PORTABLE EQUIPMENT FOR INTENSIVE THERAPY

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CERTAIN technical procedures, such as venepuncture, endotracheal intubation and artificial respiration are performed routinely by the anaesthetist. Additionally, he should be in the habit of making rapid assessment of the severely ill patient and instituting supportive therapy, particularly where there may be cardio-vascular or respiratory failure. As a natural consequence anaesthetists are no longer confined only to the anaesthetic room and operation theatre, but may be asked to help in the management of disease throughout hospital practice.

Respiratory obstruction, chest and head injuries, poliomyelitis and similar conditions, barbiturate intoxication, eclampsia, post-operative chest complications and intractable pain are all examples when a move is indicated from the conventional and limited sphere of pure anaesthesia, into the broader field of medicine in its widest sense.

Problem

This expanding role of the anaesthetist is leading to many problems. One is the difficulty to find enough time to see and supervise adequately patients who may be scattered in different wards of a large hospital. Another is that a wide range of equipment may be required at short notice, for cases of differing pathology.

The use of a recovery room has solved the problem concerning the immediate post-operative phase. Here all patients can be nursed together for the first few hours following surgery. And should an untoward incident occur, or extra care be required, then staff and apparatus are instantly available.

In America and Scandinavia this principle of concentration of staff and equipment has been extended to include the management of the severely-ill patients, and intensive-therapy units have been established for this purpose. Of the many obvious advantages of this system that of

particular importance is the availability of apparatus, expert medical and highly-skilled nursing staff where they will be most valuable, instead of being dispersed throughout the hospital.

In Great Britain, at a few centres this ideal has been employed with the formation of special units where all cases of a similar nature are collected. For example, in Oxford, patients with poliomyelitis, polyneuritis, tetanus, myasthenia gravis and porphyria, who require tracheostomy and intermittent positive pressure respiration are nursed together in the Respiration Unit at the Churchill Hospital. But this only represents one aspect of the problem, respiratory failure; and unfortunately in this country where tradition, finance, and other matters play a dominant role, we are not able at present to offer the advantages of an intensive therapy unit to many patients.

However, there is no excuse for allowing a patient, who requires more than the average amount of care and attention, to lie almost unnoticed in the far corner of a ward. And to overcome some of the difficulties, with the concept of concentration in mind, we have made a portable unit for the emergency treatment of the severely ill.

In the past ten months the portable unit has been used on 23 occasions, and some details are included in Table 1.

Description of Portable Intensive Therapy Unit

The equipment, except an underwater seal drain, is housed in a 'Revelation' type of suitcase measuring 70 x 45 x 20 cm., and of total weight 19 kg.

Modifications to the suitcase include:

- (1) A pair of 5 cm. diameter wheels mounted by means of metal plates at one corner, and near the diametrically opposite corner an extra handle attached to the side. This allows the unit to be wheeled at an angle from one location to another.

TABLE I
USES IN CHRONOLOGICAL ORDER OF THE PORTABLE INTENSIVE THERAPY UNIT

Occasion	Location	Patient's Condition	Remarks
1	Casualty department	Barbiturate intoxication	Intubation and ventilation
2	Ward	Fractured jaw	Bronchoscopy
3	Ward	Post-operative chest complication	Toilet of chest
4	Casualty department	Head injury	Pharyngeal toilet
5	Ward	Head injury	Passage of stomach tube
6	Ward	Cerebral abscess	Bronchoscopy, had inhaled food
7	Ward	Peptic ulceration, hæmatemesis	Bronchoscopy
8	Ward	Fractured jaw	Intubation and toilet of chest
9	Ward	Chest injury	Bronchoscopy
10	Anæsthetic room	Chest injury	Relief of tension pneumothorax
11	Operating theatre	Chest injury	Relief of tension pneumothorax
12	Ward	Œsophageal varices, hæmatemesis	Toilet
13	Ward	Head injury	Intubation and toilet of chest
14	X-Ray department	Cerebral tumour	Cardiac massage following thiopentone induction for angiogram
15	Ward	Post-operative chest complication	Toilet of chest and I.V. therapy
16	Ward	Cerebral tumour	Toilet of chest
17	Casualty department	Head injury	Passage of stomach tube
18	Ward	Cerebral tumour	Bronchoscopy, inhaled food
19	Ward	Head injury	Intubation—respiratory obstruction due to palatal odema after angiogram
20	Ward	Post-operative chest complication	Toilet of chest and I.V. therapy
21	Casualty department	Carbon monoxide poisoning	Intubation and ventilation
22	Ward	Cor pulmonale	Change of tracheostomy tube
23	Ward	Tetanus	Intubation, ventilation and curarization

FIG. 1.—The lid showing the diagrams of individual items.

- (2) The expanding mechanism fixed in a permanent position, so as to prevent apparatus in the lid damaging the contents of the base.
- (3) On the hinge side of the base a steel bar bolted parallel to the upper edge to reinforce the side when the case is open.
- (4) A sheet of white painted hardboard with diagrams of the individual items, attached to the lid allows a rapid check that everything is available (see Fig. 1).
- (5) Transparent plastic luncheon boxes fixed to the base hold other items and drugs (the container for Magill endotracheal tubes was made in the Department's workshop). The labels on the under surface of the box lids, other than the drug box, are small so that their contents can be seen.
- (6) Equipment that must be sterilized after use is kept in aluminium containers suitable for autoclaving.
- (7) Various sizes of 'Terry clips' maintain the larger items and containers in position, and specially modified clips retain uneven-shaped apparatus.

The contents of the suitcase are listed in

Table 2, the base is shown in Fig. 2, and a general view of the equipment in Fig. 3. The size of the underwater-seal drainage bottle precludes its inclusion, but it is kept wrapped in a sterile towel beside the case.

Discussion

In the absence of a fully-equipped permanent unit to which a severely-ill patient may be admitted directly this portable equipment has been found to be of value. In the event of an emergency call the suitcase can be collected from a central location, and wheeled immediately to any part of the hospital. No time is wasted in gathering items of equipment required for an individual case, and precious minutes which may be vital for the patient are saved.

Criticism obviously can be levelled at the choice of individual items, but the equipment is intended for use in a busy hospital. The omission of intravenous fluids and a transfusion set was deliberate, as they are always at hand, but modifications could be made profitably under different geographical circumstances. Local flavour favours certain items, for example, the Oxford inflating

FIG. 2.—The contents of the base.

TABLE 2
EQUIPMENT

The Lid:	Syringes, 2 × 2 ml., 2 × 10 ml.	(A)
	Spare batteries + bulbs	
	Tracheostomy tube	(B)
	Bronchoscope	
	Fergusson's mouth gag with Acland jaws, × 2	
	4% lignocaine for topical use	
	Macintosh laryngeal spray	
	Macintosh laryngoscope	
	Bryce-Smith infant's straight blade	
	Mayo tongue forceps	
	Scissors	
	Spencer Wells clip	
	Mitchell intravenous needle × 2	
	Magill intubating forceps	
	Suction catheters	
	Oxford inflating bellows	
The Base:	Elephant corrugated tubing	
	Ruben non-return valve	
	Everseal face masks, sizes 1,2,3	
	Catheter mount	
	Selection of drugs	(C)

The Base—cont.:

Drilled Rowbotham connectors × 5
Water's airways × 3
Stomach tube
Rubber tourniquet
Selection of Magill endotracheal tubes
Gum elastic bougies
Trocar, cannula, catheter + 2 clamps
Clean cotton wool swabs
Sterile surgical spirit
¼% lignocaine with 1/100,000 adrenalin for local infiltration
Thiopentone 0.5 gm, 2 packs
Ambu suction apparatus
Selection of Oxford non-kinking endotracheal tubes
Mitchell endotracheal tube cuff inflator
Pharyngeal pack
Crepe bandage
Adhesive strapping
Hypodermic needles, 1 drawing up, 3 × 25 S.W.G., 2 × 14 S.W.G., 2 × 16 S.W.G.

FIG. 3.—General view of the equipment.

bellows (Macintosh, 1953) is familiar equipment, but an 'Ambu bag' would serve equally well. Both have the merits of simplicity and utilizing air, thus eliminating the need for heavy cylinders.

Summary

The problem of the expanding role of the anaesthetist in medicine is mentioned, and the

principle of intensive therapy considered. Equipment for a portable intensive therapy unit is described, and its use over a ten-month period considered.

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REFERENCE

MACINTOSH, R. R. (1953): Oxford Inflating Bellows, *Brit. med. J.*, ii, 202.