the medication is for.
- The dose (amount) to give and how to measure the dose.
- How to give the medication.
- How often you will need to give the medication.
- Any side effects to look out for.
- Where to store the medication.
- What to do if you forget to give a dose.
- If she needs more than one medication whether they can be given together or have to be given at different feeds.
- What to do if she vomits or spits out the medication.
- How and where to get future supplies.

For general information regarding medicines for infants and children, the Medicines for Children website **(https://www.medicinesforchildren.org.uk/)** is very useful.

Baby's Development

Normal development in babies varies a lot. Premature babies, because of their early birth, their stay in hospital and any ongoing medical issues may reach their milestones later than term babies. However, this gap narrows over time and most premature babies catch up with their term peers usually by the age of two years old.

Take an active role in helping her growth and development. Talk and play with her using her behaviours to guide you without overtiring her.
Tummy time is important for every baby's development. It helps to strengthen the muscles in her head, neck and back. Make sure she is awake and is never left alone on her tummy. It is recommended that she has tummy time about 3 times each day for 3 to 5 minutes at a time. This should slowly build up to longer sessions. On your chest or across your lap is considered tummy time for the first few weeks. Once she reaches term she can be put onto a hard surface for tummy time.

You and your baby may have met the physiotherapists in the unit. They will have shown you ways of helping your baby grow and develop and given you ideas to continue at home. They will continue to monitor your baby in the clinic to see how she grows and develops.

The role of the Public Health Nurse (PHN)

Once your baby has been discharged from the unit we will pass on your details to your local PHN. The PHN will contact you and arrange to visit your baby at home. This visit will normally take place within 48-72 hours of discharge. The PHN will arrange to carry out weight and development checks on your baby until school going age.

When first discharged we aim for 150-200grams of weight gain a week. Some weeks will be better than others. Your PHN will make sure your baby is growing adequately so don't worry. The local PHN and clinic will give you lots of information about local support groups and services such as breast feeding support, weaning classes etc.

How to recognise a sick baby at home

Some signs that your baby is unwell or becoming unwell are:

- Pale in colour.
- Rapid breathing or increased work of breathing.
- High or low temperature (36.5-37.5 is a normal temperature).
- Very sleepy, not waking up for feeds or falling asleep during feeds.
- Very irritable, high pitched cry and unable to settle.
- Having large vomits.
- Rash, either red or purple.

Always seek medical attention if you are worried about your baby.

Follow Up

When your baby goes home, you will be given appointments to return to the hospital at regular intervals. Some appointments such as weight checks and some examinations can be done by your public health nurse or GP. Some babies may also be followed up by the physiotherapist and dietitian in the outpatient department.

You may be given follow up appointments for CHI at Temple Street and/or CHI at Crumlin based on individual needs. **It is very important** that you keep these appointments.

Most appointments will be given to you prior to discharge. However, some may need to be posted out so please make sure that the correct address is on your baby's chart.

Feelings

While your baby was in the Neonatal Unit, you used a lot of energy just to keep going and stay strong. When you bring her home, the full impact of what has been happening over the last few days or months may suddenly catch up with you. You may feel very tearful or simply exhausted as your body starts to relax.

Different members of the family will have experienced the situation in very different ways. You all now have to adjust to the new situation. Newborn babies always take up a lot of their parents' time which can be hard on siblings. Try to understand how they might be feeling. Tell them what is happening and try to explain things honestly in an age appropriate way. Involve them in the care of the new baby. There are many ways even young children can help.

Staying positive, although often very hard, can be very valuable. Listening to each other and simply sharing your feelings can bring you closer together. Often there are no instant solutions so don't feel you need to come up with any.

There are many people you can talk to. Your public health nurse and GP are always available. There are many other services available and are listed at the back of the book.

End of Treatment Bell

Common Terms heard in the Neonatal Unit

Alveoli are tiny sacs in the lungs that move oxygen from the air into the blood.

Anaemia occurs when there are abnormally low levels of red blood cells or haemoglobin in the blood.

Apnoea occurs when a baby stops breathing for a period of 15-20 seconds or more.

Apnoea Alarm is an alarm that sounds if a baby has an apnoea. It can be on the vital signs monitor or a standalone monitor that records the apnoea only (MR10).

Bilirubin is formed when red blood cells are broken down and then processed by the liver. Excess bilirubin causes jaundice.

BiPaP or Bi-level Positive Airway Pressure delivers air and oxygen at a positive pressure into the lungs to support breathing. The pressures are slightly higher on inspiration and a specific rate is set.

Blood Culture is a blood test taken to see if and what organism may be causing an infection in the blood stream.

Blood Gas is a measurement of oxygen and carbon dioxide in the blood. It is used to regulate the amount of ventilation and oxygen the baby needs.

Bradycardia refers to a temporary decrease in heart rate.

Breast Milk Fortifier (BMF) is an additive which provides extra calories and nutrients and is added to expressed breast milk.

Broncho-Pulmonary Dysplasia (BPD) is a lung condition that occurs in some premature infants who have been mechanically ventilated, required CPAP and/or received oxygen for the treatment of RDS.

Cannula is used to administer fluids into a vein.

Cerebral Function Monitoring (CFM) measures background activity of the brain.

Comfort Holding is a form of positive touch.

Continuous Nasogastric Feeding (CNGF) is a method of feeding small babies small amounts of milk slowly, through their nasogastric tube.

Continuous Positive Airways Pressure (CPAP) delivers air and oxygen at a positive pressure into the lungs to support breathing.

CT scan is a detailed scan of the brain or other parts of the body.

Cyanosis is a bluish colour of the baby's lips and skin caused by not enough oxygen.

Desaturation refers to the temporary drop in the oxygen levels in the blood.

Donor EBM (DEBM) is breast milk donated from another mother. It is tested and pasteurised before use.

EBM is expressed breast milk.

ECG measures the electrical activity of the heart.

ECHO is a special ultrasound of the heart.

EEG measures the electrical impulses of the brain.

Endotracheal Tube (ET) is a soft plastic tube that is passed through the baby's mouth or nose and into the windpipe to allow the use of a ventilator.

Enteral Feeding is milk feeds either by mouth or by tube.

Extubation is the removal of the ET tube.

Fortified EBM (FEBM) is breast milk fortified with "breast milk fortifier".

Gestational Age is the maturity of the baby, which is the number of weeks of pregnancy.

Gram is a unit of weight. A kilogram equals 1,000 grams which is 2.3 pounds.

Heel prick is a method of getting a tiny blood sample from the heel for testing.

High Flow Nasal Cannula (HFNC) is a means of giving air and oxygen into the lungs to support breathing.

Humidity is adding moisture either in an incubator or in the breathing circuit.

Incubator creates a stable warm environment and allows close observation of each baby.

Infusion Pump is used to control the rate that fluids, medications and feeds are given.

Intravenous (IV) means into a vein. This can be either drugs or fluids.

Intraventricular Haemorrhage (IVH) is a bleed into the brain and/or the surrounding tissues of the brain.

Jaundice is the yellowish discolouration of the skin and eyes caused by excess bilirubin.

Kangaroo Care is skin-to-skin contact between baby and parent.

Low Birth Weight Formula is a special formula with extra calories and nutrients for premature babies.

Lumbar Puncture is the procedure whereby a small sample of cerebrospinal fluid is taken through the spine to check for infection.

Meconium is the normal first stool passed by all babies, usually following delivery. It is thick, sticky and dark green in colour. It is composed of amniotic fluid and cells.

Meconium Aspiration Syndrome is a lung condition caused by aspiration of meconium before birth.

Monitors are machines that record vital signs including heart rate, respirations, oxygen saturation, blood pressure and temperature etc.

MRI is a scan which gives a very detailed picture of certain areas of the body.

Nasogastric tube (NGT) is a tube passed through the nose and into the stomach. It can be used for feeding and/or for giving medications.

Necrotising Enterocolitis (NEC) is an inflammatory bowel condition affecting some premature and newborn infants.

Neonatal Encephalopathy (NE) is a brain injury that occurs as a result of reduced oxygen supply to the brain.

Newborn Bloodspot Screening (Heel Prick) is a blood test taken to test for some metabolic disorders, Cystic Fibrosis and thyroid function problems. It is taken between day 3 and day 5 of life.

Nil Per Orally (NPO) is nothing by mouth/orally.

Non-Nutritive Sucking (NNS) is sucking for pleasure rather than for food.

Occipital Frontal Circumference (OFC) or Head Circumference is the baby's head measurement.

Orogastric tube (OGT) is a tube passed through the mouth and into the stomach. It can be used for feeding and/or for giving medications.

Oxygen is a gas we breathe. In room air, the concentration of oxygen is 21%. Babies can receive additional oxygen up to 100%.

Parenteral Nutrition (PN) is an intravenous fluid which contains carbohydrates, proteins, fats and the essential nutrients for growth and development.

Patent Ductus Arteriosus (PDA) occurs when a small blood vessel remains open between the blood vessel supplying the lungs and the blood vessel supplying the rest of the body.

Per Orally (PO) is via the mouth/orally.

Percutaneously Inserted Central Catheter (PICC) is an intravenous line inserted into a deep vein and may be used for many days or weeks.

Persistent Pulmonary Hypertension of the Newborn (PPHN) occurs when a newborn's circulatory system does not adapt to breathing outside the womb.

Phototherapy is the use of special lights to treat jaundice.

Pneumothorax (collapsed lung) occurs when air leaks into the space surrounding the lung.

Premature means a baby born before 37 weeks of pregnancy.

Respiratory Distress is difficulty in breathing.

Respiratory Distress Syndrome is a lung condition common to premature babies due to immature lungs and a lack of surfactant.

Respiratory Syncytial Virus (RSV) is a virus that may cause bronchiolitis.

Retinopathy of Prematurity (ROP) is a condition that may occur in the eyes of premature infants.

Retraction is the pulling in of the skin and muscles between the ribs or just below the rib cage during laboured breathing.

Room Air is the air we breathe and of which 21% is oxygen.

Tachycardia is a fast heart rate.

Tachypnoea is a fast breathing rate.

Term Baby is a baby born between 37 and 42 weeks of pregnancy.

Total Body Cooling is where the baby's temperature is lowered to 33.5°C.

Trachea (windpipe) connects the lungs with the mouth and nose.

Ultrasound Scan uses sound waves to scan baby's head and other internal organs.

Umbilical Arterial Catheter (UAC) is a line inserted into the baby's umbilical artery through the 'belly button'. It is used for taking blood samples and monitoring blood pressure.

Umbilical Venous Catheter (UVC) is a line placed into the baby's umbilical vein through the 'belly button'. It is used for infusions and drugs.

Ventilator is the machine used to help breathing.

Address:
Rotunda Hospital
Parnell Square
Dublin 1
D01 P5W9

Web: www.rotunda.ie
Tel: 01 817 1700

Neonatal Unit	01 873 3377
Intensive Care	01 817 6805
HDU (High Dependency) 10 Bed	01 817 6814
SPC (Special Care) 8 Bed	01 817 6804
Special Care Wing	01 817 6815
Wing 4 Bed.	01 817 2562

The Rotunda Foundation
www.rotundafoundation.ie

More Useful Contacts and Information

Children's Health Ireland at Crumlin
Crumlin
Dublin 12
Tel: 01-4096100
www.olchc.ie

Children's Health Ireland at Temple Street
Temple Street
Dublin 1
Tel: 01-8784200
www.cuh.ie

Children's Health Ireland at Tallaght
Tallaght
Dublin 24
Tel: 01-4142000
www.tuh.ie

Health Service Executive
www.hse.ie
www.mychild.ie
www.undertheweather.ie

HSE breastfeeding support network
www.breastfeeding.ie

Childhood immunisation programme
www.immunisation.ie

Health Promotion
www.healthpromotion.ie

Irish Neonatal Health Alliance
www.inha.ie

Parentline
www.parentline.ie

Cuidiú -Irish Childbirth Trust
www.cuidiu.ie

La Leche League Ireland (LLL)
www.lalecheleagueireland.com

Irish Multiple Birth Association (IMBA)
www.imba.ie

Car seat safety
www.rsa.ie

Tusla Child and Family Agency
www.tusla.ie

Irish Nutrition and Dietetic Institute (INDI)
www.indi.ie

Irish Society of Chartered Physiotherapists (ISCP)
www.iscp.ie

Bliss
www.bliss.org.uk

Early Babies
www.earlybabies.com

European Foundation for the Care of Newborn Infants (EFCNI)
www.efcni.org

Tinylife
www.tinylife.org.uk

A Little Lifetime Foundation
www.alittlelifetime.ie

First Light
www.firstlight.ie

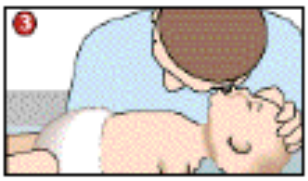
Weight Conversion Chart

kg	lb oz	kg	lb oz	kg	lb oz	kg	lb oz	kg	lb oz
0.45	1 0	1.36	3 0	2.27	5 0	3.18	7 0	4.08	9 0
0.48	1 1	1.39	3 1	2.3	5 1	3.2	7 1	4.11	9 1
0.51	1 2	1.42	3 2	2.33	5 2	3.23	7 2	4.14	9 2
0.54	1 3	1.45	3 3	2.35	5 3	3.26	7 3	4.17	9 3
0.57	1 4	1.47	3 4	2.38	5 4	3.29	7 4	4.2	9 4
0.60	1 5	1.50	3 5	2.41	5 5	3.32	7 5	4.22	9 5
0.62	1 6	1.53	3 6	2.44	5 6	3.35	7 6	4.25	9 6
0.65	1 7	1.56	3 7	2.47	5 7	3.37	7 7	4.28	9 7
0.68	1 8	1.59	3 8	2.5	5 8	3.4	7 8	4.31	9 8
0.71	1 9	1.62	3 9	2.52	5 9	3.43	7 9	4.34	9 9
0.74	1 10	1.64	3 10	2.55	5 10	3.46	7 10	4.37	9 10
0.77	1 11	1.67	3 11	2.58	5 11	3.49	7 11	4.39	9 11
0.79	1 12	1.7	3 12	2.61	5 12	3.52	7 12	4.42	9 12
0.82	1 13	1.73	3 13	2.64	5 13	3.54	7 13	4.45	9 13
0.85	1 14	1.76	3 14	2.67	5 14	3.57	7 14	4.48	9 14
0.88	1 15	1.79	3 15	2.69	5 15	3.6	7 15	4.51	9 15
0.91	2 0	1.81	4 0	2.72	6 0	3.63	8 0	4.54	10 0
0.94	2 1	1.84	4 1	2.75	6 1	3.66	8 1	4.56	10 1
0.96	2 2	1.87	4 2	2.78	6 2	3.69	8 2	4.59	10 2
0.99	2 3	1.9	4 3	2.81	6 3	3.71	8 3	4.62	10 3
1.02	2 4	1.93	4 4	2.84	6 4	3.74	8 4	4.65	10 4
1.05	2 5	1.96	4 5	2.86	6 5	3.77	8 5	4.68	10 5
1.08	2 6	1.98	4 6	2.89	6 6	3.8	8 6	4.71	10 6
1.11	2 7	2.01	4 7	2.92	6 7	3.83	8 7	4.73	10 7
1.13	2 8	2.04	4 8	2.95	6 8	3.86	8 8	4.76	10 8
1.16	2 9	2.07	4 9	2.98	6 9	3.88	8 9	4.79	10 9
1.19	2 10	2.10	4 10	3.01	6 10	3.91	8 10	4.82	10 10
1.22	2 11	2.13	4 11	3.03	6 11	3.94	8 11	4.85	10 11
1.25	2 12	2.16	4 12	3.06	6 12	3.97	8 12	4.88	10 12
1.28	2 13	2.18	4 13	3.09	6 13	4.0	8 13	4.9	10 13
1.30	2 14	2.21	4 14	3.12	6 14	4.03	8 14	4.93	10 14
1.33	2 15	2.24	4 15	3.15	6 15	4.05	8 15	4.96	10 15

Infant Resuscitation

1. Shout and Tap

Shout your baby's name and gently tap him/her on the shoulder.
If there is no response, position your baby on his/her back.



2. Check Breathing

Look for chest movement, listen for sounds of breathing and feel for breath on your cheek. Do this for no more than 10 seconds. If he/she is not breathing (or only gasping) start chest compressions

3. Give 30 Chest Compressions

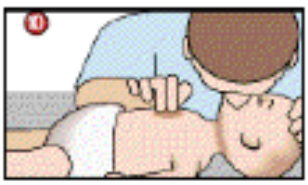
Give **30 chest compressions** at the rate of 120 / minute. "Push fast"
Use 2 fingers in the centre of the chest just below the nipples. Press down approximately $^{1}/_{3}$ (1.5 inches/4cms) the depth of the chest "Push hard". Allow the chest to recoil completely between compressions.

4. Open the Airway

After 30 compressions open the airway using a head tilt lifting of the chin. Clear the mouth of mucous/milk, if visible. Do not tilt the head too far back

5. Give 2 Breaths

If he/she is not breathing give **2 breaths**. Cover your baby's mouth and nose with your mouth. Each breath should be 1 second long. You should see the baby's chest rise with each breath.



6. Repeat 30:2 breaths for 2 minutes

Repeat with 30 compressions followed by 2 breaths (**30:2**) for 2 minutes (approximately 5 cycles) before calling 999. Continue giving compressions and breaths while awaiting help.

American Heart Association Guideline for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care 2015.

Acknowledgement

This book was compiled by the multidisciplinary team of the Neonatal Unit. We would like to thank everyone for their help and contributions. We especially would like to thank all the babies and parents who featured in this book. We hope that the book will help you during your baby's stay with us.

Many thanks

Helen

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