

## INFANT FEEDING

See also Milk Feeds (p.230).

### BREASTFEEDING

There is incontrovertible evidence that breastfeeding is the best way to feed babies:

- it is safe, simple and cheap
- breast milk is nutritionally designed specifically for the human infant
- breast milk is part of the baby's defence system, containing a battery of anti-infective substances, as well as living cells
- breast milk contains factors which optimise the growth of the developing human brain
- breastfeeding protects against the subsequent development of some "allergic" disorders (such as asthma)
- breastfeeding is a form of community family spacing.

### ARTIFICIAL FEEDING

There is incontrovertible evidence that artificial feeding is dangerous, unless the mother has sufficient money, education and time to buy and prepare the milk cleanly and in the right strength. Every effort should be made to discourage artificial feeding. In particular, every effort should be made to discourage the use of feeding bottles, dummies and feeding cups. If artificial feeding is used, CUP AND SPOON feeding is the preferred method. Babies adapt quickly to this method.

**The Baby Feed Supplies (Control) Act of 1977 and its amendment of 1984** aimed to protect Papua New Guinean children from the dangers associated with bottle feeding and to protect the practice of breastfeeding. Under this law:

1. Feeding bottles, teats, dummies and feeding cups can be obtained only from a registered pharmacy.
2. The mother or guardian must produce a prescription (authorisation).
3. Only a medical practitioner, HEO, nurse or nursing aide can write a prescription.
4. Before writing a prescription, the health worker must do the following:
  - a. Be satisfied it is in the baby's interest.
  - b. Instruct the mother or guardian how to clean the bottles properly (clean with a bottle brush and boil in clean water for 5 minutes or soak in sterilising solution).
  - c. Instruct the mother or guardian to keep the milk in a refrigerator if it is not immediately used.
  - d. Instruct the mother or guardian how to mix the milk in the correct strength.

Penalties (200K fine for a first offence and 500K for a second offence) can be imposed on health workers who do not follow these instructions, on unregistered outlets, or on registered outlets supplying bottles or cups without prescription.

This law has been only partially effective. A recent survey indicated that it is common for mothers to obtain feeding bottles and feeding cups without prescription from unregistered outlets. The Paediatric Society of Papua New Guinea is attempting through the Health Department to tighten the legislation and its implementation.

It is important that commercial premises selling bottles or feeding cups illegally should be reported to the Health Department Family Health Services and the Provincial Health Inspector.

The PNG Health Department has an Infant Feeding Policy which strongly advocates breastfeeding, urges the discouraging of bottle (and baby cup) feeding and indicates that bottle feeding should not be used in any health institution.

#### **If a mother asks for a prescription for a bottle:**

1. Try and find out why she wants to use a bottle.

2. Explain that bottle feeding is “second best” and puts the child at risk.
3. Encourage her to continue to breastfeed.
4. If she is going back to work suggest that she can express her milk for the baby and point out she is entitled to breastfeeding breaks (though facilities at most workplaces are non-existent or woefully inadequate). She should continue to breastfeed her baby before and after work.
5. If breastfeeding is not possible, discuss the other options and suggest that she use CUP and SPOON rather than a bottle.
6. Make sure (ideally by demonstration) that she knows how to make up the milk and the importance of cleaning all the utensils thoroughly.
7. If she is adopting the child, discuss the possibility of lactation induction (see p.182).
8. Encourage the mother to attend the clinic for regular weighing of her baby.

### **What milks are available?**

1. Milks with vitamins and iron added: the usual ones are Lactogen, SMA, S26 and Enfamil. These are all effective; Lactogen is the cheapest.
2. Full cream milk without vitamins and iron: common brands are Farm Fresh, Sunshine, Anchor and Pacific. Vitamins and iron have to be given as well.  

Vitamins: Pentavite is the cheapest. Other brands are Abdec and Poly Visol. Give 10 drops each day.

Iron: The Health Department supplies ferric ammonium citrate mixture and sometimes ferrous fumarate. Infant Fergon is the brand sold by chemists. Give 2 mg/kg elemental iron per day.
3. Do NOT use skim milk or low fat milks.

### **Which milk mixture to use**

For babies artificially fed at home, the best milk to use is one containing added iron and vitamins. For babies artificially fed in hospital or health centres, it is best to use full cream milk (eg Sunshine, Pacific, Farm Fresh, Anchor) with 10 drops a day of vitamin mixture (eg Pentavite, Abdec) and 2 mg/kg/day elemental iron.

### **How to make up the milk**

(See also p.231)

#### **1. For babies under 2 weeks old**

Use sugar-milk (Sunshine, Pacific or Anchor Instant milk): Mix 1 part by volume (eg cup or plastic medicine glass) of milk powder and half a part by volume of sugar with 6 parts by volume of cool, previously boiled water

#### **2. For babies aged 2 weeks or more**

Use full strength (Sunshine, Pacific or Anchor Instant milk): Mix 1 part by volume (eg cup or plastic medicine glass) of milk powder with 3 parts by volume of cool, previously boiled water .

If the milk cannot be kept cold in a refrigerator, only make enough milk for one feed at a time.

### **Milks used for special purposes**

(See p.231)

#### ***Milk oil formula (MOF)***

For malnourished children. Add 10 ml vegetable (eg peanut) oil, 2 heaped teaspoons of sugar and 5 ml of electrolyte mixture to 240 ml of full strength milk.

#### ***Low lactose milks (Digestelact or Nutramigen)***

Used for children with diarrhoea caused by sugar (lactose) intolerance. Mix 1 part by volume of Digestelact or Nutramigen powder with 4 parts by volume of cool, previously boiled water.

### ***Others***

eg Infasoy, Pregestemil, Triglyde or Ensure (a high calorie, no lactose milk substitute) may be available. Follow the instructions on the tin.

## **EDUCATIONAL DIET**

Start to give the baby mashed up food as well as milk by the age of 4 months. Feed the baby with a spoon. Breast milk by itself is not sufficient food for a baby after the age of 6 months. Breastfeeding should continue as long as culturally accepted. Even at 2 years of age, breast milk supplies a useful protein supplement. Malnutrition is often due to solid food being given too late and not often enough.

### **KEEP YOUR MESSAGE TO PARENTS SIMPLE:**

1. Start giving solid food when your baby is 4 months old. If you do not know how old he is, start when he is getting his first tooth
2. Give:
  - a. local staple (eg kau kau) and dark green leaves
  - b. mix in a spoonful of dripping, vegetable oil or margarine
  - c. "as bin" (wing bean) or mashed up peanuts or some animal protein (eg fish, meat or chicken)
3. Try and give solid food to your child 4-6 times every day, including snacks, eg banana, avocado, coconut, pawpaw.

## **ARTIFICIAL FEEDING AT HOME**

It is occasionally necessary for a baby to be fed artificially at home, eg if the child is adopted, or if the mother has died (but see Lactation Induction, p.182).

You must have the mother or guardian **SHOWN** how to make up a milk feed; do not just tell them how to do it. It is a good idea to have the notes that follow printed so that if the family is educated you can give them a copy **AS WELL AS** showing them what to do.

## **REFERENCES**

- Cameron M. Manual on feeding infants and young children. 3rd ed. OUP, 1983.
- Friesen H et al. (Paediatric Society of Papua New Guinea) Survey to assess the current feeding practices in infants and children below 2 years of age in selected areas of Papua New Guinea. Report to Dept of Health 1996.
- Friesen H et al. Annals Trop Paed Int Child Health 18:209-215,1998. Infant feeding practices in Papua New Guinea.
- Friesen H, Vince J, Boas P, Danaya R. Bull WHO 77(3):271-274,1999. Protection of breastfeeding in Papua New Guinea.
- Helsing E. Breast-feeding in practice. OUP, 1982.
- Jelliffe DB, Jelliffe EFP. Human milk in the modern world. OUP, 1978.

This page can be copied and given to literate parents to take home (but SHOW them what to do first):

### ARTIFICIAL FEEDING AT HOME

**BREASTFEEDING IS BEST.** Only use artificial feeding if you really cannot breastfeed. Use a cup and spoon, NOT A BOTTLE. In most cases, it is best to use a milk with iron and vitamins already added, such as Lactogen, S-26 or Enfamil.

#### How much milk to give:

Give babies as much as they want as often as they want. Most babies take 5-6 feeds every day. A guide to how much milk to give with each feed is to multiply the baby's weight in kg by 30 (maximum 240 ml per feed). A baby weighing 5 kg would be offered  $5 \times 30 = 150$  ml each feed 5 - 6 times a day. As the baby takes as much milk per feed as he or she wants, there should always be a little milk left over after each feed. So if the baby finished all the feed, offer a little more next time.

#### How to make up the milk (for babies aged 2 weeks or more):

(Using Sunshine, Pacific or Anchor INSTANT milk).

Mix EXACTLY 1 part by volume (eg cup or plastic medicine glass) of milk powder with EXACTLY 3 parts by volume of cool, previously-boiled water. Do NOT pack the milk powder down tightly into the cup when measuring it out.

Weight of baby	Milk powder	Boiled water
2 kg	15 ml	45 ml
3 kg	20 ml	60 ml
4 kg	25 ml	75 ml
5 kg	30 ml	90 ml
6 kg	40 ml	120 ml
7 kg	45 ml	135 ml
8 kg	50 ml	150 ml
9 kg	50 ml	150 ml
10 kg	50 ml	150 ml

IF THE MILK CANNOT BE KEPT COLD IN A REFRIGERATOR, ONLY MAKE ENOUGH MILK FOR ONE FEED AT A TIME.

#### How to make a cup and spoon feed (baby aged 2 weeks or more):

(Using Sunshine, Pacific or Anchor INSTANT milk).

Boil water to make the feed. Let it cool.

Measure one part of milk powder to 3 parts of water.

Beat the milk with the spoon to dissolve the powder.

Feed the baby with the cup and spoon.

Do NOT keep milk from one feed to the next.

Wash the cup, spoon and plastic measuring glass very well - then boil them for 5 minutes in a covered pot (timing starts from when the water boils after putting in the utensils).

Store them in the empty covered pot.

IF USING LACTOGEN, S26, OR ENFAMIL - MAKE SURE YOU READ THE INSTRUCTIONS ON THE TIN.

### SOLID FOOD

Start to give the baby mashed up foods as well as milk after the age of 4 months. Feed the baby with a spoon.

Locally available foods should be used. Start with mashed banana, pawpaw, kau kau, taro or other soft food. As the baby gets used to the taste of one food begin another food. By 8 months of age, the baby will usually hold a lump of food in his hand and chew on it. By 12 months of age, the baby should be eating the same kinds of food as the rest of the family. He or she should have at least 3 meals a day. Mix a spoonful of dripping with each feed.

It is important to give a mixed diet - one or more foods from each group at some time during the day:

Staple - kau kau, taro, yam, sago, rice or bread

Legumes and pulses - peas, beans (especially "as bin"), peanuts

Dark green leafy vegetables - aibika, pumpkin tops or sweet potato tops

Animal protein - meat, fish, eggs, soft insects (caterpillars, sago grubs)

Fruit or yellow vegetables - pawpaw, pumpkin, banana, pineapple, coconut

Oil, margarine, fat or dripping.

## INTRASOSEOUS INFUSION

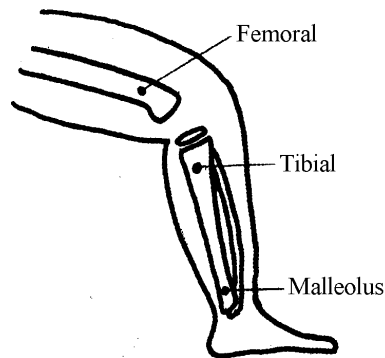
It is possible to give parenteral fluid rapidly into the bone marrow. In fact, the marrow cavity is an intravascular compartment, so the fluid is actually being given by intravenous infusion. This route is preferable to intraperitoneal infusion, since it is quicker and can be used in shocked patients.

Intraosseous infusion can be used for:

- circulatory collapse from severe dehydration, haemorrhage, burns, trauma and allergy.  
Intraperitoneal fluid is not absorbed in shocked patients
- when no veins are available because of prior use, obesity, oedema or burns.

Viscous fluids such as whole blood often do not run in rapidly by this route, and may have to be pumped in. Ordinary IV fluids will run rapidly without pumping.

1. The child is held firmly, lying on one side.
2. Scrub your hands.
3. Choose the site for infusion. In children up to 2 years of age the usual sites are 2 cm below the tibial tuberosity (probably the easiest), or the junction between the middle and lower third of the femur. In children up to the age of 5 years, the medial malleolus of the tibia is suitable, whilst for all ages the superior iliac crest can be used (see Bone Marrow Aspiration, p.57).



4. Clean the skin around the puncture site with iodine.
5. If the child is conscious, infiltrate the skin, subcutaneous tissues and periosteum with 1% plain lignocaine.
6. If available, use the specially designed intraosseous infusion needle and stylet. If this (or a bone marrow biopsy needle) is not available, use a standard size 18 or 20 needle. Push the needle through the skin in a direction slightly away from the joint if the upper medial tibial or malleolar sites are being used. When the needle hits bone, rotate the needle back and forward, applying more pressure until there is a definite “give” with decreased resistance indicating that the needle has entered the bone marrow cavity.
7. If using a needle and stylet, remove the stylet. Aspirate a small amount of bone marrow to check the position of the needle. Then use a syringe to push in 5ml of infusion fluid to clear the end of the needle. Now connect up the giving set. You may find that the drip slows with time. In this case use a syringe to re-flush the needle.

## REFERENCES

Practical procedures - circulation. Chap 23, p.221-232. In: Advanced paediatric life support. The practical approach. 3rd ed. London: BMJ Books, 2001.