

ASPECTS OF TREATMENT*

Post operative care: the role of the high dependency unit

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Summary

The development of a High Dependency Unit (HDU) which caters for the early postoperative care of patients undergoing major surgery, and for the seriously ill, is described. During its first six months, 320 patients have been treated in the unit, and its initial objectives have been successfully achieved.

Introduction

Most acute hospitals have intensive therapy units (ITU) for the care of the critically ill. These allow a concentration of nursing and medical skills, as well as specialized equipment in areas where they can be most economically and effectively used. In practice, such units tend to be used mainly for those patients requiring assisted ventilation, and those recovering from major cardiovascular and neurosurgical procedures. However, this often results in a depletion of such skills and equipment in general ward areas, and a net reduction of care for those ill patients, who are not considered sufficiently ill to justify transfer to an intensive therapy unit. A good example concerns patients undergoing major surgery, particularly the elderly, who are in special need of constant observation and detailed care during the early postoperative period. Concurrently, modern hospital design with its proliferation of small ward areas, has meant an increasing demand on nurses, particularly at night, in maintaining the level of constant care needed by such patients.

In an attempt to alleviate these deficiencies at the University Hospital of Wales†, we have established a high dependency unit (HDU). We report here our experiences during its first six months of use.

Development

Two preliminary clinical studies were undertaken over a six month period in order to assess the need and to explore what difficulties might arise in regard to operational policies. This experience provided useful information, from which it was decided to establish a seven bedded unit in a ward area originally designed to accommodate eight patients. This site is adjacent to both the emergency surgical admission ward and the ITU, all these areas being on the same floor as the

† The University Hospital of Wales is an 836 bedded Teaching Hospital, accommodating all surgical specialties with the exceptions of accident and plastic surgery. It has a ten bedded Intensive Therapy Unit, and a six bedded Coronary Care Unit. All patients requiring assisted ventilation are normally transferred to the ITU.

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The Editor would welcome any comments on this paper by readers

* Fellows and Members interested in submitting papers for consideration for publication should first write to the Editor

operating theatre suite. During the first three months the unit was open for only five days each week. It is now permanently open.

Estimates of the additional financial implications of this unit have been made and amount approximately to £30 per patient per day.

FACILITIES

Each bed station has piped oxygen and suction, and equipment for continuous monitoring of pulse, ECG and body temperature. Electronically controlled infusion pumps are available for each patient.

At present postoperative pain relief is provided in over 90% of cases by intermittent intravenous administration of narcotic analgesics, usually morphine. The remainder receive either intramuscular injections of narcotic analgesics or some form of nerve blockade, usually continuous epidural analgesia.

NURSING ESTABLISHMENT

The unit is staffed by fully qualified nurses. The establishment of 14.5 whole time equivalents allows a ratio of one nurse to two patients with all nurses sharing the night duties.

OPERATIONAL POLICY

The detailed clinical care of each patient admitted to the HDU remains the direct responsibility of the referring consultant clinician and relevant junior medical staff. Admission of patients is arranged either electively on the day before planned major surgery, or on an emergency basis. Administration of the operational policy is undertaken by a four member panel of consultants who are responsible to the Hospital Medical Staff Committee. These consultants work a weekly rota in order to assist with day to day problems which the sister in charge of the unit might encounter. In order to obtain an objective assessment of patients' suitability for transfer to or from the HDU, an arbitrary scoring system was devised by the sister in charge of the unit (Table I). Experience with this system has shown that patients with a score above 240 needed transfer to the ITU, whereas those with a score less than 130 were usually suitable for conventional ward care.

Patients

During the first six months the HDU admitted 320 patients. 308 of these were postoperative admissions and 12 were medical. The average duration of stay of both postoperative and medical patients was similar, namely 38 and 37 h

TABLE I *Patient dependency score sheet*

		Score	Score on admission to unit	Score on discharge from unit
<i>Admission</i> (Predicted time required in unit).	0-6 hours	30		
	6-18 hours	20		
	18-30 hours	10		
<i>Patients</i>	Neurological	65		
	Tracheostomy	30		
	Facio-maxillary surgery	30		
	Thoracotomy	40		
	Renal failure	85		
	Respiratory disease	40		
	Cardiovascular disease	25		
	Haemorrhage	25		
	Diabetes	25		
	Obesity	15		
<i>Age over 60</i>		15		
<i>Observations:</i>	<i>Vital signs</i>	$\frac{1}{4}$ hourly	20	
		$\frac{1}{2}$ hourly	15	
		1 hourly	10	
		2 hourly	5	
	<i>Arterial observation</i>	$\frac{1}{2}$ hourly	20	
		1 hourly	15	
<i>Cardiac monitoring</i>		20		
<i>Intravenous lines:</i>	2 Lines	10		
	1 Line	5		
	CVP with $\frac{1}{2}$ hourly readings	15		
	1 hourly readings	10		
<i>Arterial line</i>		10		
<i>Drugs</i>	Antibiotic/analgesic IV	15		
	IM	10		
<i>Drainage:</i>	Nasogastric	10		
	Bladder	10		
	Chest	15		
	Abdomen	5		
	Stoma or fistula	15		
<i>Hygiene:</i>	Any of the following scores 30	30		
	Mouth care, pressure care or eye care			
Total				

respectively. The HDU accepted postoperative patients from most surgical specialities (Table II). Three per cent of all patients were later transferred to the ITU because they required assisted ventilation; 3% died in the HDU and 94% were returned to their original wards following clinical improvement and reduced nursing dependency.

Discussion

We regard the development of a high dependency unit as a natural development in the evolution of progressive patient care, particularly in regard to the various surgical specialities. The emergence of the theatre recovery units and ITUs are integral parts of this evolution. However, in many acute general hospitals, there is frequently a hiatus of clinical care between such intensive care areas and the ordinary ward areas, which can be closed by the development of high dependency areas for selected high risk patients. Certainly, our own experience has convinced both ourselves, as well as the hospital medical and nursing staff, of the efficacy of this

TABLE II *Summary of patients cared for in the HDU over 6 months*

	Patients No.	%	Mean age (Yrs)	Average stay (Hours)
General surgery	217	67.8	63	42
Vascular surgery	38	11.9	65	38
Acute medicine	12	3.7	54	37
ENT/facio-maxillary surgery	22	6.9	46	40
Orthopaedics	22	6.9	29	28
Urology and gynaecology	9	2.8	68	21
Total	320	100		

approach. The unit has rapidly proved itself capable of coping with the special problems associated with diverse surgical and medical specialities. Also, patients and their relatives have been favourably impressed by the constancy of

care that is available during the critical stage of illness or postoperative recovery. The concentration of nursing staff and moment to moment observation of patients' cardio-respiratory state has allowed postoperative pain relief to be managed on an individual basis, under close supervision.

Although the introduction of an HDU results in additional hospital costs, this should be balanced against the need to provide special nurses in ordinary ward areas, or the transfer of patients to the very expensive ITU.

The establishment of a high dependency unit provides a

high level of nursing and medical care for patients who particularly require it and this should be reflected in enhanced safety (1), reduction in postoperative complications and much better postoperative pain relief (2).

References

- 1 Spence AA. Uses of anaesthesia: postoperative care. *Br Med J* 1980;281:367-8.
- 2 Boulton TB. Editorial. *Anaesthesia* 1982;37:627-8.

Notes on books

The Craniosynostoses by D J David, Daniel Poswillo and Donald Simpson. 331 pages, illustrated. Springer Verlag, Berlin. DM 91.80.

The authors from Adelaide and London describe first the causes and effects of premature fusion of cranial sutures. The second part deals with symptoms and strategies. The third part deals with the various types, management, results, and psychological aspects. In the appendix is discussed the organisation of a craniofacial unit, based on the South Australian Unit, and a list of syndromes. The book ends with a reference list.

The Brittle Bone Syndrome by Roger Smith, M J O Francis and G R Houghton. 218 pages, illustrated. Butterworths, Sevenoaks. £30.00.

The authors, from Oxford, survey various aspects of osteogenesis imperfecta including pathology, biochemistry, genetics, diagnosis, and treatment. The last chapter reviews recent advances. The appendix lists organisations interested in the problem and the book ends with a full reference list.

Enteral and Parenteral Nutrition by Andrew Grant and Elizabeth Todd. 175 pages. Paperback. Blackwell, Oxford. £4.80.

A great advance in surgical treatment is the ability to provide nutritional support especially in liver and renal disease, cancer and burns. Contributors deal with the basic nutritional background, techniques of administration, monitoring and complications. There is an excellent and useful appendix on desirable weights, constituents of infusion solutions, caloric and protein values of common foods and manufacturers' addresses.

Surgery of the Alimentary Tract: Colon and Anorectal Tract by R T Shaekelford and G D Zuidema. 705 pages, illustrated. Second Edition. Saunders, London. £49.00.

This text retains the format of the first edition as regards presentation of embryology, physiology, anatomy, surgical diseases, and technical aspects. It offers a detailed account with line drawings and photographs. There are references at the end of each chapter.

Vascular Radionuclide Imaging by J T Ennis and D J Dowsett. 239 pages, illustrated. John Wiley & Sons, Chichester. £44.50.

The authors from Dublin point out the advantages and techniques of radionuclide imaging. Organ-specific isotopes allow function to be studied in various circulations without the risks of arteriography. This is a timely review of a rapidly developing subject, especially important in view of the high incidence of vascular disease in modern Western Society.

A Colour Atlas of Upper Gastrointestinal Surgery by C G Clark. 168 pages, illustrated. Wolfe Medical, London. £50.00.

Professor Charles Clark has displayed with beautiful colour photographs and short germane comments a number of upper gastrointestinal operations. Most of the gastric operations carried out routinely or as conversions following unsatisfactory primary operation are displayed. In addition hiatal hernia repair, intragastric drainage of a pancreatic pseudocyst and jejunoileal bypass are described. The descriptions, illustrations, and production are in keeping with the high standard set in previous books in this series.

Colorectal Disease edited by J P S Thomson, R J Nicholls and C B Williams. 381 pages, illustrated. Heinemann, London. £22.50.

This clearly written, well illustrated book is aimed at general physicians and surgeons who see patients with colorectal conditions. It emanates of course from St Mark's Hospital. It is divided into sections on investigation, function, principles of surgical management, complications, and trauma. Later chapters deal with inflammatory bowel disease, neoplasms, vascular disorders, and paediatric problems. The penultimate chapter is devoted to the very important problems of anal and perianal disorders. Finally there is a chapter on sexually transmitted diseases.

Manual of Preoperative and Postoperative Care. American College of Surgeons. 822 pages, illustrated. Saunders, London. £27.25.

A number of changes have been made in this third edition of a well established book. In particular surgical nutrition, problems in infants and children and preoperative preparation for anaesthesia are given in greater detail. Multiple systems failure, urology, neurological dysfunctions, the cancer patient, the extremities, and physiological support systems are expanded. The book is divided into four sections on the Basics, Paediatrics, Organ Systems, and Special Patient Problems.

Craniofacial Surgery for Craniosynostosis by Daniel Marchac and Dominique Renier. 201 pages, illustrated. Little, Brown & Co, Boston. \$00.00.

The authors from Paris are a plastic and a neurosurgeon. They present the results of treating 208 patients followed for 1 to 9 years. In the first part they classify and evaluate the functional aspects and assessment. Thereafter they review the surgery and general care. Subsequent chapters are devoted to particular syndromes. The last part of the book deals with indications, complications and secondary repairs. The book is lavishly illustrated.