REFRESHER COURSE FOR GENERAL PRÁCTITIONERS**MANAGEMENT OF THE PREMATURE BABY**

BY

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According to official figures twice as many premature infants die each year in Great Britain as the total number of all persons killed on the roads. This indicates the seriousness of the problem. Half of these deaths occur in the first 24 hours of life and present a challenge to the obstetrician to prevent premature labour, but better management of the survivors would go far to reduce the loss of life. Although figures in connexion with prognosis are somewhat contradictory, the position can be summed up by saying that except for a slightly increased risk of cerebral trauma at birth the prematurely born infant has as good a chance as any other baby of growing into a normal and useful citizen.

Details of management to be discussed here are deliberately planned for what may have to be carried out in the patient's home. Some think this is a better place for premature babies than a hospital; others believe that the hospital can offer facilities and apparatus far superior to those available in a house. This should have been remedied to some extent since 1944,¹ when local health authorities were advised to keep certain appliances on hand for use in the home. A general practitioner called upon to look after a premature baby should certainly contact the medical officer of health for the district and see what apparatus he can get, and the services of a paediatrician should be available to lend expert help if required. More important than any apparatus and the aid of the expert, however, is good nursing. Some midwives are more skilled with small babies than others, and it may be possible to secure the services of one who has had special experience with premature babies—for example, at a maternity hospital with a special unit for their care.

General Management

If premature labour has set in and a small baby is expected certain preliminary steps can be taken. It is wise to give the mother a dose of vitamin K. A cot or basket should be prepared with lined sides to prevent draughts. If time permits an oxygen cylinder should be obtained, with a close-fitting rubber mask or a nasal catheter for administration.

After the baby is born it should be wrapped in a warm towel and placed head downwards in the cot or basket, which should be suitably tilted. Gentle wiping out of the mouth and gentle aspiration with a rubber catheter will make sure that the air passages are clear. If available, oxygen may be administered for a short period to produce a good saturation of the arterial blood. If respiration is feeble carbon dioxide from a "sparklet" apparatus may be used, or some device improvised to secure a degree of rebreathing.

It must be remembered from the start that the greatest enemy is infection, and in the early days the nurse and doctor should wear an efficient mask and conduct all manipulations with an aseptic or antiseptic technique.

The room in which the baby is to be nursed must be kept warm—70 to 75° F. (21–24° C.) is ideal—in addition to the careful use of hot-water bottles in the cot or the employment of an electric blanket pad (which can be hired in some areas). The aim is to keep the baby's rectal temperature not below about 98° F. (36.7° C.), but this is sometimes not achieved for a few days. The temperature should certainly be taken and recorded four-hourly. The atmosphere must also be kept moist enough to minimize "evaporation" from the baby's skin and lungs. A wet towel hung over the back of the chair, with its end in a bowl of water and placed near a source of heat, will provide a reasonable degree of humidity. A bathroom, if available and able to be temporarily set apart for the baby, is often ideal because of its humidity.

When the baby has recovered from the initial shock and is breathing well and a good colour the nurse may give it a gentle cleansing. This is most efficiently accomplished as a modified blanket bath with soap and water and a soft flannel, exposing only a small portion of the skin at a time. Drying should be carried out by gentle dabbing with a warm, soft towel, followed by a suitable baby powder (olive oil is messy, an inefficient cleaning agent, and not always sterile). The normal procedures for care of the eyes and cord should be carried out. Napkins can be applied, and the baby dressed in a gamgee jacket, booties, gloves, and a bonnet, leaving only the face exposed. The bedclothes must not be too heavy. Before this dressing-up, however, the weight should be obtained if the baby's condition permits, for it is a most valuable base-line from which to judge subsequent progress. The infant should now be left in its cot and disturbed as little as possible, except to be moved from one side to the other from time to time to promote full expansion of the lungs. Oxygen may still be required at intervals if the colour does not remain good.

All these measures are necessary at first, but from the start the programme of management must be designed to speed up the process of maturation. That is to say, the baby must be brought daily nearer to the normal standards of care of the full-time infant. The external temperature of the room can be gradually lowered, some of the gamgee clothing cut away, and hot-water bottles or blanket pad left out of the cot for brief but increasing periods. It is difficult to lay down precise details to cover premature babies of all weights. Careful judgment is required, and the experience of the nurse is invaluable. I must stress the necessity for making progress and not keeping the baby too long before his own heat-regulating mechanism is called upon to take action.

Feeding

The same difficulty over precise details arises in connexion with feeding. Certain general principles will be discussed and, as far as possible, their application to a group of infants whose weights range from 2 lb. (1 kg.) or less up to the official standard of 5½ lb. (2.5 kg.).

¹Ministry of Health circular 20/44.

Methods.—Most premature infants are too weak at first to suck at the breast, so that easier methods must be tried. In order of decreasing strain on the baby, after breast-feeding these are : sucking at an ordinary bottle ;

Feeder for premature infant. (By kind permission of John Bell and Croyden, Ltd.)

the use of a Breck feeder (a small bottle with a rubber nozzle at the end opposite the teat, like the old-fashioned fountain-pen filler, by which positive pressure can be exerted) ; a spoon or pipette to drop the feed into the mouth ; or tube-feeding by a catheter passed down the oesophagus through either the nose or mouth.

The first thing to establish after the baby is born is whether or not he can swallow. A little sterile water from a spoon can be tried. If there is no swallowing reflex, tube-feeding will clearly be necessary. If the baby can swallow, the next thing to ascertain is whether or not sucking can be carried out. If sucking proves possible a Breck feeder is the simplest apparatus : if not, a spoon or tube should be used according to the ability to swallow. The experienced nurse can soon determine a way of mixing the methods of feeding—one or two tube feeds and the rest by spoon, or starting the feed with a bottle and finishing with a spoon when the baby gets tired of sucking. Here, too, progress must be made and each day should see an attempt to take the baby a stage up the scale—tube, spoon, bottle—with the object of getting him to the breast.

Feeds.—Breast milk is the safest and most easily digested food. All premature babies should receive it at first even if it cannot always be continued. For the first 24 hours sterile water in small sips should be used, and during this period efforts to secure a supply of breast milk can be made. Only a few ounces a day will be required at first and should be obtainable without much difficulty from any nursing mother or from a maternity unit. It should be boiled and diluted to one-fourth strength for the very small babies and to one-half strength for the medium and larger-sized infants. Meanwhile the baby's own mother's supply of colostrum and milk should be obtained by manual expression.

By the end of a week or 10 days the breast milk can be given undiluted. If a supply proves impossible to obtain and no more can be got from the baby's own mother an alternative has reluctantly to be used. To avoid subsequent changes a choice should be made of a dried milk, either one of the so-called humanized varieties or a half-cream brand. These dried milks have the additional advantage of being obtainable at the local welfare centre. Either of these milks can be given from the second or third day of life and in a dilution which may vary from an eighth or quarter-strength, according to the baby's size, up to half-strength. One measure of milk powder to an ounce (30 ml.) of water may be assumed to be full strength. An attempt should be made to increase the strength daily, aiming eventually—in the second or third week—at full strength for the humanized brand and three measures to 4 oz. for the half-cream variety.

For simplicity, the addition of substances to the milk is not recommended. Some authorities prescribe additions of soluble casein and others prefer to use evaporated milk, sweetened or unsweetened, but the programme outlined above works well and, as has been said, minimizes changes when the infant is older.

Times of Feeding.—Quantities and intervals of feeding are related. It must be remembered that small babies require relatively more food than full-term infants. If the basis for a 7-lb. (3 kg.) baby is $2\frac{1}{2}$ oz. of breast milk per pound (150 ml. per kg.) body weight per day, then the smaller infant may require as much as 3, $3\frac{1}{2}$, or even 4 oz. per pound before a steady weight gain is achieved. But, as with normal babies, such a full feed programme should not be attained too quickly. If the largest feed, in volume, is achieved by the seventh to tenth day, this is usually safe. If dried cow's milk is being used progress should be slower and for the smallest babies the full size (and strength) not reached until a little later. Provided that no oedema develops the weight curve is a most valuable guide and the experienced nurse can increase the strength and size of the feeds to keep pace with the strength and requirements of the infant. With the smallest infants this will usually mean beginning with feeds of 30 to 60 minims (1.8–3.5 ml.) every hour by day and two-hourly by night. Gradually this is increased to $\frac{1}{2}$ oz. two-hourly by day and three-hourly by night, until 1 oz. is taken every three hours round the clock. If the mother's milk supply has been established the infant may be tried at the breast at least once a day if over 4 lb. (2 kg.) in weight at birth, or when this weight is achieved. Even smaller babies, especially if twins (and therefore relatively more mature than the weight indicates), can suck quite strongly under this weight.

Whatever the feed a start should be made with vitamin supplements when the infant is a month old. Vitamin C as ascorbic acid in 25-mg. daily dosage can safely be given even before this. Vitamins A and D are best given as a vitamin concentrate to allow 1,000 to 2,000 units of vitamin D daily, and such dosage—twice the requirements for a full-term baby—should be continued throughout the first year. Iron is also best administered early, say at two to three months, and given in Mackay's mixture in a dosage of 1 gr. (65 mg.) three times a day.

Two other medicaments are also worthy of mention. Some paediatricians give all babies vitamin K after birth to prevent hypoprothrombinaemia, and, as already suggested above, if premature labour is anticipated this vitamin can be given to the mother also. Thyroid extract has a useful part to play. If the baby is particularly sluggish and difficult to rouse and has a subnormal temperature, the metabolism can certainly be stimulated by giving the equivalent of 1/10 gr. of thyroid extract per pound (14.4 mg. per kg.) body weight daily. This should generally be administered for a few days only, after which the increased food intake will itself stimulate metabolism.

Thyroid extract is the only safe stimulant for the premature baby. Brandy appears to be used fairly frequently, but it is irritating to the stomach and intestines and if given in stimulating dosage may produce a dangerous gastro-enteritis. If the baby is kept adequately warm and gently handled brandy should be unnecessary. If anybody needs it, perhaps the doctor and nurse should be considered.

A circular to hospital boards and committees from the Ministry of Health asks hospital management committees to ensure that medical superintendents of mental hospitals and mental deficiency institutions see a copy of all documents on the work of the hospitals and institutions issued to the committee by the Ministry or the Board of Control. It also warns hospital management committees that they should not alter the authorized accommodation in mental hospitals and mental deficiency institutions without the approval of the Ministry of Health.