

From Surviving to Thriving

ORAL FEEDING SUCCESS ON THE NEONATAL UNIT AND BEYOND



In association with

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Irish
**Neonatal
Health**
Alliance

Congratulations on the birth of your baby!

Having your baby admitted to the Neonatal Unit can be a worrying time and learning to care for your baby in an unfamiliar environment can be challenging. One of the key things you and your baby will learn to do together on the Neonatal Unit is learn how to feed orally.

This booklet has been created to help you to understand how your baby's feeding skills develop, how prematurity can impact on feeding abilities and what you can do to help your baby be a safe and efficient oral feeder in the neonatal unit and after their discharge home.

For babies born prematurely, learning to feed orally can take time. Typically, premature infants require more time than more mature infants to become full oral feeders ^(1,2). Oral feeding is a complicated process which requires the consistent co-ordination of sucking, swallowing and breathing to achieve success.

From the moment your baby is born, the professionals caring for them will be carefully calculating their nutritional needs to help keep them healthy and support them to grow. This can happen in a number of different ways depending on your baby's gestation at their birth. Ultimately the aim will be to support them to receive their nutrition orally through breastfeeding or bottle feeding.

Caitriona Heffernan
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*"Every experience matters in the Neonatal Unit,
especially every feeding experience."*

Catherine S. Shaker M.S., CCC-SLP ⁽³⁾

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How does Oral Feeding and Swallowing work?

For most of us eating and drinking is something we do every day without really thinking about the skills that are involved. Eating and drinking is a complicated process which relies on co-ordination, efficiency and stamina to achieve success.

There are 4 main stages involved in the activity of oral feeding and they are the same regardless of whether you choose to breastfeed or bottle feed your baby.

Stage 1 - Getting Ready

Babies are at their most ready to feed when they are awake and alert. Research has shown that being alert before and during an oral feed is positively related with success at oral feeding attempts. ^(1, 22)

Stage 2 - The Oral (mouth) Stage

Once the baby latches on to the nipple or teat, their lips should form a full seal around the areola or base of the teat and the tongue will cup around the nipple or teat. Sucking is a carefully co-ordinated partnership of suction (provided by the tongue moving forward and backwards in the straight line) and compression (provided by the jaw moving up and down in straight lines). By combining these actions repeatedly, the baby draws milk from the teat or nipple and transports it to the back of the mouth for delivery to the pharynx (throat).

Stage 3 - The Swallowing Stage

As soon as fluid moves over the back of the baby's tongue, signals from their brain put in motion a series of safety measures to protect the airway while the food passes through the pharynx (throat) and into the food pipe.

The size and structure of an infant's pharynx allows natural protection for their airway during the swallow and allows them to breath and drink at the same time ⁽⁴⁾. While swallowing, the baby should temporarily pause their breathing and block the entrance to their airway with their vocal cords. By doing this fluid is prevented from entering the airway. Once the swallow has taken place, the baby breathes out as a final safety measure to blow any traces of fluid that might be left behind near their airway ⁽⁵⁾. When you consider how many times this happens in a single feed, it becomes clear why feeding is a complicated process.

Stage 4 - The Food Transit Stage

Once the fluid moves safely into the food pipe it is pushed downwards into the stomach and is broken down by natural acids. From there it moves into the gut where nutrition is absorbed and on to the intestines for the body to turn it into waste product.

Did you know?

A newborn's anatomy (the way that their body parts are made up) gives a natural protection to their airway during oral feeding. The smaller space available in the newborn's pharynx (throat) naturally protects the airway from fluid entry during the swallow.

The food pipe is closed unless you are in the process of swallowing food or fluid while your breathing pipe is held open at all times by small rings of cartilage. This is why fluid can easily enter the airway if the swallow is not coordinated well.

How does Prematurity affect Oral Feeding Success?

Stage 1 - Getting Ready

Infants born prematurely need a lot of sleep. As a result, they often have only a short window of opportunity to use their energy for feeding. In the early day or weeks, this may limit the number of times in any 24 hour period when your baby is alert enough to feed or how long they can sustain the activity of sucking during an individual feed.

Additionally, very small or fragile babies can find the process of being moved for a feed very challenging. They can sometimes use all their available energy 'organising' themselves and getting used to a different temperature, different light level and a different position outside of their cot or incubator. As a result it is common for very small infants to have 'used up' all their energy getting ready for the feed only to fall asleep before the feed has even started. Ideally, you should avoid feeding your baby if they are sleepy ⁽⁶⁾ or are resisting opening their mouth. Wait for another time to try again. Being responsive to your baby's cues is extremely important and we will discuss this in greater detail later in this booklet.

Stage 2 - The Oral Stage

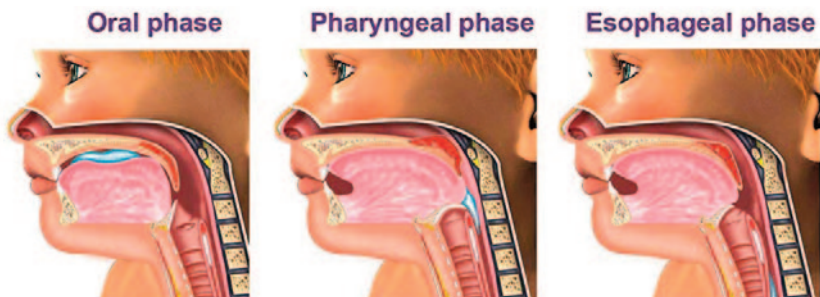
Research shows that although babies show an ability to suck non-nutritively on a soother or empty breast as early as 28 weeks gestation ⁽⁷⁾. Sucking strength and efficiency is limited when an infant is born pre-term ⁽⁸⁾. As a result, pre-term babies rarely possess enough stamina to sustain sucking action for prolonged periods in the early days or sometimes weeks ⁽⁹⁾. Their strength and efficiency increases as the baby's age increases and so time is an important factor in oral feeding development ^(10, 5).

Stage 3 - The Swallowing Stage

The neonate is actually very well designed to protect their own airway when feeding. Their pharynx (throat) is structured so that fluid is directed away from the airway during the swallow ⁽¹¹⁾. However, the research also shows that premature infants often mis-time or over-ride their need to breathe during the suck-swallow-breathe process resulting in potential for liquid to enter the airway ^(12, 5).

Stage 4 - The Food Transit Stage

Research shows that premature infants have immature muscles helping the food to move through the food pipe and stay contained within the stomach. Additionally, their gut is immature. As a result, babies born prematurely are prone to gastroesophageal reflux and other gastrointestinal issues ⁽¹³⁾.



How can I help my baby Feed Safely and Efficiently?

The most important skill you can develop to help your baby learn to feed safely and efficiently is to learn how to read your baby's cues.

Just because they cannot talk, we shouldn't underestimate the baby's ability to communicate clearly with us. You may have already noticed how your baby responds to different experiences they encounter on the neonatal unit. Perhaps they become distressed in a particular position in their incubator or cot? Maybe you've found that they are more settled when they are held in certain way? These little communication efforts from your baby can be considered **'stop'** and **'go'** signs - an indication from your baby that they do, or do not, like something.

You may already have an instinct about your baby's likes and dislikes because you are already tuned in to their cues. If you feel like you're not sure about your baby's cues or how they communicate stress and comfort, then spend some time simply observing them and taking note of how they respond to being moved, being exposed to light, having their nappy changed, sucking on their dummy, feeding etc. There is a section at the back of this booklet where you can record what you believe to be your baby's **'likes'** and **'dislikes'**. These may seem like insignificant observations but learning how your baby communicates with you in their very earliest days is the most important skill you can have as your baby's feeding partner.

The idea of a feeding partnership is very important. In a breastfeeding relationship the partnership is automatically built into the process as the baby receiving milk flow depends on them actively sucking at the breast. In a bottle feeding relationship we need to focus a little more on ensuring that we are responsive to the baby's cues as we are in control of the liquid flow when we place the upturned bottle in the baby's mouth. It is important that we learn the baby's communication cues for feeding so that we will know when to stop a feed or when it is ok to proceed. This is not simply a 'gentle' way to approach feeding babies but is considered best practice. Current approaches to oral feeding practice on the neonatal unit are moving away from focusing on the 'amount' the baby can drink at an individual feed and towards ensuring a 'responsive feeding' approach. A **'responsive feed'** is one where the baby 'leads' the feed and the feeder responds and reacts to the cues of the baby. This method allows the baby to progress at their own rate towards the attainment of full oral feeds. ^(3, 14, 15).



The journey to Oral Feeding with your baby

The staff on your neonatal unit will work with you to help determine what stage your baby is at and what they are ready for in terms of pre-feeding preparation or access to oral feeding.

Even if your baby is not yet ready to orally feed there is plenty of opportunity for them to develop essential experiences and skills for later feeding success through pre-feeding preparation. Depending on your baby's gestation when they are born you may work through all, or just some of the steps below. Each hospital will have a different policy on access to pre-feeding skills development and oral feeding. Ask the staff looking after your baby what the policy is in your hospital.

The 4 steps to Oral Feeding Readiness - pre-feeding skills development

- 1 Start Early:** If your baby is born very prematurely, feeding preparation will ideally start long before your baby has their first oral 'feed'. Pre-feeding skills are developed through opportunities to be held, to suck, to taste and experience the different parts of the feeding process in a gentle way and with no expectation of drinking. Early exposures can include kangaroo care, being exposed to the smell of breastmilk, accepting tiny tastes of colostrum and milk. Even positive experiences of being carefully handled and cuddled help to prepare for later oral feeding success ^(16, 17, 18).
- 2 Start with a Pumped Breast:** If your baby is not yet ready to start oral feeding, you could consider allowing your baby access to a pumped breast. This is a very gentle way of allowing the baby their first experience of 'feeding' without the pressure to manage liquid flowing into their mouth. When a baby is fed by bottle, the action of reclining the baby and turning the bottle upside-down results in milk flowing into the baby's mouth by gravity. Regardless of the baby's level of skill or their readiness to feed, they are required to try their best to manage the milk flowing into their mouth. When a baby is offered the pumped breast, they must show interest and actively latch and suck before they will receive any milk ^(19, 5). Offering a pumped breast limits the amount of fluid the baby will receive even if they are actively engaged in sucking. This is the safest and most comfortable approach for your baby as they determine their milk intake rather than us.
- 3 Non-nutritive Sucking:** There is lots of evidence to support the notion that access to non-nutritive sucking (sucking on a dummy, empty breast or gloved finger) gives babies practice at sucking and swallowing (their own saliva) and actually helps them to transition from tube feeding to oral feeding ^(20, 21).

Non-nutritive sucking is something you can do with your baby but can also be done by the staff looking after your baby when you are unavailable. While your baby's nutritional needs are being supported by tube feeding, non-nutritive sucking during tube feeds allows your baby the early experience of associating sucking with the feeling of their tummy getting full.



- 4 **Consider dummy or finger dips:** Offering your baby a dummy or gloved finger dipped in breastmilk or formula is another way of offering an early positive oral experiences to your baby without the expectation of tolerating any volume of milk. Dummy dips allow the baby to practice their sucking and also to experience their first tastes of milk ⁽¹⁸⁾.

When you do move on to offering your baby attempts at oral feeding, it is useful to remember the following -

The 3 'Golden Rules' of Oral Feeding:

- 1 **Manage your expectations:** Once you start to offer oral feeds to your baby with the expectation that they will drink, it is best not to have high expectations of how much the baby should drink. It is inevitable that as your baby establishes their feeding skills they will have **'up days'** and **'down days'**. A premature infant will sometimes have to undergo tests and procedures that can be challenging for them e.g. blood testing, eye tests, insertion of NG tubes etc. Though necessary for their wellbeing, these procedures can result in your baby being particularly sleepy or unstable for some time after. This can interfere with their ability to feed orally. Additionally, as babies grow, their nutritional needs increase and they require a higher volume of food. A baby who was managing 30mls of milk by bottle or who was meeting their requirement by breast may be operating at the limit of their current ability and any increase in volume requirements may result in 'stop signs' emerging in their feeds. Be reassured that this is a common issue for infants as they progress with their oral feeding and it is essential that we move at their pace. Offering babies opportunities to feed at their pace is the safest and most comfortable way to establish oral feeding. This is called **'Infant driven feeding'** or **'Responsive Feeding'**.
- 2 **Look for interest and engagement from your baby:** It is very important that your baby appears actively interested in the feeding process. By waiting for the baby to appear interested in the feed it is more likely that they will be well coordinated and stable throughout the feed ⁽²²⁾. Though it can be tempting to encourage your baby to suck by moving the teat or nipple around in their mouth, over use of this technique is not recommended. Sucking is a reflex for the newborn infant and so they will suck if stimulated even if they are not ready to feed. As we learned earlier in this booklet, feeding is not simply limited to sucking behaviour so we should always be mindful of the complex task required of the infant once milk is delivered into their mouths. Only by ensuring that the baby is actively engaged in the feeding task can we avoid placing increased strain on the co-ordination of their swallowing and breathing abilities ⁽²³⁾.



3 Watch your baby for 'stop' and 'go' signs: These are the signs that indicate that your baby is happy to proceed with the feed **or** is signalling to you to pause or stop.



'Go signs' include:

- Being awake and alert prior to the feed
- Rooting
- Actively sucking on dummy
- Actively sucking on the bottle/breast
- Maintaining an 'alert' state (awake and calm) during the feed
- Showing a steady suck, swallow and breathe rhythm
- 'Self pacing' - pausing independently for breathing breaks
- Only requiring brief pauses/rest breaks during the feed
- Maintaining their normal colour
- Maintaining their oxygen saturations (oxygen readings)

'Stop signs' include:

- Being in a sleepy state or suddenly becoming sleepy on presentation of the bottle/breast
- Becoming fatigued or sleepy during the feed
- Becoming limp or floppy (particularly around the lower face)
- Not opening of the mouth or fighting the bottle/breast
- No observable effort to suck at the breast/bottle
- Arching or turning away from the bottle
- Gagging, coughing, colour changing, desaturating (low oxygen levels), or significantly increased or decreased heart rate (your medical team will be able to tell you what is 'significant' for your baby)

(Shaker, C, 2017)



What should I do if my baby shows 'stop signs' during feeding attempts?

As we've talked about earlier in this booklet, supporting your baby to be awake, alert, and engaged in feeding is essential for true feeding success. If your baby is presenting with some 'stop signs' during feeding, there are some supports you can offer them to allow them to feel more stable for the feed. If the supports listed below do not have a positive effect on your baby's stability, then you should stop the feed and try at another time. Offering them one of the supportive 'pre-feeding' experiences listed earlier in the booklet may also be an option.

- 1 Offer non-nutritive sucking:** Some studies show that offering non-nutritive sucking opportunities and gentle oral stimulation to an infant can have a positive impact on their level of alertness for the feed ⁽²⁴⁾ and also help them to become more stable for the feeding task ⁽²⁵⁾. Research shows that the baby's ability to remain awake and alert during non-nutritive sucking before feeds is a good indicator feeding success ⁽²³⁾.
- 2 Consider positioning:** Some research suggests that 'elevated side lying position' is a very supportive position in which to feed a pre-term baby who has on-going breathing issues. This involves laying the baby on a supportive pillow on their side with their heads elevated higher than their hips for their feed. Babies fed in this position have been found to have more stable heart rates and breathing rates during oral feeding allowing them to achieve better overall stability during the task of feeding ⁽²⁶⁾.
- 3 Consider swaddling:** Swaddling is the practice of wrapping an infant in sheets of cloth or a blanket. Some research shows that swaddling can have a stabilising effect on the infant by helping to maintain an ideal heart rate and helping the baby's body to feel 'organised' in their environment ⁽²⁷⁾. It is thought that the act of swaddling can help to replicate the feeling of being in the womb where the baby's body was contained within the uterine sac. Swaddling can help to keep the baby in the calm but alert state that is ideal for oral feeding attempts. Staff on the neonatal unit are very experienced in swaddling babies and will help you to learn this skill.

Note: Some babies find being contained to be a stressful experience. Your baby should be allowed to lead the way on using this strategy, observe them to assess their reaction to being swaddled.



- 4 Choose the most supportive equipment:** If you are feeding your baby by bottle there will be a number of different types of teats available in your neonatal unit. It is fine to try different teats with your baby to see what suits them best with some but try not to change the teat frequently. Frequent teat changes can be a confusing experience for the baby as they try to learn to feed and makes it difficult for you truly assess the success of a particular type of teat.

If your baby has a weak or 'slow' suck it can sometimes be tempting to choose a faster flowing teat to help them receive more milk. However, we should always be cautious that a faster flowing teat can also overwhelm a small or fragile baby ⁽²⁸⁾. The best method of finding the right flow teat is to monitor the baby's reaction to the feed. If they remain in a comfortable and 'alert' state throughout the feed then it is likely you have made a good choice. If they seem distressed, uncomfortable, loose liquid from the side of their mouth or experience repeated drops in their oxygen saturations then there may be a more suitable teat available for them. It is also worth remembering when you choose a teat type for your baby that the manufacturing standard can be variable. For example, teats that are both labelled 'slow flow' can actually have very different flow rates in testing ⁽²⁹⁾. This is another reason why watching your baby's behaviours during bottle feeding is the best way of truly monitoring their performance in bottle feeding.

For the breastfed baby, nipple shields can be used as an assistance tool in establishing an early latch for your baby ⁽⁵⁾. You should talk to your feeding support team about the best choice for you and your breastfed baby.

- 5 Use 'Pacing':** Premature babies can easily get overwhelmed by sucking and swallowing during bottle feeding and can forget to take a pause and breathe. Research show us that premature babies will often continue to suck even when they need a breathing break or will take a breath at the wrong time in the suck-swallow-breathe cycle ⁽⁵⁾. Watch your baby closely. If you notice that they are very interested in sucking but become distressed during the feed then they may be having difficulty coordinating their sucking, swallowing and breathing. Some signs of distress can include oxygen desaturations (having low oxygen readings), looking 'panicked' with wide eyes or showing added body movements through waving their arms or stretching their body. Paced feeding encourages pauses between sucking bursts that are controlled by the parent or caregiver. It involves removing or lowering the bottle after 3-5 sucks so that the baby can take a breathing break. This method is intended to prevent desaturations (low oxygen levels) and keep the baby stable throughout the feed ⁽²⁸⁾.



Responsive, Cue-Based Oral Feeding as the key to feeding success

If you consider your own experience of learning a new skill, no doubt there are a few qualities you would like in your teacher or learning partner.

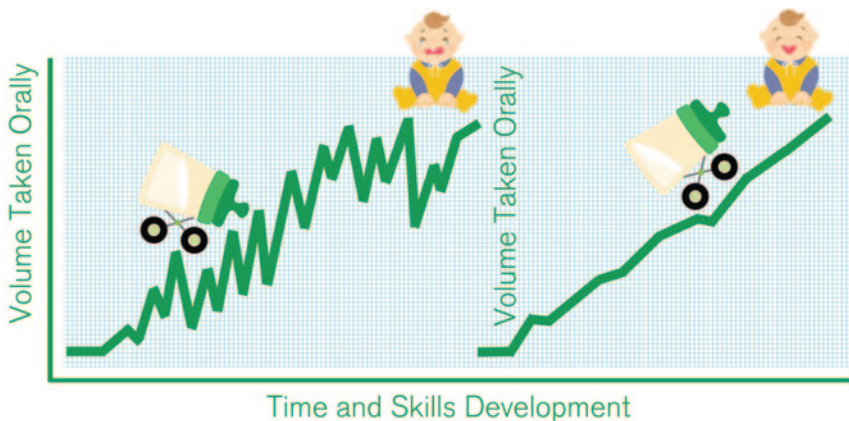
For example, when learning to drive a car, most people would prefer a teacher who checks their level of skill and knowledge before they start, checks that they are ready before asking them to drive out onto the road, has realistic expectations of how they will progress from lesson to lesson, moves at a slow pace through the different stages and gives them plenty of opportunity to practice before expecting them to drive on the motorway!

Learning to feed orally can be a similar experience for your baby. The process of learning can take more or less time depending on your baby's gestational age and any medical complications they may be experiencing. One thing is certain - babies need a supportive partner to guide them through learning this essential skill.

You will notice that two of the three **'Golden Rules'** for successful oral feeding outlined in the previous section are around following your baby's signals about how they are experiencing the feed and about managing our expectations of 'how much' we want the baby to feed. It focuses on us being teachers but more importantly partners for our babies.

We know that all parents are eager to take their baby home and establishing full oral feeding is an essential part of that goal. Though it is completely understandable that we would be tempted to encourage the baby to take as much fluid as possible at each feeding opportunity by waking them and stimulating them during the feed to keep them actively sucking, research shows that this approach may not help them to reach full oral feeding any sooner. The evidence shows that following the baby's lead, being responsive to their cues, discontinuing feeds when 'stop' signs are clear and offering tastes rather than 'feeds' in the early stage of the feeding journey can actually help them to transition earlier to oral feeding⁽¹⁴⁾. Additionally, it does not result in the baby staying in hospital longer. In fact, in some cases this supportive and responsive approach to feeding development has led to earlier discharge for the babies involved⁽¹⁵⁾.

Ideally, if we were to plot a baby's supported journey to full oral feeding on a graph it should show a slow but steady upward incline relating to skills development and volume. This indicates a baby who is offered oral feeds with a very slow progression of volume, energy and skill demands over time. We should try to avoid a feeding journey that is inconsistent and very variable from day to day. Premature babies develop all their skills slowly and gradually (with occasional dips or set-backs) and so feeding skill development should mirror this.



Feeding after discharge and into Early Childhood

Research tells us that some babies born prematurely can continue to experience difficulties with oral feeding following their neonatal period ⁽³⁰⁾.

In some research, up to 1/3 of premature infants (born less than 34 weeks gestation) are reported to have feeding problems during their first year ⁽³¹⁾. In other studies, up to 80% of preterm newborns experience persistent feeding issues after discharge. Some problems can include; delayed feeding skill development, difficulty ensuring adequate intake, difficulties achieving weight gain, excessive duration of feeds, difficulty with the transition to solid foods ^(32, 33, 3). Additionally, parents report significant stress around managing feeding issues independently at home ^(34, 3). As the infant grows, they can be prone to some oral hypersensitivity and other sensory issues around food ⁽³²⁾.

This information is not reassuring to parents of premature infants, but it is important to note that there is support available to help you navigate your child's feeding development after their time on the neonatal unit. If you experience any of the feeding challenges outlined above following your discharge from the neonatal unit, you should bring them to the attention of your support network of medical professionals, health and social care workers and feeding support team. It is possible to limit the impact of prematurity on oral feeding development and long-term feeding outcomes with good feeding support.



What supports are available to me outside of the hospital?

Oral feeding support for children and their families is not standardised in Ireland so the specific professionals who are available to help you will vary from region to region.

You should check with the staff on your neonatal unit what services are currently available in your area and how you can be referred to them (or how you can access them independently).

Paediatrician

Your Paediatrician or Neonatologist will be your first port of call if you have any significant concerns about your baby's ability to feed or their general wellbeing. As part of your preparation for discharge, you will be informed about when your baby will be reviewed by their Paediatrician or Neonatologist after you leave the hospital.

Speech and Language Therapist

Some Speech and Language Therapists working in community environments (e.g. HSE Early Intervention) will have expertise in the area of feeding difficulties. Much like the Speech and Language Therapist on Neonatal Unit, the community Speech and Language Therapist will support you to develop safe and age appropriate feeding skills as your baby matures. If you do not have a Speech and Language Therapist in your area who can support you and your baby around feeding difficulties then please contact the Irish Neonatal Health Alliance who can direct you to their feeding advisor for some informal advice.

You can find out more about Speech and Language Therapy services in Ireland through the Irish Association of Speech and Language Therapists www.iaslit.ie.

Lactation Consultant

International Board Certified Lactation Consultants are available in all regions in Ireland. They can support you around breastfeeding and assist you with any difficulties relating to milk supply, establishing latch, and breastfeeding multiples etc. Information relating to breastfeeding support in Ireland can be found at www.lalecheleagueireland.com and through the Association of Lactation Consultants Ireland at www.alcireland.ie.

Dietitian

Most Neonatal Units will have a dietitian as part of its core staff. The dietitian works to ensure that your baby receives the ideal nutrition to promote optimal growth. After discharge you may continue your relationship with your Neonatal Dietitian or you may access Community Dietitian Services as required.

Public Health Nurse

Your Public Health Nurse is an excellent resource for advising you around your infant's feeding development. They are also well placed to direct you to other support services that may benefit you as you progress through your baby's feeding milestones.



Observations about my baby

I feel my baby likes it when...

I feel my baby doesn't like it when...

Names and contact numbers of Health Professionals

Make a note here of the Health Professionals available to support you around your baby's feeding development:

Name:

Title:

Contact Details:

_____	_____	_____
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