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Day-case paediatric surgery: the only choice

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Since January 1989 a policy of day-case surgery has been adopted for suitable paediatric procedures by one firm (MEF) at East Glamorgan Hospital. There have been 184 children treated to date, with an age range of 4 weeks to 13 years.

There were 58 circumcisions, 48 hernias, 35 orchidopexies, 18 hydrocoeles and 25 miscellaneous procedures performed with no significant complications.

All children were given a general anaesthetic, 42 procedures (22%) were performed using endotracheal intubation, the remainder with a facemask.

Postoperative analgesia was provided in most cases by local wound infiltration with bupivacaine 0.25%.

The average length of stay before January 1989 was 3 days and 2 nights for similar cases. Cost analysis shows significant potential financial savings of £105 per patient treated. The implications for future planning are discussed.

"In the light of results obtained at the Glasgow Children's Hospital I have no alternative to the opinion that the treatment of a large number of the cases at present treated indoors constitutes a waste of the resources of a children's hospital or a children's ward. The results obtained in the out-patient department at a little of the cost are equally as good" *(1)*.

This statement was made by Nicoll in 1909 and is as equally valid today as it was then. Many hospitals have now established day-case centres for the treatment of certain surgical cases. East Glamorgan has no such facility, but with the co-operation of the paediatric medical and nursing staff in ensuring the availability of paediatric beds at the hospital on prearranged days, a policy of day-case surgery has been established by one firm (MEF) at the hospital.

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Materials and methods

In the period from January 1989 to October 1990, 184 children were admitted for day-case operations under general anaesthetic, at East Glamorgan Hospital.

Suitability of patients for day-case surgery is established at the initial outpatient visit, following criteria outlined by the Royal College of Surgeons of England *(2)*.

Parents receive clear written instructions explaining the standard routine of the day before the admission day. The availability of beds on the two paediatric wards is ensured by prior agreement with the paediatric staff. The children are nursed throughout the day by the paediatric nursing staff and also by their parents who remain with the children during the day. The children are kept together where possible in the 8-bedded section of the ward.

Provisions are made for parents to use the hospital canteen whilst at the hospital.

The children are admitted to the ward at 8 a.m. having been starved from midnight. The children are clerked on admission by the Surgical House Officer. The children wear their own pyjamas into the theatre suite and these are replaced after surgery.

The patients are placed on the operating list in ascending order of age and are operated on by the consultant surgeon or the registrar under direct supervision. Wounds are closed with subcuticular sutures and waterproof dressings applied.

All the operations are performed in the morning and the children are seen before discharge to ensure that

there are no wound haematomas and that they have passed urine.

Parents are counselled by nursing staff and issued with written advice concerning basic nursing care in the home environment. Instructions to contact the ward and return if they are in any way concerned for the child's well-being after discharge are also passed on. Letters for the district nurse and their general practitioner are given to the parents. The patients are provided with paracetamol elixir or tablets for postoperative analgesia.

An integral part of our team is the district nurse *(3)*; arrangements can be made by the ward staff for her to visit patients 48 h after discharge to inspect wounds and offer advice where needed.

All patients are seen the following week in the out-patient department, and providing there are no complications and that wounds are well healed the patients are discharged.

Anaesthetic procedure

All children are assessed on the ward by the surgical house officer or registrar and routine observations, including temperature, are taken and recorded by the nursing staff.

EMLA® Cream (Astra Pharmaceuticals) is applied to the dorsum of both hands on admission as it will not be apparent which children will be given an intravenous induction and the cream takes 90 min to work. One tube is used per two patients, cutting the cost to about £1.15 per patient. This practice ensures the option of painless intravenous access when desired by the anaesthetist.

Parents are invited to accompany their children into the anaesthetic room. Though no pressure is applied to the parents to take up this option, the majority of parents are happy to accept the invitation.

The children are not premedicated and all children are anaesthetised by the consultant anaesthetist, who may, on occasion, be accompanied by a registrar.

Anaesthesia is normally induced by gentle inhalation or less often with intravenous thiopentone. Intravenous access is not secured before inhalation induction. Anaesthesia is maintained with nitrous oxide plus an inhalation agent. Endotracheal intubation is performed when indicated.

Postoperative analgesia is provided by infiltrating wounds with bupivacaine 0.25% at a dose of 0.5 ml/kg in the case of hernias and orchidopexies, or by dorsal nerve block of the penis in the case of circumcisions; we find that this provides excellent analgesia and we do not employ caudal anaesthesia. Children under the age of 3 months are not given bupivacaine.

Paracetamol is provided for analgesia in the postoperative period and for use at home.

Results

In a 22-month period 184 operations have been performed. The youngest child was 4 weeks old and the eldest child was 15 years old. The age distribution is shown in Fig. 1. Table I is a summary of the various procedures performed. We have included epigastric, umbilical and inguinal hernias under the collective heading of hernias.

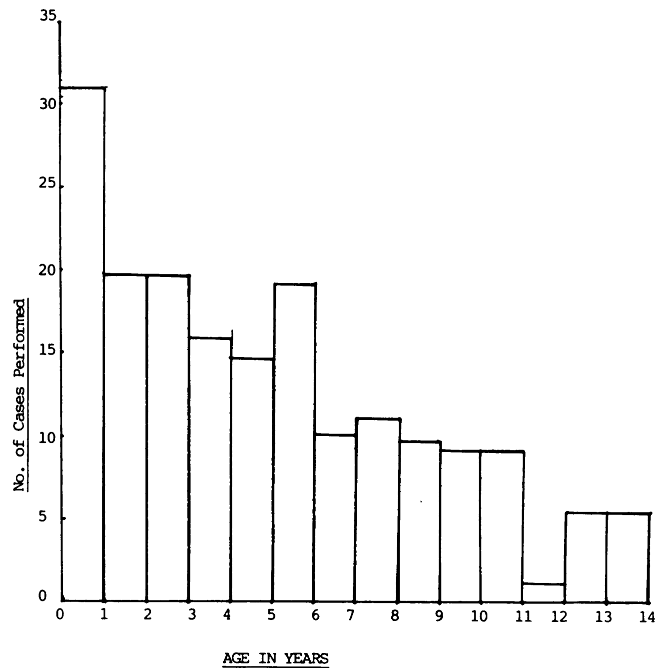

Figure 1. Age distribution of patients.

One child aged 13 weeks had a small scrotal haematoma after a hernia repair, this did not require any further surgery and resolved quickly of its own accord. One child developed a postoperative wound infection after a circumcision; this settled with a short course of antibiotics. Three patients remained in hospital overnight. One for social reasons, one because of a slight rash after the administration of thiopentone and the above patient with the haematoma.

In all, 42 (22%) procedures were performed using endotracheal intubation the remainder were performed using a face mask.

Cost analysis

The Welsh Office recently reviewed figures at Ysbyty Maelor Hospital in Wrexham where there is a day-case

Table I. Procedures performed

Procedure	*No. of patients*
Circumcisions	58
Hernias	48
Orchidopexies	35
Hydrocoeles	18
Miscellaneous	25
Total	184

centre and has shown that the cost of a day-case paediatric procedure is £53.21 compared with £93.44 for an overnight stay in a paediatric bed at the same hospital *(4)*.

The current cost of an overnight paediatric bed at East Glamorgan Hospital is £73.16, using the same formula this would mean the cost of a paediatric day-case at East Glamorgan would be £41.61. Analysis of medical records shows that the average length of stay for similar paediatric cases before January 1989 was 3 days and 2 nights, with some patients (orchidopexies) occasionally staying 6 days.

This would represent a potential financial saving of £105 per patient treated when compared with the length of stay in the hospital before January 1989.

This saving per patient represents an overall potential financial saving of £19 320 in the cases already operated upon.

Discussion

One of the first advocates for outpatient surgery was Nicoll, who in 1909 reported 7320 operations on children, including surgery for cleft lip and palate, spinabifida, pyloric stenosis and hernia *(1)*. He concluded that the success rate of these procedures equalled that of inpatient procedures.

The psychological effects of hospitalisation on children have been studied extensively *(5–7)*. The conclusions drawn from this research were that all children suffered some behavioural problems after periods of hospitalisation and parental separation but children under 4 years old exhibited the greatest effects of this stress.

The best possible situation is for mother and child to be hospitalised together, and clearly day-case surgery provides a reduced psychological stress on the child by a shorter hospitalisation period and minimalised parental–child separation.

The anaesthetic technique used should not be a limiting factor in paediatric day-case surgery. There have been many reports in the literature demonstrating that general endotracheal anaesthesia for short-stay operative procedures has no increased morbidity *(8–10)*. Our experience confirms this with 42 cases (22%) being performed with endotracheal intubation with no morbidity.

Day-case surgery is not new in its concept, there are references to the outpatient management of minor injuries dating back to the Edwin Smith Surgical Papyrus (3000 BC) *(11)*. Significant financial savings have been shown over inpatient management *(12–14)*. The Audit Commission recently reviewed the practice of day-case surgery in four regional health authorities, looking at 20 common procedures deemed suitable for this type of surgery *(15)*. It stated: "If all District Health Services were at or above the upper quartile of the distribution of the percentage as day cases for each of the 20 procedures, about 87 000 existing inpatients in England and Wales could be treated as day cases. Releasing £10m which could be used to treat an extra 98 000 day cases a year".

Day-case surgery has also been shown to be an effective form of management with few complications *(16–18)*, this is due to the following points:

1 Reduced parental–child separation;
2 Reduced hospital cost;
3 Reduced hospital personnel required per patient;
4 Reduced incidence of nosocomial infections.

One could argue, however, that all the savings shown in this paper and in previous papers are in fact theoretical savings and that real savings are not made until wards are shut and actual staffing numbers are reduced. The fact is, that with the arrival of the Government White Paper and the increasing likelihood that hospitals will have to compete for contracts in an open market, figures on which to base those estimates will be calculated by the administrative personnel using current regional health authority statistics, which will include the provision for day-case surgery.

We have demonstrated that potential financial savings at East Glamorgan Hospital amount to £19 320 in the area of day-case paediatric surgery.

It may well be the case in the future that the surgeons who are not providing some form of day-case surgery may find themselves in an increasingly difficult position when asked to demonstrate their cost-effectiveness with regard to the awarding of health authority contracts.

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Assessor's comment

It is encouraging to find that a local district hospital has established day surgery for the routine general surgical operations of childhood. This has obviously required the cooperation of surgeons, paediatricians, anaesthetists and the general practitioners and district nurses. It has been successful with obvious improvements for the child and family. I am not sure from the paper whether the beds are 'borrowed' from the paediatricians or whether the day patients are kept in a separate 'annexe' which is the method of choice. It has taken over 20 years for the advantages of day surgery for children to be recognised and the authors are to be congratulated for their contribution. Surgeons interested in establishing day surgery for children should consult *Just for the day* if good practice is to be achieved.

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