Integrated Family Delivered Neonatal Care

Expert in your baby's care

Chapter 8. Fluids and nutrition - nursing

Parent educational material for app

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1. Introduction to fluids and nutrition in the neonatal unit

Intravenous fluid infusion, parenteral nutrition and enteral feeding are essential elements of nutrition and care provided in the neonatal unit. Intravenous devices, orogastric and nasogastric feeding tubes are used to deliver this.

In Chapter 10 'Nutrition and growth' you can read more about nutrition and growth; this chapter focuses on the different ways for fluids and milk to be given to your Baby. Generally, babies will receive hydration and glucose infusion after birth in the beginning and this will be followed by total parenteral nutrition (TPN) via a central access such as umbilical venous line or long line and the introduction of enteral feeding.

Usually TPN and lipids are infused through a central line, but can also cautiously be given through the peripheral intravenous cannula as well. Nasogastric or orogastric feeding is given to babies who are unable to take oral feeds by sucking, for example preterm babies.

Aims for this chapter

We want you as a parent to:

- understand the basic forms and principles of nutrition in the neonatal unit
- understand the various forms of intravenous devices that are used and their importance
- understand how these intravenous devices are used
- understand how you can help feed your Baby via a feeding tube in collaboration with the nurses.

1.1 Background to neonatal nutrition – when, why and how

Babies require nutrition from birth and as such it is important to start this as soon as possible after birth to replace what they would have been receiving via the placenta and umbilical cord. Babies that are born early or critically ill initially may not be strong enough to take milk yet. This is because they have not yet developed the ability to suck from the breast or a bottle.

Milk (colostrum, expressed breast milk or donor milk) is therefore given to them through a feeding tube. In addition to this, those born very early may not yet have the capacity to tolerate large quantities of milk in their stomachs and these babies may need to be fed through their veins intravenously while their digestive system matures and gradually allows for more milk to be taken.

This intravenous infusion may be a glucose and electrolyte solution or a solution called total parenteral nutrition (TPN) containing all nutritional elements (see Chapter 10 'Nutrition and growth' for more details). The glucose and electrolyte solution or TPN is infused via intravenous access devices through standard intravenous pumps (Figure 1) which can vary between various neonatal units.

Figure 1. TPN and other infusion being delivered to a baby using various infusion pumps and devices

1.2 Intravenous cannula

As soon as your Baby is born, they will require fluids to keep them hydrated and maintain adequate nutrition. A small yellow cannula will be inserted into their veins (in a hand, foot, arm or leg) using aseptic technique and clear fluids such as glucose and electrolyte solution will be started with medications like antibiotics.

The insertion of the cannula can sometimes be challenging given the small size of the babies and if the veins have all been used before. It will be inserted

Figure 2. Intravenous cannula secured to the arm in a mannequin

either by the doctors or trained nurses. They will need to be replaced every few days .

For smaller and sicker babies a central access will be secured in due course for them to be able to receive the parenteral nutrition and special medications required. For more stable and more mature babies this intravenous line can be used for parenteral nutrition for a few days till the enteral feed is gradually built up.

It is important to look for signs of redness and swelling along the cannula line and at the insertion site. After a period of time the cannula will stop working and may need to be re-positioned at another place and this is quite common.

1.3 Umbilical venous line

An umbilical venous catheter or line is a central venous access inserted in critically ill babies who will need parenteral nutrition (TPN) or are receiving medications to maintain blood pressure and improve contraction of the heart.

Generally any baby at less than 28 weeks of gestational age requires umbilical venous catheterisation to provide nutrition during the first days and deliver special medications as necessary.

A narrow, long catheter is inserted into the vessels in your Baby's belly button (umbilical vein) by the doctors under full aseptic conditions. The catheter is secured to the umbilical cord with silk sutures (Figure 3). The position of the tip of the umbilical venous catheter is ascertained with an x-ray following insertion.

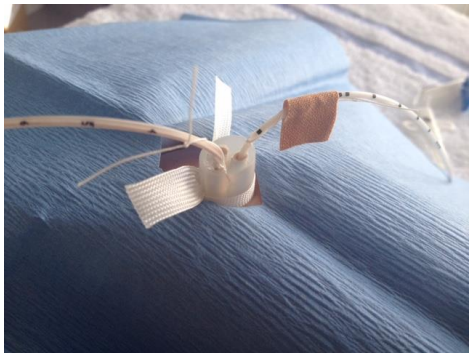

Figure 3. Umbilical venous and arterial lines inserted and secured in a mannequin

1.4 Umbilical arterial line

An umbilical arterial catheter or line is a type of central access inserted in babies who require continuous monitoring of blood pressure and frequent blood sampling. A narrow, long catheter is inserted into the vessels in your Baby's belly button (umbilical artery) by the doctors under full aseptic conditions. The catheter is secured to the umbilical cord with silk sutures (Figure 3). The position of the tip of the umbilical artery catheter is ascertained with an x-ray following insertion.

1.5. Long line

A long line is a very fine plastic tube inserted by a doctor under full aseptic conditions to the baby's larger vein. The end of the line is close to the heart (Figure 4). This is one type of central venous access which is used to deliver medications and parenteral nutrition (TPN and lipids) to the baby.

This procedure can be very challenging (especially in very small babies) and on some occasions may need several attempts. The position is checked by x-ray. The long line often replaces the umbilical venous catheter and can be kept in for a longer time depending on the needs of the baby.

Figure 4. Long line inserted and secured in the arm in a mannequin

The nurse will keep a close eye on it and aim to identify early signs of redness or swelling at the insertion point or along the course of the long line. The line will be removed if there are any concerns (blockage, leak or infection suspected) or if no longer required.

1.6 Orogastric or nasogastric tube – insertion and care

An orogastric tube (OGT) or nasogastric tube (NGT) is a soft plastic tube which is either inserted through the mouth or the nose, the tip of which should be in the stomach. This enables us to give milk to babies who are otherwise not able to have suck feeds (breast or bottle).

An OGT is generally used when the baby is receiving non-invasive ventilation in the form of CPAP or high flow through a nasal cannula. This is switched to a NGT as soon as the respiratory support is weaned.

Enteral feeds via OGT or NGT are started as soon as possible after birth, either with donor expressed breast milk or expressed breast milk or colostrum from the mother. The gut of a preterm baby is not fully developed in the beginning, therefore the milk feeds should be slowly built up over time. Sometimes babies won't tolerate feeds and hence this may need to be stopped and then restarted again when deemed appropriate, as decided by the medical team. Enteral feeding is gradually built up as tolerated and the parenteral nutrition is slowly reduced while nutrition and hydration is maintained.

Nasogastric or orogastric tubes will be inserted or changed regularly by the nursing team looking after your Baby. You will be allowed to feed your Baby with a tube when they are stable and you have achieved the necessary competency for giving tube feeds. This will involve fulfilling competency checklist of tasks such as checking the position of the feeding tube prior to feeds in the Steps to home booklet. You will initially be supervised by the nurses.

It is important to check the position of the feeding tube at the nose or the mouth and to make sure that this is still in place before feeding your Baby. Feeding a baby without checking the correct position of the feeding tube can result in vomiting and aspiration of milk into the lungs. In a small preterm baby this can be a considerable setback and potentially dangerous.

Figure 5. Nasogastric tube in situ and nasogastric feeding

You can also breastfeed your baby whilst a nasogastric feeding is being carried out by a nurse or even by yourself. Babies can be conditioned slowly for transition to full breastfeeding during their stay using such techniques. This has to be planned in liaison with our feeding team and the nursing staff.

You can read more about this in Chapter 14 'Journey to suck feed'.

Figure 6. Breastfeeding while feeding through nasogastric tube

Key messages and reflection:

After this chapter you should be able to:

- understand the different methods of nutrition provided in the neonatal unit
- be familiar with intravenous devices and infusion pumps
- learn how can you can help your Baby during tube feeds.

Further learning in this topic

If you wish to know more:

- ask our neonatal team at any time
- ask for one-to-one support from one of our Integrated Family Delivered Care Project nurses
- use this app or your Parent Binder to record notes and questions
- attend small group teaching in topic: **Fluids and nutrition**
- complete the section for Feeding journey in the Steps to home booklet

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