as sodium citrate, which need not be given prophylactically. Such policies can be introduced for little cost. Poor use of drugs accounted for five further deaths, two with pancuronium and three with opioids. Three patients died from respiratory failure associated with scoliosis, a dangerous condition in pregnancy.¹⁰ These lives could probably have been saved by negative pressure ventilation during the later stages of pregnancy and after delivery, but this should not be attempted by the inexperienced.

Epidural analgesia features little in the latest published figures but will reappear in the next. Anaesthetists continue to advocate its use: is this empire building or are there good reasons? Many members of the public believe that epidural analgesia increases the need for forceps deliveries and is highly risky. With correct management of the second stage of labour, however, there is no overall increase in the forceps delivery rate,¹¹⁻¹³ and an established epidural service is remarkably safe,¹⁴ though when epidural analgesia is used only occasionally mishaps occur.¹⁵ Even then immediate resuscitation should ensure that death or permanent brain damage do not follow. As anaesthetists may not always be to hand, training resident obstetricians in adult resuscitation should be a high priority.¹⁶

A 24 hour epidural service is not only safer; it makes better use of an anaesthetist's time, giving him a regular role in the maternity unit. Thus he is more likely to be present in an emergency. Moreover, offering epidural analgesia in all high risk labours may reduce the need for dangerous emergency general anaesthesia, and—unlike pethidine—epidural analgesia does not delay gastric emptying. Furthermore, by removing the stress of labour it inhibits adverse metabolic changes in both mother and fetus,¹⁷⁻¹⁹ reduces intrapartum and neonatal death rates in babies born prematurely,²⁰ and in pre-eclampsia produces haemodynamic changes favourable to both mother²¹ and baby.²² It also reduces the likelihood of fits²³ and the requirement for sedation with epileptogenic opioids and phenothiazine derivatives.

A full epidural service is not, however, universally available. In the 1960s campaigning mothers proclaimed the right of every woman to have epidural analgesia, and when bupivacaine arrived at the end of the decade this goal became feasible. Now, though epidural blockade is acknowledged by most consumers to provide the best analgesia,²⁴ few trendy pressure groups campaign for its wider availability.

In summary, I see two priorities for improving obstetric anaesthesia. Firstly, health authorities should appoint consultants trained not only in fashionable management skills but also in obstetric anaesthesia. They can then, without extra cost to their health authorities, establish safe codes of practice and train junior staff and midwives to a high standard. The second area of concern is the small friendly maternity unit. Though it may boast a low perinatal mortality rate, the baby in trouble is commonly transferred before death, either before or after delivery. Pending the invention of a crystal ball enabling midwives to predict complications in labour with accuracy, the small unit remains a liability.

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Can we eradicate hepatitis B?

Most acute infections are caught from chronic carriers. The prevalence of carriers of hepatitis B varies greatly: low in Western Europe and North America, 6-12% in China, but 15-20% in some areas of west Africa and the East. Carriers who are e positive are much more infective, and an infant born to a mother who is an e positive carrier has about a 70% chance of itself becoming a chronic carrier. Virus probably gets squeezed across the placenta during birth and may be detected in cord blood by a sensitive test such as radio-immunoassay. Between 20% and 30% of children who become infected postnatally in the first two or three years of life also become chronic carriers,¹ whereas only 5-10% of infected adults become carriers.

Chronic infection with hepatitis B virus may lead eventually to hepatocellular carcinoma; often in men, rarely in women. This cancer is common in China, in south east and west Africa, and in South African blacks, but much less common in whites. Studies in Taiwan showed that carriers were over 200 times more likely to develop hepatocellular carcinoma than non-carriers.²

A child born to an e negative mother rarely becomes a carrier itself, and a white carrier mother is rarely e positive.³ Nevertheless, neonatal acute hepatitis has been observed in babies born to white carrier mothers who are anti e both in Britain^{4,5} and in the United States.^{6,7} The expression of e antigen seems to be determined genetically; most Chinese carrier women but rather fewer African carrier women are e positive—and so of children born to a Chinese carrier mother between 40% and 70% become carriers,⁸⁻¹¹ to African mothers about 30%; to Asian mothers about 6-8%; and to European mothers almost none.⁸

1 Social Services Committee. *Second report 1979-80. Perinatal and neonatal mortality*. London: HMSO, 1980. (Chairman Mrs Renée Short.)

2 Social Services Committee. *Third report 1983-84. Perinatal and neonatal mortality: follow up*. London: HMSO, 1984. (Chairman Mrs Renée Short.)

Horizontal transmission may be prevented by immunisation, either passive or active. Hepatitis B vaccines prepared from antigen in blood are already on the market. The Merck, Sharp, and Dohme vaccine H-B-Vax has now been licensed in Britain for administration to infants; it has been found to be perfectly safe, and adverse reactions have been rare. Such vaccines have already been widely used to protect infants born to mothers who are carriers of hepatitis B.¹²⁻²⁰ Provided the infants were given their first dose of hepatitis B vaccine at birth, almost all those who would otherwise have become carriers were protected, some schemes and vaccines being more successful than others. Giving hepatitis B immunoglobulin alone often merely delayed the appearance of chronic antigenaemia.²¹⁻²³

The efficacy of vaccine plus immunoglobulin has been compared with that of vaccine alone.^{13 18} One study appeared to find better results with the combined treatment,¹³ but the differences were not statistically significant, and equally good results have been obtained in other studies by vaccine alone.¹² The quality of vaccine is important. An experimental American batch inactivated with formalin alone gave excellent results in a three dose trial in China.¹⁹ A series of four 10 µg doses of H-B-Vax given at birth and at 1 month, 2 months, and 6 months gave an excellent antibody response and a high rate of protection.¹²

Most infants who are infected acquire the infection during birth. Sometimes, however, a high titre of antigen is found in the cord blood, reflecting antenatal infection; attempts to protect such babies with immunoglobulin or vaccine or both have failed.²⁰ So there is probably no hope of protecting every child. Nevertheless, if we could immunise the entire world population and immunise babies born to carrier mothers at birth, the carriers—and cases—ought to disappear in two generations. A useful discussion of the theory underlying the control of infections by vaccination recently appeared in *Nature*.²⁴

Worldwide immunisation is the ideal; but what can and should we be doing now in a cash limited NHS? If we can afford it we screen all mothers and immunise babies of carriers at birth. Next best—and I believe we should get a very good return for our money—would be to screen all mothers of Chinese and African origin, including West Indian, and, if possible, mothers of Asian origin too. The much larger Birmingham study⁸ does not support the contention that babies born to West Indian mothers are not much at risk.²⁵ Hepatitis immune globulin is expensive, and it is in such short supply at present that I do not believe that it ought to be routinely used in addition to the vaccine until someone shows that it improves the results substantially. This has not yet been done.

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Dangers of snuff, both "wet" and "dry"

Around 220 000 kg of snuff is still manufactured each year in Britain. This represents less than 1% of tobacco consumption, but snuff carries no excise duty, and with cigarette smoking in decline attempts are being made to repopularise the habit of snuff taking. There have also been recent attempts to introduce Skoal Bandits (tobacco "teabags") into Britain. Just how dangerous are these alternative ways of taking tobacco?

Russell *et al* measured blood concentrations of nicotine and cotinine in dedicated snuff users and found results comparable with those of smoking a single cigarette.² Absorption from the nasal mucosa was rapid, though the intake was related to the experience of the snuffer. In some ways this rapid absorption is surprising because of the changes within the nasal passages of experienced snuffers. I described these in 1964 and have now examined 63 people who had used commercial snuff for at least 10 years.² All showed generalised atrophy of both middle and inferior turbinates with lumps of snuff lying in the middle meatus. Biopsies showed metaplasia from the usual ciliated columnar to squamous epithelium over a widespread area, but in no case had a malignant neoplasm developed. No history of snuff using was recorded in any of the 265 patients treated for upper jaw malignancy during a 20 year period.

Since nasal snuff is unburnt it contains—in contrast to tobacco smoke—no tar, carbon monoxide, or oxides of nitrogen. Since it is not inhaled it cannot carry a risk of lung cancer, but what is the risk of local damage? Root, Aust, and Sullivan reported the case of a farmer who had placed snuff in the left ear for 42 years, eventually developing a squamous carcinoma of the external auditory meatus.³