Current Practice

CHILD CARE IN GENERAL PRACTICE

Infant Feeding To-day

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Infant feeding to-day is such a well-understood and successful business compared with yesterday that an article on the subject is apt to contain many platitudes. A few decades ago we were trying to apply new theories derived from researches into the composition of milk and at the same time were confused by the effects of infection masquerading as "indigestion." The way our babies thrive now is the result of abandoning theoretical tenets in favour of what works empirically—that is to say, we have moved from protein dilution and theoretical caloric needs in the direction of whole cow's milk and liberal amounts. The safety of our dried milks and a reduction in all types of infection has of course made the empirical approach easier to follow, for it has been easier to see what works and what doesn't. In the process sound general rules for the bottle feeding of babies have been developed, but breast feeding has partly gone by the board. The appeal of the visible feed, the measured square meal, is too strong.

Breast Feeding

Breast feeding, one might say, is still quite commonly practised, though less so after the baby is 8 weeks old. There are still those endowed with generous mammary glands and blessed with ductile nipples, those who are undisillusioned by defeatist talk or even an unhappy personal experience, and those who are about to do it for the first time. We should be able to give help when needed, but the know-how is gradually disappearing. Breast feeding is beset by many bad influences, and the two worst I think are these: (1) anxious preoccupation by the mother (shared by those who are helping her) concerning the quantity of milk the baby is getting, and (2) interpreting all crying as a sign of being unsatisfied.

In old-fashioned language a mother's answer to her baby's crying used to be just to "give him the nipple." The modern mother's reaction is to think "he needs 3½ ounces of half-cream national dried milk with a teaspoon of sugar, or the equivalent in breast milk if I have it." The modern mind is also bothered by the irregularity of the baby's calls for the nipple in the early days. Too few calls and we get engorged breasts, too many and we get sore nipples. The answer to both is the antenatal teaching of expression technique and care of unsatisfactory nipples before they come into use.

Expression Technique

One of the clinical tests for pregnancy is the appearance of a bead of secretion at the nipple when its base is gently squeezed. During the last five months of pregnancy the flow of this pre-colostrum can be increased by the technique perfected by Waller. First the breast is stroked from the base towards the areola, promoting the passage of secretion in that

direction. Pressure with finger and thumb just behind the nipple, imitating the action of the baby's jaws, then drives the rather viscous fluid (or, later, milk) out through the alveolar ducts.

In doing this daily or every few days ducts, both acinar and alveolar, are opened up and prepared for the flood of milk that they will later have to convey. Once there is colostrum or milk in the breast the second action with finger and thumb at the base of the nipple should become one of "milking." The pinching movement should be short, quick, and gentle and repeated about once a second so long as milk is produced. Common mistakes are to stroke the breast too firmly, damaging the skin with the thumb, squeezing the breast as a whole or the areola alone and trying to aim the spurt of milk into a cup or even smaller receptacle. The jets from the dozen or so alveolar ducts must be allowed to spray wide and must be caught in a big bowl. A breast can be emptied or the pressure in it reduced by this means at any time by the mother herself or by a midwife.

Nipples that are inverted or flat can be made protractile by the wearing of plastic shells well in advance of delivery, but if these defects are brought to light only after lactation has started it is, of course, too late.

Establishment of breast feeding requires confidence in the baby, who will use the breast appropriately as his needs grow, confidence in the milk supply responding to the baby's stimulation of the breast (which it will not do if he is given bottles), and the sacrifice of a little sleep. The successful continuation of breast feeding depends on the establishment of the "draught" or "let down" reflex, which enables the baby to drink a large quantity of milk in a short time.

Breast or Bottle?

An expectant mother who says she has decided in advance to put the baby on the bottle is probably influenced by one or more of the following objections, which may be the result of hearsay or of personal experience: breast abscess; sore nipples; painful uterine contractions as the nipple is stimulated; painful breast engorgement; limpet-like suction of some babies; milk trickling from the breasts between feeds; the physical intimacy with the baby (unpleasant? perhaps too pleasant? or even embarrassing?); the nuisance of it; putting on weight; "you can't tell how much the baby is getting"; "bottle-fed babies do just as well"; and "I don't want to begin if I am liable to fail." Quite a formidable list.

If a paediatrician were asked whether there were any very compelling reasons for breast feeding nowadays he would answer thus: in a breast-fed baby the colon is populated mainly by the *Bacillus acidophilus*; in a baby on cow's milk mainly by *Escherichia coli*. Pathogenic *E. coli* have a greater chance to grow in this bowel. The giving of only complementary feeds of cow's milk has the same result. The relative immunity

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of the breast-fed baby to gastro-enteritis needs no stressing. In a maternity unit the greater the number of bottle-fed babies the wider the door is opened to the entry of pathogens and the risk of an epidemic. The mortality of artificially fed babies used to be five times greater than the breast fed. The difference is now only slight, but in areas where coliform diarrhoea is endemic breast feeding is still a form of insurance and is all the more important where babies are crowded together, as in maternity hospitals. For all that, the proportion of babies born in hospital who are bottle fed continues to rise and many maternity units are having to install larger milk kitchens.

Breast-feeding rates also affect the welfare of our sick babies and prematures who depend for their feeding mainly on the abundance of other mothers. If the breast-milk-bankruptcy, now threatening, comes about they will be deprived of what is indisputably their ideal food.

Apart from these two strong reasons for encouraging breast feeding as a policy there is no very compelling answer to give the reluctant mother. A recent longitudinal growth study of two large groups of "well-born" American babies showed no difference between the breast and bottle fed. There have been many similar studies in which the superiority of breast milk over cow's milk as a food (premature babies apart) has never been established, where growth and weight are the criteria.

It seems, then, that the best reason we have left is the poetry. This is not as absurd as it sounds; a deep understanding is expressed by it and it is with poetry that life ought to begin. But this suggestion might ring a little false in an antenatal clinic.

Artificial Feeding

Once at the viva voce examination for the Diploma of Child Health a certain examiner began asking each successive candidate this simple question, "How would you feed a 10 lb. (4.5 kg.) baby?" It was of course thrown out as a talking point, but the news soon leaked back into the waiting-hall that everyone was being asked the same thing and it was amusing to see the agitation it produced in some, who evidently thought there was some trick about the 10 lb. and went in prepared with mathematical precision. The examiner, I know, enjoyed himself. Infant feeding must be flexible. Too much precision has often led to wrong feeding for an individual baby. However, some rules of thumb are essential for a start, and the examiner was evidently searching the candidate for a few guiding principles and a knowledge of how to deviate from the rules if necessary.

The first principle in infant feeding is that it should be enjoyed. To this end there are certain right and wrong tendencies:

	Right	Wrong
Temperature	Hot	Tepid
Formula	Strong	Weak
Quantity	Plenty	Too little
Time taken to feed	Fast	Too slow

The second principle is that when feeding with cow's milk it is better for the baby to adapt to the food (to become a little calf, so to speak), which he does very well, than to try to make cow's milk into breast milk—an impossibility except as an approximation.

Some dilution of cow's milk is necessary at the start, but this should become less and less as time goes on. Here a rule of thumb serves—that is, for a 3 oz. (85 ml.) feed (small baby or newborn) 1 oz. (28 ml.) water to 2 oz. (56.8 ml.) milk; for a 4 oz. (11.6 ml.) feed 1 oz. water to 3 oz. milk (3 measures of powder); for a 5 oz. (142 ml.) feed 1 oz. water to 4 oz. milk (4 measures of powder); and so on up to 1 oz. water to 7 oz. (198 ml.) milk; then 8 oz. (227 ml.) whole milk (or 8 measures of powder to 8 oz. water). When evaporated milk is used the dilution should be made *after reconstituting to whole milk* (1

part evaporated to 1½ parts water). If this step is omitted miscalculation may result and the baby receives feeds which are more concentrated than whole cow's milk. This is liked by some but not tolerated by others.

Cow's milk must also be cooked—that is, modified by heat. Drying and evaporating achieve this, so does boiling, which may be prolonged a little if the baby is just starting bottle feeding.

What then of "humanized" milks and other "scientific" adaptations? These very carefully prepared foods have their loyal supporters, but when we look at the millions of babies being reared on very simple modifications of cow's milk (fresh, dried, and evaporated) and doing splendidly in the rat-race we may well ask whether we could not do without them. Half-cream dried or evaporated milks have a period of usefulness for the premature or full-term newborn infants. These babies excrete in their stools a good deal of the fat of their feed whether breast milk or cow's milk and have better stools when given less, but after three or four weeks feel the caloric deficit in the half-cream feed.

Sugar

The frantic hunger which a baby appears to feel when his stomach has been empty for a while is partly relieved by the sense of repletion that feeding brings, but probably more by the rise of blood sugar which very quickly occurs when there is sugar in the milk. Protein and fat must be digested, absorbed, and metabolized before they can give the same satisfaction, and this takes time. The baby who starts to cry as soon as his feed is over may simply be expressing the fact that his hunger is not yet appeased because there is no sugar in his feed or not enough. He is in danger of having the size of his feed increased excessively or cut down or of being subjected to a diagnostic search for the cause of "pain." The addition of more sugar should be tried. Rule of thumb: one level teaspoon of granulated sugar to 3 oz. (85 ml.) of feed. This makes a 5% solution and with the lactose of the cow's milk brings the total up to about 8%. When the baby has reached 10 teaspoons of sugar a day any further additions of carbohydrate should be in the form of starch. There has always been a great tendency to timidity with sugar. It is blamed for the occurrence of sore buttocks regardless of the fact that it is all absorbed in the first part of the intestine.

Amount of Feed

The rule of 2½ oz. fluid per 1 lb. (156 ml./kg.) body weight per day has stood the test of time and still holds provided we add the words *not less than* 2½ oz. The 10 lb. (4.5 kg.) baby referred to by the D.C.H. examiner was probably having more than 25 oz. (710 ml.) a day and enjoying it. Always offer ½ to 1 oz. (14 to 28 ml.) more than the quantity calculated by the 2½ oz. per 1 lb. rule and never force the last half-ounce.

Getting the Wind Up

Sit the baby up and lean him forwards and sideways over his own left knee. This brings the air bubble directly under the cardiac orifice. The abdominal pressure drives it up in a very short time. If there is no belch there can't be enough air to bother about.

Intervals Between Feeds

Bottle-fed babies get on best when fed at four-hourly intervals with 15 minutes' latitude either side of the hour. They should be woken for feeds in the early months. Demand feeding with the bottle for some reason doesn't work, probably because the very large feeds, which the breast-fed baby takes comfortably

at long intervals, are too much for the stomach of the baby fed on cow's milk with its heavier curd.

Time Taken to Feed

The faster the better. The baby who is allowed to take it at good speed and carry on uninterrupted, orgiastically, to the end will get the maximum of pleasure, and that, as I have already said, is the first principle of infant feeding. Next best is the feed with a short break half-way through for breath and for a belch if necessary. Slow feeding is wrong both for body and mind, the interest and pleasure are lost. Infants who dawdle on for nearly an hour are soon in trouble with vomiting and failure to thrive. Sometimes it is simply due to a minute hole in the teat. This incredibly simple mistake may reduce a baby to a state of marasmus. Sometimes the baby does not suck but laps, an ineffectual way of getting milk out of a teat; suction is important. Put your finger in the baby's mouth and he will demonstrate how powerful it is.

Failure to thrive due to slow feeding usually responds quite quickly to the following management: (1) ensure a really easy flow through the teat; (2) insist on a time limit of 25 minutes; (3) insist on an interval of three and a half to four hours' sleep between feeds, however little the baby took in the 25 minutes allowed. To achieve this chloral is necessary, and a good dose should be given after each feed. Having slept the required interval the child wakes with an empty stomach, an appetite, and renewed vigour for the job.

Weaning

This used to be the first crisis in a child's life, but in modern times the process has been made so gradual that its passage is hardly noticed. For the mother the crisis was one of anxiety as to the baby's digestive powers being adequate for the new food and also that he might thwart her and in so doing suffer from not getting this food. For the baby it was the first experience of change and of having to give something up. Out of such forces disturbances can arise which are sometimes long-lasting. One occasionally meets with a child several years old who is stuck at the stage of bottle feeding or—though this is rare in Great Britain—refusing anything but the breast at a year old and whose mothers dare not force the issue. Cereals are now given earlier and earlier to babies by bottle and by spoon, the latest innovation being the serving of strained foods out of tins to newborn babies in a maternity ward. The mothers are said to be delighted to do this. The inappropriateness of it does not seem to bother them.

In other cultures the stages of weaning are bound up with religion and folk-lore and the symbolic or ritual significance of certain foods. Appropriateness and timing are very important. But an infant may miss some of the steps through illness and so be deprived of certain foods at a time when he needs them most.

The elimination of the element of crisis in weaning in our culture is on the whole a good thing, for though crises are necessary for normal growth of personality there is no lack of them in a child's early life, and the effects of too rapid and too rigid weaning are apt to be pernicious.

The Baby Who Vomits

In his approach to the problem of the baby who vomits the doctor should consider the following points: Is this an ill baby? Has he got an infection? (Otitis media, gastro-enteritis, infection of the urinary tract, meningitis—these possibilities should be thought of first, in that order of likelihood.) A mother will usually know that her baby is ill and if she thinks he is not she will not be much worried about the occasional vomit. Babies living in crowded, stuffy homes often have a pallid, sickly appearance, though they are not in fact infected. Apathy, poor tone, and slight dehydration make their appearance in addition when infection is present.

Is there any mechanical obstruction in the gastro-intestinal tract? Most of these conditions sort themselves out in the early weeks of infancy or the neonatal period, but anomalies of the mesentery giving rise to partial high intestinal or duodenal obstruction, if not diagnosed in the newborn, may give trouble in later months. Intussusception is a worry at any age, but the colic that goes with it wakes a baby from his sleep and no ordinary feeding problem does that.

In the feeding of the baby is there any serious deviation from the principles and rules of thumb outlined above? If so it is usually a simple matter to put it right.

Oesophageal reflux is such a common condition that it deserves separate consideration. It is well to remember that it is sometimes associated with projectile vomiting, though never with the constancy of pyloric obstruction. It also may cause oesophagitis with streaks of altered blood or even fresh blood and rather a lot of mucus in the regurgitated fluid. It is uncommon for a baby not to thrive pretty well in spite of the vomiting.

If none of the above conditions are found it is worth considering whether this mother and baby are really getting on with one another.

TO-DAY'S DRUGS

Dippers and Droppers

"The Urine . . . was wonderfully sweet as it were imbued with Honey or Sugar."

Fashions in urine testing have changed since 1679 when Thomas Willis described the sweet taste of diabetic urine. We have passed through the age of Fehling and Benedict and are now in the era of the deceptively simple "stick-tests." So convenient are they that the physician who boils a soup of urine and chemicals is becoming as rare as the one who can describe the taste of his patient's excreta. The apparent simplicity of these methods is misleading, and understandably few of the "dippers and droppers" know the chemical nature of the reactions and the errors which may be involved. A brief review of the tests may therefore be of value.

Urine Protein

The principal test now in use is Albustix, marketed by Ames Co. This utilizes the "protein error of indicators" discovered by Sorensen.¹ Many acid-base indicators change colour at a different pH in the presence of protein. Albustix consists of a paper strip impregnated with a citrate buffer of pH 3, and an indicator, tetrabromophenol blue, which is normally yellow at this pH. When the paper is dipped in a solution containing protein the indicator turns blue.

The reliability of this test has been extensively investigated and it appears quite satisfactory for routine purposes; it can detect a concentration of about 10 mg. per 100 ml. of protein.²⁻⁵ It might be expected that alkaline urines would give false-positive reactions due to the change in pH overcoming the