

Contemporary Themes

Special care nurseries: admitting to a policy

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Abstract

Few criteria exist for identifying which babies merit special nursing care, and many asymptomatic babies are offered such care unnecessarily. Birth weight is usually used to identify babies in need of special care at birth, but gestational age is a better discriminator. Babies of more than 35 weeks' gestation do not normally require admission to a special care nursery. Those pre-term babies who are admitted can usually be discharged at 37 weeks' gestation even if they still weigh less than 2000 g.

Introduction

"There is little factual information about the criteria for admission to special care," the Court committee noted when discussing maternity care in 1976. "The question is an important one because newborn babies should not be deprived of any medical or nursing care which may be needed, nor should they be unnecessarily separated from their mothers."¹

A survey of provision of special care in the Northern region, conducted seven years after the above comment was published, showed that wide variations in clinical practice still existed. The Sheldon report in 1971 suggested that all babies weighing less than 2500 g at birth and all babies delivered by the breech, by caesarean section, or with forceps should be admitted to special care.² More recently such a blanket policy for assisted delivery has been comprehensively challenged³ and its inappropriateness subjected to editorial comment.^{4 5} Even so, many maternity units still have vaguely defined criteria for regulating admission, and such criteria as there are are often only poorly validated. Admission policies also vary greatly from one unit to another, and I thought that the background to this variation required further study.

Local experience

It seemed right to start by validating the admission criteria used in this hospital, where about 2700 babies are delivered every year. Twenty three per cent of all babies were admitted to special care in 1977, but only 8% in 1982. In the process of effecting this change of policy the staff looked carefully at the nursing needs of all the babies born in the hospital. These needs had, in the past, nearly always been related to birth weight, but the midwives found a much closer correlation with gestational age.

Respiratory problems are the commonest problems requiring treatment in the neonatal period. The need for resuscitation at birth was

much more closely related to gestational age than to birth weight. So too was recurrent neonatal apnoea and the need for supplementary oxygen for more than six hours after birth. The correlation between gestational age and surfactant deficiency is well known: surfactant deficiency was uncommon in babies of more than 35 weeks' gestation and virtually never occurred in babies of more than 37 weeks' gestation. The few babies of more than 37 weeks' gestation who required supplementary oxygen had almost all inhaled vernix or meconium in utero. It is important to remember, however, that hyaline membrane disease is not limited to babies of low birth weight; half the cases in booked patients occurred in babies weighing more than 2000 g at birth and 20% in babies weighing more than 2500 g. These babies can be jeopardised if their respiratory distress is not promptly recognised and correctly handled in the first few crucial hours of life, and this is one of the reasons why many paediatricians have such a "liberal" admissions policy for special care.

Feeding problems are the reason why most babies require additional nursing care after birth and the commonest factor delaying the babies' discharge home. Here there was an even stronger correlation with gestational age. Almost all babies of less than 35 weeks' gestation at birth required supplementary orogastric or nasogastric "tube" feeds; very few babies of more than 36 weeks' gestation at birth required tube feeding (fig 1). Babies born two months or more before term first

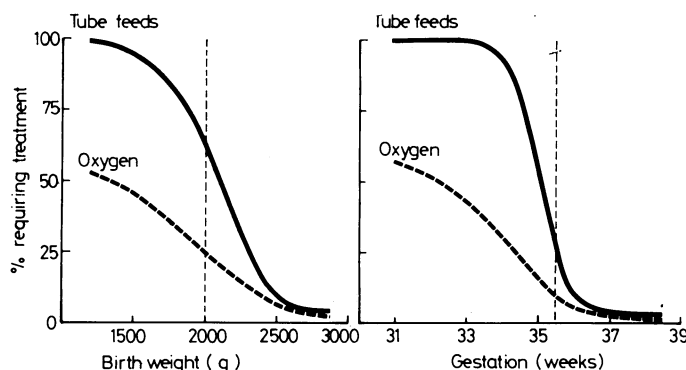


FIG 1—Association between birth weight and gestational age and proportion of babies found to require more than four tube feeds, or more than eight hours of supplementary oxygen. Data relate to all 5300 births at Princess Mary Maternity Hospital in 1981 and 1982.

showed some ability to suck from the bottle or breast at 33-34 weeks' gestation and usually no longer required gavage feeds three to four weeks before their expected dates of delivery (unless they still had dyspnoea as a result of chronic ventilatory lung damage). Some babies weighed only 1600 g at this time while others weighed almost twice as much (fig 2). Thirty eight per cent of the babies of booked patients who needed regular tube feeds weighed more than 2000 g at birth and 7% weighed more than 2500 g.

Prophylactic nursing care—Gestation is of less decisive help in determining which babies are at risk of developing hypoglycaemia or hyperbilirubinaemia, but anticipatory care still remains a vital element of good nursing care. As a matter of policy for more than 10 years all babies with a birth weight below the fifth centile were routinely

admitted to the nursery at birth to minimise the risk of early neonatal hypoglycaemia, but this practice was stopped four years ago and no case of symptomatic hypoglycaemia has occurred in a light for dates baby. Phototherapy has now been used for more than 12 years to prevent jaundice reaching a potentially dangerous level. Initially, this required that the baby was kept in, or transferred back to, the special care nursery, but for the past six years phototherapy has been undertaken without incident on the postnatal wards.

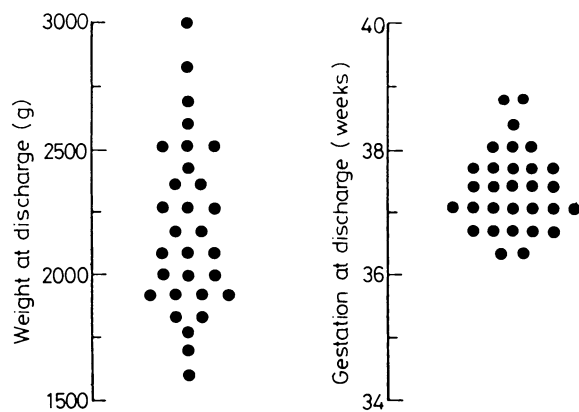


FIG 2—Body weight and gestational age at time of discharge in babies born more than seven weeks before term (taken as 40 weeks). Data relate to all births at Princess Mary Maternity Hospital in 1982 (except for five babies with chronic lung damage after ventilation). Babies were discharged home as soon as they no longer needed supplementary warmth or oxygen or gavage feeding.

Hazards—There are certain recognised hazards associated with admission for special care. Many, though important, are difficult to document.³ At least seven relatively healthy babies (who probably never needed admission) were cross infected while in the special care nursery, and no cases of cross infection were documented in the same five year period elsewhere in the hospital. Cross infection causing septicaemia due to salmonella, meningitis due to listeria, ophthalmic infection with pseudomonas, and severe gastroenteritis due to pathogenic coliforms is a serious matter. Brief separation does not usually cause a mother to give up breast feeding before discharge from hospital but we found that admission to special care even for less than 24 hours almost halved the likelihood of a mother sustaining her lactation for 12 weeks.⁶

Current indications for admission—With these findings in mind this hospital now admits all babies of less than 36 weeks' gestation to special care at birth whatever their weight (4% of all booked patients). The 2% of babies born at 36 weeks' gestation are also examined with particular care for signs of respiratory distress (particularly after delivery by caesarean section), but the only other asymptomatic babies admitted, even transiently, to special care after delivery are babies weighing less than 2000 g. We have this proviso regarding weight because some babies who are very light for dates require supplementary warmth for a time, and a few are so wasted that they are very reluctant to feed for some days after birth. Most babies of more than 34 weeks' gestation now join their mothers within two to five days of birth whatever their weight. Babies requiring resuscitation at birth are admitted only when signs of respiratory difficulty or shock are still present 10 minutes after the start of resuscitation, and babies with haemolytic disease are admitted only when they show appreciable anaemia (haemoglobin concentration < 11 g/dl) at birth. Similarly, malformed babies are generally admitted only if they show respiratory difficulty, possible cyanotic heart disease, or evidence suggestive of intestinal obstruction. None of the babies managed on the lying in wards has come to any recognisable harm since criteria for admission were redefined in this way (an observation already amply confirmed by others).⁷

Regional variation

In the light of this review I thought it appropriate to see how local practice compared with that currently followed by the other maternity units in the Northern region.

The proportion of babies admitted to the 20 special care nurseries varied fourfold, and, with few exceptions, admission patterns had

remained remarkably constant, although there had been a slow steady decline in the proportion of babies admitted to most of the units between 1977 and 1982. These patterns bore no relation to the proportions of operative deliveries or of low birth weight babies born in the hospital, and they were not influenced by staffing levels on the nursery or by interhospital transfer. Admission policy did not seem to correlate with neonatal mortality or with the presence or absence of resident paediatric cover: one of the six consultant units without such cover admitted 6% of its babies, while another admitted 33%. The five units undertaking a large amount of ventilatory care admitted relatively few babies (8–15%), but six of the remaining units admitted more than a quarter of all their babies to special care each year until 1981. Several units admitted all babies requiring resuscitation for observation, together with all the babies subjected to forceps, breech, or caesarean delivery, and this alone could account for up to 20%, or even 25%, of all births. A study of all the early neonatal deaths of babies weighing more than 2500 g in the region in 1981 and 1982 showed that, despite these high admission rates, only 43 of the 96 babies who died without an obvious malformation of the central nervous system had been admitted to special care at birth. A high admission rate does not necessarily, therefore, ensure the admission of the majority of babies at greatest risk.

Jaundice—The number of term babies (≥ 37 weeks' gestation) receiving phototherapy varied eightfold, and many units admitted all babies requiring phototherapy to special care. One large unit that routinely used phototherapy for all babies with a total serum bilirubin concentration of more than 250 $\mu\text{mol/l}$ (15 mg/100 ml) treated 3% of all its term babies for jaundice, but another large unit treated only 0.4% of its babies, reserving phototherapy for those in whom serum bilirubin concentration reached 340 $\mu\text{mol/l}$ (20 mg/100 ml) and in whom the Coombs test was negative.

Hypoglycaemia—There was similar wide variation in the management of babies who were light for dates. Quite a few units admitted to special care all babies with a birth weight below the fifth centile; several fed all these babies every four hours to a fixed intake schedule, and one unit gave all these babies intravenous glucose for the first 36 hours of life. Many units monitored the blood glucose concentration on the nursery with Dextrostix every six to 12 hours. Several large units, on the other hand, that made no special provision for most of the babies who were light for dates (but encouraged early feeding, on demand, as a general policy) had not had a single case of symptomatic hypoglycaemia in a baby who was light for dates for at least four years even though an increasing number of the babies were exclusively breast fed.

Cot occupancy—Few of the nurseries had a cot occupancy of more than 60%, but there was a positive correlation between the number of cots and the proportion of all hospital births admitted to the nursery each year until 1982 (fig 3). Only six of the 20 consultant units in the region currently deliver more than 2000 babies a year, but all but four of the special care nurseries with separately designated nursing staff have at least 14 cots, and the region is, in consequence, unusually well endowed with special care cots (8.1 cots/1000 deliveries). There had been a 40% rise in the number of babies admitted to special care in the

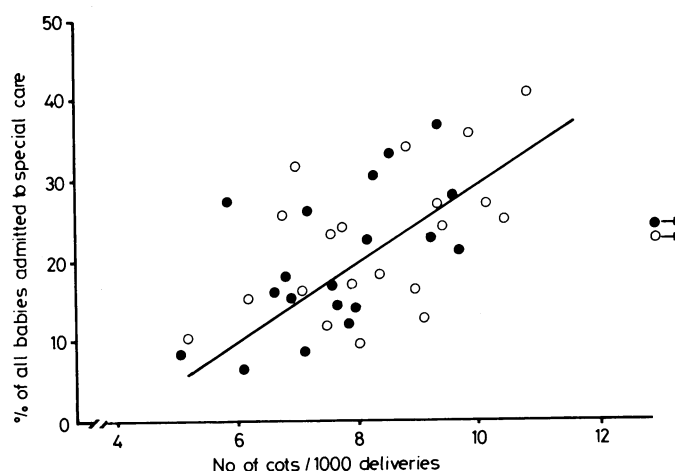


FIG 3—Provision of nursery cots and proportions of babies admitted to nurseries in the Northern region in 1978 (●) and 1979 (○). There was a significant positive correlation ($r=0.45$). The line of best fit for 1978 is also shown.

region between 1964 and 1971 and a less dramatic rise in the proportion of babies admitted. This was accompanied by an increase in the provision of accommodation (5.7 rising to 7.3 cots/1000 deliveries). The proportion of all babies admitted, however, continued to rise after the building programme was completed despite a progressive fall in the birth rate, and the total number of nursery admissions remained roughly constant until 1980. More than 20% of all babies were admitted to special care each year from 1973 to 1978.

National trends

Even more pronounced national trends were found when the unpublished returns of the Department of Health and Social Security were analysed. The proportion of all babies admitted to special care trebled between 1964 and 1977. As the proportion of low birth-weight babies was constant throughout this period, the rising rate of admission was clearly caused by the referral of an increasing number of babies weighing more than 2500 g at birth (fig 4). A reversal of this

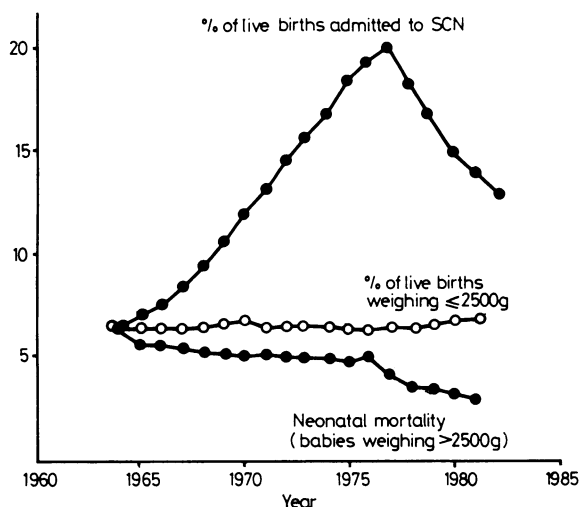


FIG 4—Rates of admission to special care nurseries (SCN) in England and Wales, rates of delivery of low birthweight babies (live births ≤ 2500 g), and neonatal mortality in babies weighing over 2500 g (deaths/1000 live births > 2500 g).

general trend was first noticeable in 1975 in Oxford and East Anglia, and a similar reversal was detectable in every region of England and Wales in 1978. The three regions in south west England were the only areas to remain relatively unaffected by these trends.

Mortality—There was no significant improvement in neonatal mortality among babies weighing over 2500 g at birth between 1968 (when fewer than 10% of all live births were admitted to special care) and 1976, although the proportion of babies admitted to special care doubled over this period. Since 1976 there has been a pronounced decline in neonatal mortality in babies weighing over 2500 g at birth (and in low birthweight babies) and a definite fall in the proportion admitted to special care in England and Wales as a whole (fig 4). It is hard to argue, therefore, that the high admission rates popular five to 10 years ago saved many lives.

Discussion

These findings invite at least three general comments. Firstly, there seem to have been two slow, broad swings of fashion in Britain during the past 20 years (fig 4) as paediatricians developed a missionary zeal first for active neonatal "management" and then for the "problems" of neonatal bonding. Secondly, there seems to have been a strong unconscious tendency until recently for the amount of space in the nursery to influence admission policy (fig 3). Thirdly, policies regarding admission differ so widely at present that one can only suspect that current practice owes more to tradition than it does to logic. Indeed, in many units

there is no clearly defined policy and decisions tend to be left to relatively junior and inexperienced midwifery and medical staff, who, quite naturally, tend to "play safe" by arranging admission to a special care nursery in the knowledge that they are more likely to be criticised for underreacting than for overreacting.

Those concerned at the large number of healthy babies being admitted for special care have generally argued that birth weight should be the main criterion determining admission in any asymptomatic infant¹ even if it is not an appropriate criterion for timing discharge (fig 2).⁸ Nevertheless, if the threshold is set at 2500 g³ there is no doubt that many small but mature babies will be admitted to special care unnecessarily, while if the threshold is lowered to 2000 g many babies requiring special care will find themselves sent initially to the lying in wards. A policy of admitting all babies weighing over 1800 g to the lying in wards "unless they are ill" may work well in a major referral centre with highly experienced staff⁷ but is not easily applied in the many small obstetric units that still lack resident paediatric staff (and such units still supervise the delivery of nearly a quarter of all the babies born in this region each year).

The evidence presented here suggests that gestational age is a better criterion than weight for identifying those asymptomatic babies meriting admission for special care at birth, and as a result of the increasing use of ultrasound in the first trimester of pregnancy gestational age is now usually fairly precisely known even in those pregnancies for which the menstrual history is uncertain. Where doubt remains a quick review of the baby's physical appearance using, for preference, the Parkin score,⁹ which has been validated for use immediately after birth, should settle the issue without difficulty. This simple four point score is easily learnt by midwifery staff and gives the gestational age to within 15 days either way in 95% of babies of 33-41 weeks' gestation (and these are the babies for whom assessment is most likely to be of immediate practical importance). Very few babies of more than 35 week's gestation need supplementary oxygen, incubator care, or sustained help with feeding (fig 1). Gestational age can be used, therefore, to decide which of the many asymptomatic small babies are suitable for routine postnatal care at birth.

It is often argued that it is difficult to provide enough experienced staff to care for these small but healthy babies safely with their mothers on the lying in wards, but in practice the problems soon melt away as staff gain confidence and relearn lost skills, especially where there is a scheme for early discharge to community care after 12-36 hours when the baby is not small and delivery has been straightforward. The real difficulty with such a policy is that it reduces the number of babies requiring special care to the point where there may be fewer than six babies left in the nurseries of many of the smaller maternity units. Perhaps we have fallen too readily into the trap of assuming that a special care nursery must be a separate autonomous unit and a unit without mothers' beds in it. There is no good reason why the special care nursery should not be a specialised part of one of the ordinary postnatal wards other than the sullen inflexibility of much contemporary hospital architecture. This would, at a stroke, greatly diminish the importance of developing any detailed policy regarding admission and abolish the need for any mother to be separated from her baby at birth.

A sociologist might suppose that the development of separate special care nurseries owes more to the need paediatricians used to feel for a secure territorial base in a once refractory obstetric environment than to the need for most small babies to be nursed in isolation. Thirty years ago, when most mothers were still delivered at home, most of the preterm babies born in Newcastle were also cared for at home.¹⁰ and many other areas pursued a similar policy. Independent hospital nurseries first came into fashion in areas that preferred to admit preterm babies delivered at home to hospital for nursing care. My predecessor at that time in this hospital would never have dreamed of building a unit for preterm babies unless it contained provision for mothers too.¹¹

Asked why he had climbed Mount Everest, Sir Edmund Hillary is said to have replied, "Because it is there." That is certainly not

an acceptable guiding principle when formulating an admissions policy. Unless we formulate reasonably precise and rational guidelines to regulate admission to special care nurseries after birth it becomes difficult to rebut the charge that many babies still get separated from their mothers and admitted for special care just "because it is there."

I am grateful to all my consultant colleagues in the Northern region for their help and constructive comment during the conduct of this review, and to the nurses and midwives in Newcastle, who rose so magnificently to the challenge of reviewing their routine nursing practice.

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(Accepted 31 August 1983)

MATERIA NON MEDICA

My son, the actor

As Christmas approaches once again my wife and I remember our son's debut, in his first term at school, as a star in the school's Nativity play. Along with dozens of other parents we crowded into the assembly hall cum theatre; the walls decked with infantile artwork, the miniature chairs and tables and the PE "apparatus" all served to bring back memories of our own childhoods, and as the headmistress courteously greeted us all in that clear precise voice that only infant teachers have I for one felt an almost irrepressible atavistic urge to mumble back "Good morning, miss."

The performance began with songs and recitations by second-year and third-year infants. Self-consciously and in deadly earnest each child made his or her contribution. Serious faces searched the audience for parents, sibs, and friends. As these were recognised the performers visibly relaxed—some actually appearing to enjoy the occasion. Once the ice was broken by the older children the youngest began to make their appearances, in succession and to an appropriate musical accompaniment. Not trusted with words they simply walked on to the stage and assumed a pose facing the audience. First came Mary and Joseph with odd angels and beasts of the stable, then appeared the shepherds and finally the three kings. As the second of the three kings appeared my interest sharpened for this was my son, the actor. He walked on perfectly. He held the frankincense perfectly. He stood still perfectly, at first.

But during the second chorus of "We Three Kings" he saw the family. The smile of recognition gave way suddenly to the steely Clint Eastwood gaze. Suddenly the scenario changed. The frankincense held now only in the right hand left his gun hand free and from beneath his king's gown he drew from an imaginary holster an imaginary Colt '45. Calmly he took aim at us and began firing, to the amusement of the audience. I find it difficult now to pinpoint my main feelings at this time. I can remember wondering with some anxiety, "What is he going to do next?" But in fact all he did was replace his imaginary revolver and get on with the business of being a king. I wonder if he'll get a part in the school Nativity play this year?—J P SUNTER, consultant histopathologist, Gateshead.

Owlie

Many years ago I was called to the country late at night to see a maiden lady of 50 odd years of age with a suspected acute appendicitis. The patient lived with her elderly mother in a large mansion locally called "The Castle." This was approached by a long avenue, which on the other side opened out into a stony promontory on the open sea.

On arrival my first reaction was to the unpleasant smell in this stately home. The second was to the eerie sound in the darkness of mice scuttling all over the place. Going up the elegant staircase I did not touch the balustrade because of bird droppings.

When I had finally finished examining the patient in her bedroom I realised for the first time that we were not alone, but were watched from the top of a large wardrobe by a pair of dark eyes belonging to a very unfriendly owl which was taking in all that was happening. It was then that the patient explained that Owlie was indeed part of the establishment, having been saved from drowning when, with a broken wing, it had been almost carried out to sea. To feed the owl mice had been brought in and kept in a cage, but they soon escaped and in farm-yard language became "free range." The elderly mother and daughter were quite unable to cope with the problem.

The patient did have an acute appendix and was taken away in the back of my car for immediate operation. In her absence the old mother, unable to live alone, invited a nearby neighbour to live with her until her daughter came home. This visitor was a London trained retired physiotherapist and a close friend. On taking her seat at the breakfast table next morning she occupied the daughter's place, and was immediately dive bombed by the owl—and for the 10 days she was there had to wear for her protection an old army tin hat, a wartime relic that was in the house. On the patient's return, still convalescing, the owl was overcome with joy. It brought its finest token of appreciation and deposited a dead mouse on the patient's bare bosom.

The patient, her mother, and the owl are now dead; but the physiotherapist is alive and well, and still likes to tell at her tea parties of the time when she had to wear a soldier's tin hat for breakfast.—SIR IAN FRASER, Belfast.

What are the genetic risks to offspring of a marriage between first cousins?

Precise risk figures are not available for the occurrence of recessive disorders in the offspring of first cousin parents. Indeed, the risks might vary depending on the population in question. It has been argued that where inbreeding has taken place over many generations, the number of recessive genes might have been reduced by the occurrence of severe lethal conditions that preclude procreation and are lost from the population. Most geneticists accept that we, on average, carry one harmful recessive gene and as we share one gene in eight with our first cousins, there is a $1 \text{ in } 8 \times 1 \text{ in } 4 = 1 \text{ in } 32$ risk of having a child with a recessive disorder when first cousins marry. This, roughly 3%, risk should be compared with the 0.3% risk, which is the general population figure for a recessive disorder. Most geneticists would view this as a reasonable risk (the figure is only valid when there is no positive family history), especially as recessive disorders contribute only a small proportion to the load of congenital malformations and disorders of childhood onset.—M BARAITSER, consultant clinical geneticist, London.