MEDICAL PRACTICE

Hospital Topics

Development and Practice of an Autonomous Minor Surgery Unit in a General Hospital

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In 1954, while on a scholarship tour of the U.S.A., one of us visited a Hospital near Chicago run by Nuns. The nuns who conducted the tour apologized for the noise and disturbance—they were building new operating theatres for their hospital of less than 600 beds, which at the time had only 11 theatres in use.

In 1968 Hammersmith Hospital, with about the same number of surgical beds, still had only four operating theatres, and a large surgical waiting list. Indeed, the plastic surgery list alone represented one-quarter of the total hospital waiting list (of medicine, surgery, and gynaecology), and some form of selective admission had become imperative. By 1970 the waiting list for plastic surgery had been reduced to nearly half of the 1968 figure by providing a minor surgery unit capable of dealing with about one-third of the present waiting list and with the current demand on an outpatient basis.

The present paper details one possible method of controlling current waiting lists. Though this primarily concerns the situation in plastic surgery it may provide help to other disciplines in a similar situation.

Material and Methods

Many hospitals have on site huts or single-storey buildings of varying dimensions, and these become vacant from time to time. In 1967 one such hut was vacated near the front of this hospital and the Board agreed to its reservation for an outpatient surgery

unit (Fig. 1). It was a stressed aluminium Quonset hut 60 by 30 ft (18.3 by 9 m), American Army surplus from the second world war, erected by the Medical Research Council in 1958. It had contained a haematology research unit, and at one time 23 persons worked there. The exterior was in good condition but many of the interior partitions were dilapidated. The main problem was to find the necessary finances for its conversion.

FIG. 1—Exterior view of hut containing minor surgery unit.

A plan was prepared and submitted so that the conversion of the hut to a self-contained autonomous unit would cost about £8,000. The money was to come from maintenance funds. With the help of the hospital engineer the plan was quickly completed and submitted for that year's budget. It was not approved until the following year, and by that time the estimated cost had risen to £13,000, partly owing to inflation and partly

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because it was decided to purchase and erect an air-conditioning unit for the theatre instead of taking this from an available nearby source. A further reason for the increased cost was that the matron insisted on separate male and female toilets in the recovery area because the unit would be dealing with both sexes. In practice there is not often more than one person ambulant in the recovery area at any one time and so nearly £600 could have been saved. Alterations to the interior of the building were kept to the minimum, and for this reason the size of individual rooms is not optimum (Fig. 2). We would appreciate a larger clinical room, which is used for sigmoidoscopies

FIG. 2—Ground plan of accommodation provided.

and the removal of sutures, and more cupboard space. Even so, an autonomous unit with its own operating theatre, recovery area, toilets, office, and changing and waiting rooms was provided for a reasonable capital outlay. Piped oxygen and suction were supplied to the theatre and recovery area, and positive-pressure air conditioning only to the theatre (Figs. 3, 4, and 5).

FIG. 3—Waiting room.

FIG. 4—Operating theatre.

FIG. 5—Recovery area.

Administration and Staffing

It had been decided at the outset that theatre instruments, procedures, and the working week would be standardized. To inform those surgeons who were likely to use the unit a brochure was prepared six months in advance of its opening and circulated widely. An accompanying letter asked for comments, and only a few were received. General practitioners in the area were also informed of what was proposed.

Though it was left to the individual surgeon to decide what type of case he wished to treat in the unit two restrictions were imposed—that all patients should be outpatients, and that the operation should be done under local infiltration anaesthesia. These restrictions were later altered to include operations under brachial or axillary blocks and general anaesthesia of less than one hour's duration.

Patients are normally seen in the outpatient clinic, and if suitable for surgery are given a date and time for this—usually within the next 7-10 days and at mutual convenience. The proposed procedure is explained, a sheet containing directions is given to the patient (Fig. 6), and the consent to operation form is completed. The lower portion of a three-part letter form is then completed and posted to the referring general

practitioner (Fig. 7). The patient's name and complaint are then entered on a master sheet with daily bookings for three or four patients each session. In this way the surgeon can see at a glance which cases are booked for each day, and since he

FIG. 6—Direction sheet given to each patient with the time and date of operation.

Part 3	HAMMERSMITH HOSPITAL Royal Postgraduate Medical School	Du Cane Road London, W.12
Date.....		
Dear Doctor,		
Reference above named patient. The histology report is now to hand, and shows		
Yours sincerely,		
Surgeon		
Part 2	HAMMERSMITH HOSPITAL Royal Postgraduate Medical School	Du Cane Road London, W.12
Date.....		
Dear Doctor,		
Your patient M..... was seen on.....		
when..... was done. He/she will be		
seen again in the Out-patients clinic on.....		
Yours sincerely,		
Surgeon		
Part 1	HAMMERSMITH HOSPITAL Royal Postgraduate Medical School MINOR SURGERY UNIT	Du Cane Road London, W.12
Date.....		
Dear Doctor,		
I saw your patient..... today in the Out-patients		
Department. He/she has.....		
and requires.....		
I have informed the patient, and plan to do this on..... at.....		
under local anaesthesia, as an Out-patient. The procedure is not lengthy, and the patient will		
be able to return home afterwards on the same day.		
I intend to see him/her on..... to.....		
and the patient will be informed.		
Yours sincerely,		
Surgeon		

FIG. 7—Three-part letter (with carbon). The lower portion is completed and sent to the patient's general practitioner when first seen. The middle portion is completed and posted at the time of writing the operation note in the patient's records. The top portion is dispatched when the report of any histological findings is to hand.

will carry sheets for several weeks ahead he can also offer future dates to patients who are unable to attend immediately. There is no waiting list as such. These formalities take only a few minutes to complete, and at the end of the clinic the patient's record can be deposited in the minor surgery unit for later use.

If general anaesthesia is to be used the duty anaesthetist is called to assess the patient's fitness for anaesthesia and a haemoglobin estimation and plain chest x-ray examination are carried out.

The unit functions five days a week from 9 a.m. to 5 p.m. If allowance is made for preparation and daily cleaning two operating sessions of about two-and-a-half hours each day are available. Since the unit closes for the whole of August and at week-ends it can be staffed permanently by maximum part-time nurses. A sister in charge, two staff nurses, one orderly, and one technician are sufficient to run the unit.

Equipment and Instruments

All the theatre supplies are sterilized in a central sterile supply department, which supplies dressing packs for the whole hospital. A small flash autoclave is held in the sterile supply room but it is rarely required (for the dropped instrument or the surgeon's "special" instrument).

The theatre pack is contained on a polypropylene tray with a bowl set, including 2 galley pots, 6 theatre towels (3 by 3 ft; 91 by 91 cm), and the instruments listed below.

Forceps: 1 pair plain McIndoe 6 in (15 cm), 1 pair rat-toothed Lane's 6 in (15 cm), 1 pair toothed Gillies 6 in (15 cm), 6 pairs Kilner's mosquito artery forceps, box joint 5½ in (14 cm), 1 pair Allis tissue forceps 6 in (15 cm). Scalpels: 2 No. 3 handles, Nos. 11, 15, and 10 blades. Two fine Kilner skin hooks. Four towel clips, Frenchay Hospital pattern 3½ in (7.6 cm). Scissors: 1 pair straight fine sharp points, 1 pair curved on flat, 1 pair Gillies needleholder, 1 pair Mayo's 5½ in (14 cm). Retractors: 2 Demarre's retractors—one size B and one size C—2 skin retractors (cat's paw). One mapping pen and nibs. Rule 1-6 in (2.5-15 cm). One Mitchell's trimmer. Ten swabs (4 by 4 in; 10 by 10 cm). Six dressings (3 by 3 in; 7.6 by 7.6 cm).

The total cost per set is £50, and 8-12 sets of instruments are required. The completed tray is wrapped in a cotton towel secured by cord and can be accommodated on a single theatre trolley.

Costs

The capital costs of conversion and equipment are shown in Table I. The maintenance costs are shown in Table II. Since 10 sessions a week are available for operations, or 480 a year (and this is 12,000 operation hours), the cost per session can realistically be shown to be £12.80. The figures given are those of 1969. Since then staff have had two increases in salary, and hence the 1971 figures for comparison should be increased by 60%.

The part-time nursing staff work seven hours a week less than full-time nurses and so are paid proportionately less. They do not contribute to superannuation. Most of them feel that by working Monday to Friday, 9 a.m.-5 p.m., they have in fact done a full week's work; they also have to run a home, do shopping, and find some leisure, and for all this a week-end is

TABLE I—Capital Costs

	£
Conversion of building (including autoclave, air conditioning, plant room, and glove unit)	11,900
Theatre light	220
Linen	500
Instruments (12 sets)	600
Furniture and miscellaneous	400
Total	13,620

TABLE II—Annual Maintenance Costs

Power, light, heating	£	203
Water		36
Building maintenance		60
Laundry materials		100
Linen replacements		125
Staff uniform replacements		50
Towel cabinets		36
Rates		50
Drugs and dressings		500
Total		1,160
Staff salaries { Nursing		2,513
Assistants		2,392
Grand Total		6,065

probably not enough. Even so, this goes some way to explain the low cost of running such a unit. When one remembers that it is possible to carry out palmar fasciectomy for Dupuytren contracture in two patients under brachial block anaesthesia comfortably within a two-and-a-half-hour session, the saving in expense is enormous. We have no idea of the running costs of a main general theatre but suspect it is close to £100 an hour. The saving of £10 a day for a hospital bed should also not be overlooked.

Patients Treated

In the first six months during the rather experimental phase only 260 patients were treated. Local anaesthesia was used in all cases and the conditions were relatively minor. We did expect that the strain on the main operating theatres and on inpatient bed use would be relieved. In practice the total number of operations carried out by the department of surgery has increased steadily in the past two years (having previously remained static for the previous four years).

The sessions are allocated to the different surgical units according to their need (Table III). The work done, however, is not suitable for unsupervised junior staff, for most of these

TABLE III—Allocation of Minor Surgery Sessions 1971

	Monday	Tuesday	Wednesday	Thursday	Friday
A.M.	Varicose veins (G.A.)	Dental (G.A.), orthopaedic (L.A.)	Urology (G.A.)	Paediatric surgery (G.A.)	Rheumatology biopsies (L.A.) etc.
P.M.	General surgery (L.A.)	Plastic (L.A.)	Hand surgery (brachial blocks)	General surgery (L.A.)	Plastic (L.A.)

L.A. = Local anaesthesia only. G.A. = General anaesthesia session.

require instruction in the correct use of local anaesthesia. In the same way junior anaesthetists require instruction in axillary blocks and in general anaesthesia with rapid return to consciousness. Consultants are encouraged to participate by the personal service they receive in the theatre and by the obvious gratitude expressed by the patients. The public reputation of the hospital depends as much on the standards of the minor surgery unit as it does on inpatient care. For this reason alone there must be one consultant in absolute charge who can take full responsibility for the unit.

In the past two years an average of 750 patients annually have been treated, and the type of procedure has gradually increased in magnitude. At present virtually all hand surgery (except artificial joint replacements) is carried out on an outpatient basis. Patients with rheumatoid arthritis particularly appreciate not having to come into hospital when they have all their particular comforts at home.

The ligation and stripping of varicose veins, cystoscopies, circumcisions, and minor paediatric procedures are done under general anaesthesia on a morning list. Patients wake up in bed in the recovery area and can have a meal supplied from a nearby

ward before going home by ambulance in the afternoon. On these occasions the general practitioner is always telephoned before the patient leaves the unit. Skin cancers, moles, scars, biopsies, and simple skin graft or flap reconstructions about the face have all been dealt with without trouble.

Infection and secondary haemorrhage have not occurred, but this may reflect the particular attention to detail by surgeons, who realize that the patient will not be in the hospital for inspection at will. On six occasions patients have been admitted overnight—four patients in whom the procedure lasted longer than expected and two who felt faint and unable to leave after surgery.

Discussion

We have described the design and working of an autonomous unit for surgical procedures carried out on an outpatient basis. It has been in operation for just over two years and is now recognized by both patients and staff as a particularly welcome facility. Having a permanent staff and standardized surgical equipment it has introduced a new concept in outpatient treatment.

The patients are surprised and delighted by lack of waiting for a minor procedure, by the courtesy and attention when welcomed by name in the unit, the comfortable waiting room where a friend or relative can sit, and by the personal friendliness from all the staff. Having an operation has become rather a pleasant outing, and many patients when next attending the hospital make a point of returning to see the unit staff.

The nursing and auxiliary staff appreciate the chance to talk to patients and to see the result of surgery when the patient returns for removal of sutures. They have the opportunity to cement a happy relationship between themselves and patients and are able to reassure those who are nervous or anxious of what is to happen. It should be remembered that if a patient is unhappy or dissatisfied with his reception he can leave quite easily; for a patient in hospital this decision cannot be made or carried out so readily. In practice only one patient of the 1,500 seen has run away before operation, and she returned later full of apologies, which says a great deal for the personal qualities of the staff.

Patients are impressed by the offer of treatment within days of the first consultation, at minimal inconvenience at an appointed time, and with the knowledge that they will be able to leave at a predicted hour. They have perhaps been equally impressed by the personal attention afforded by the nursing staff—being welcomed by name, given a cup of tea or coffee at choice after operation, and allowed to sit with their friends or relatives in surroundings apart from the general bustle of hospital practice. Most return to the same unit for the removal of sutures unless the day for this coincides with a general outpatient clinic, a more convenient method for the surgeon.

The general concept that this form of surgery be more widely practised was laid down in 1967 by Sir George Godber,¹ but no detailed guidance or finance was offered. It was recognized that considerable saving in costs would accrue, but so far as we know there has been no publication showing how great this saving could be. An editorial in the *British Medical Journal*² discussed the cost only of an inpatient bed and recommended a shorter stay as one solution to rising costs. The idea that operating theatre costs could be cut by a factor of 10, as we have shown, was not mentioned.

Old theories die hard. The idea that patients undergoing plastic surgery need spend many weeks in hospital and have multiple operations under general anaesthesia is one such myth. In an affluent society the demand for the removal of minor blemishes is likely to increase. If these can be dealt with quickly and on an outpatient basis then it is possible for surgery to keep pace with modern demand.

Though we have tended to emphasize the financial saving to the Health Service the saving to the general economy should also

be remembered. Many of our patients in executive or general administrative positions have been off work for only half a day after quite extensive hand surgery. Married women have been able to undergo treatment yet able to manage their young children with minimal disturbance to family life. We suspect that many surgeons do not realize the upset that admission to hospital can cause to a whole family, with the breadwinner often having to stay at home, unpaid, to look after the dependants. This applies particularly to the self-employed man who previously avoided necessary treatment because of his difficult business situation.

The fact that 1,500 patients have been treated in this unit without serious mishap reflects the high standards of surgery. The fact that the unit is managed and run entirely by the sister-in-charge (with a consultant as adviser only) and has run so well reflects a new relationship between the nursing staff and doctors which might apply to those special investigative units now required for the practice of modern medicine.

Such a surgical unit appears to work well within a metropolitan area where no great distance of travel is involved, though about 10% of all the patients lived more than 20 miles (32 km) from the hospital. We have not used premedication in any patient and doubt its requirement, and this means that patients can use their own transport, within the physical disability of the operative site; such features are of course discussed at the first interview.

The friends of Hammersmith Hospital provided curtains and a carpet for the waiting room and furniture for the recovery room. We are grateful for their financial assistance.

References

- ¹ Department of Health and Social Security, *On the State of the Public Health: Annual Report of the Chief Medical Officer for the year 1967*, p. 248. London, H.M.S.O., 1967.
- ² *British Medical Journal*, 1971, 1, 127.

For Debate . . .

The Halothane Dilemma: A Case for the Defence

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"Circumstantial evidence is a very tricky thing—it may seem to point very straight to one thing, but if you shift your own point of view a little, you may find it pointing in an equally uncompromising manner to something entirely different."—*The Boscombe Valley Mystery*, Sir Arthur Conan Doyle.

There is still much dispute about whether a clear-cut cause-and-effect relationship between halothane anaesthesia and liver damage has been established. Arguments in favour of the existence of "halothane hepatitis" seem partly to be based on concepts which are sometimes difficult to accept, since they make assumptions about the antigenic features and metabolism of halothane which are not justified by current knowledge.

It is the purpose of this review to make a critical appraisal of the available data and to assess the present situation.

Historical Review

When halothane (Fluothane) was introduced in 1956 it was suggested that its chemical similarity to other halogenated hydrocarbons might make it apt to cause liver damage.^{1,2} This was not borne out by the results of animal experiments^{3,4} or the early clinical trials in man.⁵⁻⁷ Clinical reports of liver damage, however, thought to be due to halothane subsequently appeared in the literature,^{8,9} and these prompted a

number of retrospective surveys of liver dysfunction occurring after anaesthesia and surgery.¹⁰⁻¹²

The largest of these (the United States National Halothane Study)¹⁰ reviewed the incidence of fatal massive hepatic necrosis occurring within six weeks of anaesthesia in some 850,000 patients undergoing surgery in 34 hospitals. About 250,000 of these patients received halothane. Eighty-two cases of fatal massive hepatic necrosis were recorded of which all but nine could be explained on the basis of either the patient's known disease or the surgical procedure or a recognizable postoperative complication. Hence nine cases were attributed to the anaesthetic agent; seven of these nine unexplained cases had received halothane and four of the seven had previously received halothane within six weeks of the final operative procedure. Reports on four of these seven cases, however, had already been published, and two others were known to the participating hospitals before the start of the study. So from this extensive review only one new case of massive hepatic necrosis associated with halothane was elicited. The committee concluded that "unexplained fever and jaundice in a specific patient might reasonably be considered a contraindication to its subsequent use." Later Dykes and Bunker² drew attention to the fact that "there was not a single patient in the National Halothane Study who was jaundiced after the administration of halothane, who died after a second administration, and who was found at necropsy to have suffered massive or intermediate hepatic necrosis."

A statistic from this study concerning the incidence of fatal massive hepatic necrosis attributed to halothane is widely quoted. The overall incidence of massive hepatic necrosis was approximately 1 in 10,000—that is, 82 in 850,000—regardless of the anaesthetic agent used; but in only nine of these patients—of whom seven received halothane—was it felt that massive hepatic necrosis could be attributed to the anaesthetic agent itself. Therefore at worst the true incidence of massive hepatic necrosis associated with halothane in this series was

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