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Liver transplantation in children

Earlier referral and better surgical techniques have transformed outlook

The improved outcome after liver transplantation in children, reported by Salt and colleagues in this issue (p 416),¹ results from many advances in management. For instance, better, safer immunosuppression has reduced the incidence of acute rejection, and better preservation solutions now permit extended cold ischaemia without sacrificing organ function. But the most important advances in liver transplantation in children have been in the selection of patients and surgical technique.

A trend towards earlier referral has developed as results with liver replacement have improved. In the past much of the mortality before transplantation was attributable to referrals that were made too late. In the series from Cambridge and King's College Hospital almost one in five children waiting for an organ died before receiving it.¹ Referral for transplantation should be considered if the child has deteriorating hepatic synthetic function (coagulopathy, hyperbilirubinaemia, or hypoalbuminaemia), complications related to portal hypertension (variceal haemorrhage, ascites, or hypersplenism), inborn metabolic defects with risk of irreversible complications (malignancy or neurological or other organ damage), or cholestasis with growth failure despite nutritional treatment.

Biliary atresia continues to be the main indication for liver replacement, the remaining recipients comprising children with cholestatic liver diseases (for example, Alagille's syndrome), inborn errors of metabolism (for example, α_1 -antitrypsin deficiency and Wilson's disease), and a heterogeneous group of other liver diseases. For biliary atresia it has been suggested that liver transplantation should replace Kasai's portoenterostomy operation as the best treatment.²

Proponents of this approach argue that the Kasai procedure increases the technical difficulty, blood loss, and mortality with subsequent transplantation, but this has not been clearly established. In fact, the transplant group from the University of Nebraska found no increase in operative time, blood loss, morbidity, or mortality among children coming to transplantation after Kasai's operation compared with other recipients.³ Additionally, many patients having portoenterostomy for biliary atresia will achieve long term survival and avoid lifelong immunosuppression (about half the patients survive five years; one quarter to one third of patients survive

to adolescence).⁴ Without the Kasai procedure most infants with biliary atresia will not survive beyond the first or second year of life. Donors in this age group are scarce, and survival after liver transplantation in infancy is still lower than in older children.⁵ It seems, therefore, that transplantations should not replace Kasai's operation but rather should be complementary.

Liver transplantation in children differs fundamentally from the operation in adults because of problems with biliary reconstruction. In most children the common bile duct of the recipient is unusable for duct to duct anastomosis because it is either congenitally absent (as in biliary atresia) or too small to accept a T tube. Biliary reconstruction by choledochojejunostomy has greatly reduced the incidence of bile leaks and strictures. The series published today confirms this point: "direct anastomosis of the common bile duct to a Roux loop was associated with fewer complications than the three other types of anastomosis (5% compared with 21-32%)."¹

The most revolutionary technical change in the operation in children has been the widespread use of reduced size donor allografts.^{6,7} Using only portions of the liver expands the pool of potential donors for children. Unfortunately, this technique only "borrows" donors from the adult pool, where the shortage of donors is not quite as acute. It does not increase the overall number of organs unless one organ is divided between two recipients. The penalty for using one donor liver for two recipients is increased complications and reduced survival.⁸ Conversely, living donors (usually parents) may provide a new source of grafts that does not further strain the network of organ distribution. The results in the first 20 children who received liver transplants from living donors at the University of Chicago are similar to those in children who received cadaveric organs.⁹ These new surgical techniques, along with advances in management before and after the operation, promise to improve further the results of liver transplantation in children.

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Fundholding general practices

Early successes—but will they last?

This week sees the publication of a report on the experience of 10 first wave fundholding practices, charting their progress through the preparatory year and the first three months of the scheme.¹ These pioneers took charge of budgets covering practice and prescribing costs and a range of hospital services. They were able to use their leverage to extract advantages in hospital contracts, including shorter waiting times and faster turn around of pathology tests (by switching providers, buying extra sessions, or pressurising local hospitals).

Some cut costs by switching to generic prescribing, reducing referrals, or changing providers. These savings were used to develop practice based services, such as consultant clinics and physiotherapy sessions. In some cases practices pooled resources to pay for the reopening of closed wards in their local hospitals. Despite numerous teething problems the first wave fundholders were enthusiastic about the benefits of the scheme three months on.

Buoyed by this apparent success, the secretary of state has announced the extension of the scheme to smaller practices. Before getting carried away on a tide of euphoria about the benefits of a demand led service it is worth stopping to ponder whether these early advantages can be sustained and to consider the risks inherent in the scheme. So far the major achievements have lain in the improvements in quality that fundholders have extracted from hospitals. The practice based innovations are important too, though none is unique to fundholding: many non-fundholders have developed generic prescribing policies, computerised information systems, specialist clinics, minor surgery sessions, diagnostic facilities, and protocols for shared care.

Though hospitals woke up to fundholding very late in the day, most have shown a new willingness to negotiate with general practitioners. This represents a breakthrough for secondary care, which has often been unresponsive to consumer concerns. Supporters of fundholding argue that district health authorities can never match general practitioners' sensitivity to patients' requirements. Certainly fundholders led the way in negotiating detailed quality specification in their hospital contracts, but many health authorities are now taking considerable pains to determine the views of general practitioners so as to redress the balance.²

Much of the concern about the scheme centres on the extent to which the advantages for the patients of fundholding practices are gained at the expense of those whose practices do not hold budgets, thus increasing inequalities. Glennerster and colleagues argue that improvements may result from improved efficiency, which may benefit all practices.¹ Unfortunately, their study does not include non-fundholding practices, so we shall have to look elsewhere to test this assertion. True or not, it highlights a key political issue, for as long as fundholders remain a small minority of well organised

larger practices, with good facilities mostly in prosperous areas, they will be open to the charge that the scheme channels resources to those areas least in need.

Several large problems remain. One of the most intractable concerns the allocation of budgets. At present budgets are based on past patterns of service use, which is unsatisfactory for several reasons. Firstly, it was extremely difficult to determine the extent of past activity because of inadequate routine data. Secondly, it is now well established that rates of referral and admission vary widely among practices,³ and these variations remain unexplained by conventional measures of need.^{4,5} Budgets allocated to the fledgling fundholders varied by a factor of three, partly for this reason and partly because hospital prices varied widely.⁶ Thirdly, this method of allocating budgets provides an incentive for practices to increase their rates of prescribing and referral in the preparatory year and penalises those practices that are already efficient. The fourth and most worrying problem is that practices may be persuaded to indulge in "cream skimming," whereby patients with expensive health care needs are removed from their lists.⁷

To counteract these problems the Department of Health is anxious to move towards formula based funding, although constructing a satisfactory formula is proving difficult. An important problem concerns the use of private medical care. In the Oxford region referrals to private clinics ranged from less than 5% to more than 50% of practices' total outpatient referrals.⁸ No data are collected on numbers of patients with private health insurance, or on clinical activity in independent hospitals. Unless the formula can take account of these, practices in prosperous areas will continue to have a financial advantage over others.

Other concerns include the potential for abuse arising from the fact that practices have been allowed to establish private companies to enable them to sell and buy services from themselves. When this occurs the competitive advantages of the purchaser-provider split no longer apply. Practices that have established their own locally based services—for example, physiotherapy—dramatically increase their referrals to these facilities. Is this evidence of previously unmet need or of demand induced by suppliers? How can we be sure that patients are receiving the best care? As the American experience shows, preventing abuse will require careful regulation.⁷

The future of fundholding is hard to predict, not least because Labour has pledged to abandon the scheme if it wins the election. The first year of fundholding may not turn out to be typical: whereas fundholders could play the market district purchasers had to keep to historical referral patterns. If health authorities' future purchasing plans closely reflect general practitioners' wishes practices may see little advantage in