Middle Articles

HOSPITAL TOPICS

Children in Adult Intensive Therapy Units

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Summary: From experience in the Northampton/Kettering area 9 to 10% of all patients in a general hospital requiring care in an intensive therapy unit were aged 12 years or under. Fifty-nine children were admitted to the intensive therapy unit of Northampton General Hospital between May 1967 and August 1969. Of these, 22 had been injured in road traffic accidents, five were surgical emergencies, five had meningitis, four status epilepticus, and four respiratory infections.

All of the 30 families interviewed were in favour of their child being admitted to the unit, and none considered that the experience had had any lasting adverse psychological effect on the child. It is suggested that certain carefully selected child patients do benefit from the facilities of an intensive therapy unit, and for this reason such units must be designed, equipped, and staffed with this in mind.

Introduction

One of the most striking features of hospital practice during the past decade has been the introduction and evolution of the intensive therapy unit into the district general hospital (British Medical Association Planning unit, 1967). Several pressures have combined to create a need for these units, the increasing complexity of medical care and a shortage of trained nursing staff being among them. According to definition there are at present about 100 units in the United Kingdom (G. Ford, personal communication, 1969), most of them being in hospitals which admit children. In most instances the introduction of these units has been a great success and has led to an improvement in care for the critically ill patient, particularly in provincial hospitals, and a lessening of the strain on the over-taxed nursing staff in general wards (Crockett and Barr, 1965).

The question of caring for young children and infants in these units has not yet been considered in any great detail. This is perhaps surprising, as the same decade that has seen the introduction of the intensive therapy unit into the general hospital has also seen a new emphasis placed on the provision of a suitable environment for children in hospital (Ministry of Health, Platt Report, 1959). Points given particular attention in this report and others include the desirability of not admitting children to adult wards, the introduction of free visiting, and the admission of some mothers with their children (Joseph and MacKeith, 1966). The problem of children being admitted to an intensive therapy unit, which has been basically designed for adults is mainly one which confronts the district general hospital, as in a children's hospital the unit can be entirely paediatric both in equipment and in outlook (Rees *et al.*, 1966). As most children are cared for in district general hospitals, the

problem of the child patient in the "adult intensive therapy unit" seems likely to become numerically larger as more general hospitals open these units and as an increasing shortage of nursing staff demands the concentration of all critically ill patients in one area of the hospital.

This study of children admitted to the intensive therapy unit at Northampton General Hospital was therefore made with a view to learning more about the types of illness requiring admission, the techniques in medical and nursing care especially appropriate to the unit, and the results as seen by parents, children, and nurses.

The Hospital and Patients

Northampton General Hospital, which is a district hospital of 582 beds and serves a population of 300,000, is the main accident centre for the area. It also admits most of the acute paediatric cases, both medical and surgical.

An intensive therapy unit of five beds was opened in May 1967 and is under the general supervision of a consultant anaesthetist, though individual consultants continue to look after their own patients. The decision to admit a child is normally taken after consultation between the consultant in charge of the case and the consultant anaesthetist on duty. The day-to-day care of the patient is then shared between the admitting firm and the anaesthetists. One of the five beds is in a cubicle which can be closed off for infectious cases and may at times, though not always, be used for children. Adequate screening of all the beds is possible and the general environment is bright and cheerful.

During the period from May 1967 to August 1969 680 patients of all ages were admitted to the unit. Of these, 59 were children of 12 years or under constituted 8.7% of all admissions to the unit. The total number of acute admissions of children under the age of 12 years (excluding E.N.T. and ophthalmic admissions) was 4,738 of which 1.2% therefore required care in the unit. The corresponding figure for the total number of admissions of all ages to the four-bedded unit at Kettering General hospital in the adjacent clinical area over the same period was 818, of which 79 (9.7%) were children; the total number of acute child admissions was 3,472, of which 2.3% required care in the unit. Half of the children in the Northampton series were under 5 years of age and 11 were less than 1 (Table I). Surgical and orthopaedic cases tended to stay longer than medical ones, the average stay on the unit being a little over four days (Table II).

The data relating to the 59 children passing through the Northampton unit have been reviewed and an attempt has been made to recall as many parents and children as possible for interview and completion of a questionnaire. The parents of the children who died, however, were not asked to attend for interview. In these instances a letter was sent to the family doctor requesting any information that might be available.

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TABLE I.—*Admissions by Age to Intensive Therapy Unit at Northampton General Hospital. Corresponding Figures at Kettering General Hospital are Shown in Parentheses*

Age in Years	No. of Cases		Total
	Medical	Surgical	
Under 1	10	1	11 (14)
1	3	3	6 (5)
2	4	2	6 (7)
3	1	4	5 (7)
4	0	3	3 (5)
5	0	3	3 (9)
6	2	1	3 (5)
7	0	2	2 (7)
8	2	5	7 (8)
9	0	3	3 (6)
10	0	5	5 (4)
11	1	0	1 (2)
12	1	3	4
Total	24	35	59 (79)

TABLE II.—*Length of Stay in Intensive Therapy Unit at Northampton General Hospital*

Length of Stay in Days	No. of Cases		Total
	Medical	Surgical	
1	11	14	25
2	5	7	12
3	3	3	6
4	3	2	5
5	0	2	2
6	2	0	2
9	0	1	1
13	0	1	1
17	0	1	1
18	0	1	1
19	0	1	1
24	0	1	1
26	0	1	1
Total	24	35	59

Clinical Details

The series has been divided, in rather an arbitrary manner, into "medical" and "surgical" cases, according to the specialty of the consultant in charge of the case. Most of the cases admitted or transferred to the unit were either existing or potential respiratory emergencies, with or without depression of the level of consciousness. The largest single group of children admitted to the unit were those with multiple injuries from road traffic accidents (see Table III). Of the total

TABLE III.—*Details of Diagnoses*

Medical (24 cases)		Surgical (35 cases)	
Meningitis	5	Road traffic accident	22
Status epilepticus	4	(multiple injuries)	
Respiratory infections	4	Accidents other than road traffic	
Inhalation of vomit	2	accident	6
Hypothermia and exposure	2	Other surgical emergencies	5
Tetanus	1	Postoperative cases	2
Chronic renal failure	1		
Rheumatic pericarditis	1		
Haemolytic uraemic syndrome	1		
Severe electrolyte imbalance	1		
Subarachnoid haemorrhage	1		
Cavernous sinus thrombosis	1		
(orbital cellulitis)	1		

of 22 children in this category all had head injuries, often in addition to abdominal or other injuries, 9 were admitted primarily for observation of level of consciousness, and 13 needed active treatment as part of their management. As might be expected four of the five deaths in the surgical category resulted from severe road accident injuries. Of the two children admitted for postoperative care one, a child of 2, had had an extensive renal neoplasm removed, and the other, a boy of 6, had developed ileus after a perforated appendix.

Convulsions were a common cause of medical admissions, status epilepticus in the young child always being a difficult emergency to manage successfully because of its attendant airway problems and the danger of inhalation of vomit. Three of the four children admitted in status epilepticus had additional complicating features; a baby of 7 months had cerebral thrombosis, a child of 2 years had inhaled vomit, and a child

of 10 had Sturge-Weber syndrome. Meningitis was another common cause of admission. Again only complicated cases required care in the unit—a girl of 10 with leukaemic meningitis and delirium, a boy of 2 with meningococcal septicaemia, and a child of 18 months with a severe pneumococcal meningitis complicated by respiratory arrest. Descending respiratory infections of the bronchiolitis type were responsible for the admission of four children aged between 4 months and 2 years. Such patients may rapidly develop respiratory failure and require assisted respiration.

Intermittent positive-pressure ventilation was required in nine cases (Table IV). Of the four children with severe head

TABLE IV.—*Analysis of Procedures in 33 of the 59 Cases*

Positive-pressure ventilation	9
Tracheostomy or prolonged nasotracheal intubation	12
Bronchoscopy	6
Other (cardiac or thermal monitoring, etc.)	6

injuries two survived, while of the five medical patients requiring intermittent positive-pressure ventilation none survived. (Table V). The outcome of these cases reflects the

TABLE V.—*Outcome of Admissions and Analysis of Deaths in 59 Cases*

Full recovery	39
Partial " "	9
Death:	
Surgical cases:	
Road traffic accident	4
Undetected volvulus	1
Medical cases:	
Age 7 months. Status epilepticus, cerebral thrombosis	1
" 5 months. Acute bronchiolitis	1
" 2 years. Status epilepticus, inhalation of vomit	1
" 34 months. Pneumococcal meningitis, respiratory failure	1
" 16 months. Haemolytic uraemic syndrome	1
" 10 years. Subarachnoid haemorrhage	1

severity of their illness or injuries, and the mortality of 18.7% (11 out of 59) is certainly no higher than in comparable adult series.

Attitudes of Parents, Staff, and Children

Recall of patients and parents for interview proved difficult, as many families lived some distance away or failed to respond to a request for information. The 30 families who were interviewed, however, were in favour of their child being admitted to the unit, and in no instance would they have preferred their child not have been (Table VI). Comments by

TABLE VI.—*Attitude of Parents Towards Child's Admission to Unit (59 Cases)*

Unqualified approval	21
Qualified approval	7
No comment	2
Active disapproval	0
Not reviewed (including 11 deaths)	29

parents were interesting and varied. Many experienced a "sinking of the heart" when first confronted by the rather daunting apparatus in the unit, whereas the children did not seem disturbed by it and seemed to accept it without question. The high ratio of medical and nursing staff was universally approved, as were the flexible arrangements for visits and inquiries. The provision of more toys, occupational therapy, and television were all mentioned as possible improvements, and one mother felt that "piped" music would be of value. All parents accepted the necessity for admission of their child to a unit which involved mixing ages and sexes, though a few were anxious about "what he would see when he woke up." All the parents expected early transfer to the children's ward as soon as the child was over the critical phase of his illness.

Relatively few children had any pertinent comment to make about their stay in the unit. On the whole they had difficulty in remembering their time spent in the unit as being separate from the rest of their stay in the children's ward. Some were, of course, too young to make any useful comment. No parent felt that the time spent in the unit had had any lasting ad-

verse psychological effect on the child over and above that which might have resulted from the accident itself or admission to the hospital in general. This was also our impression on reviewing these children, though it was not possible to arrange a formal psychiatric assessment.

Of the few children with any clear recollection of their time in the unit, only one made any really disquieting comment regarding his stay. This was an intelligent 6-year-old boy who had been admitted with acute rheumatic pericarditis. He was fully conscious throughout his three days in the unit, and in retrospect should probably never have been nursed there at all. He undoubtedly saw and heard more of acute illness in adults than was desirable, despite apparently adequate screening. Another boy saw a respirator in use on an adult patient, but he "knew it was not for him" and therefore was not at all alarmed by it.

Five replies were received to letters sent to the family doctors of the patients who died. In each case the doctor felt that the exceptional facilities offered by the unit alleviated to some extent the distress felt by the parents at the loss of their child. They felt, however, that it would be unwise to discuss the matter directly with the parents.

Reactions of Nursing Staff

Children's Ward

The children's ward contains 36 beds and is staffed by one sister, two staff nurses, and eight other nurses. All the regular day staff were interviewed and their opinions can be divided broadly into two groups. On the whole the three senior nurses regretted the need for transferring children to the intensive therapy unit, though they accepted that on occasions staffing difficulties made this inevitable. The more junior nurses regretted the necessity less, and in some cases were openly relieved that the children were transferred. The difficulty of providing adequate staff at night was constantly referred to, and was often given as the main justification for transferring the children to the unit. All the nurses on the children's ward felt that ideally very ill children should be nursed on a children's ward if only staffing could be strengthened sufficiently. They also felt that these children presented a challenge to the staff which should not be lightly delegated elsewhere.

Opinion varied regarding whether morale was affected by transferring acutely ill children to the unit, but it was pointed out that that morale could also be adversely affected by an overwhelmingly heavy work-load. Seven of the 11 nurses thought that transferring cases to the unit had a detrimental effect to some extent on the training facilities offered on the children's ward as this lessened their experience with the critically ill child.

The term "I.T.U.itis," a new term to us, was well known to the more senior children's ward nurses. It applies to the rather overdemanding mental attitude of patients returned to the ward after they have enjoyed the one-to-one nurse-patient relationship in the unit. This phenomenon, however, is not confined to children and is also well known to the staff in the unit. Several nurses commented on the difficulty in re-establishing a relationship with a child after his return from the unit, and they felt that they might have to overcome an unconscious resentment that the child had been nursed through a critical phase of his illness elsewhere. Most of the nurses had visited the children after their transfer from the ward to the unit, though some of the junior nurses were rather diffident about this.

Intensive Therapy Unit

The unit is staffed by two sisters, four staff nurses and seven other nurses, many of whom are part-time. Both the sisters welcomed the chance to nurse a child occasionally in the unit, as this was both rewarding and a change from the

older patients usually admitted. All the nurses enjoyed having children in the unit except one, who thought that they did not fit easily into the routine. Eight of the 13 nurses were apprehensive about the care of small infants, and a typical comment was "they are so little." Anxieties about intravenous drips "going too fast" were also common. On the other hand, nurses from large families, or with children of their own were more confident in this respect. It was generally considered that the unit could offer small children a high nurse/patient ratio (about 1:1), all the necessary apparatus, and immediate medical attention.

Nine of the 13 nurses considered the environment of the unit to be basically unsuitable for children, while all of them thought that despite screening the children did on occasion see and hear more than was desirable. Nevertheless, unpleasant sights and sound do also occur on children's wards. Only two of the nurses thought the patients stayed in the unit for an undue length of time. All the nurses in the unit felt that there were undoubtedly occasions under the present staffing conditions when admission to the unit was essential for providing the child with the best care of which the hospital was capable.

Discussion

Most serious illnesses in children can and should be managed on a children's ward. There are, however, occasions in a general hospital when the nature of the illness, requiring particularly intensive nursing care and the use of special apparatus, justifies transfer to the intensive therapy unit. Furthermore, the difficulty of maintaining a large number of nurses on the children's ward is intensified at night. Often two student nurses may have to look after 36 children—including as many as 14 babies—with very little help and with supervision from only an itinerant night sister. On the other hand, the intensive therapy unit will normally have a night staff of three trained nurses to care for a maximum of five patients, so that the progress of a critically ill child can be kept under much closer observation. No specific provision is made to alter the staff when a child is in the unit, though, in fact, by chance the unit staff does include two part-time trained children's nurses, one on day duty and one on night duty.

If children are to be admitted to an intensive therapy unit, provision for nursing children should be made when the unit is planned. Though no specific provision was made for children in the unit at Northampton, this is so flexible that children can be cared for satisfactorily with the existing facilities. Though parents approve of their children being admitted to such a unit, it may well be desirable to provide a cubicle or cubicles especially for children when a unit of this type is designed. Suggestions for occupying the children during the day-time should also be considered. Where a play-leader is already available in the hospital she could visit the child in the unit, with great benefit. Paediatric equipment should include an infant bronchoscope, facilities for intermittent positive-pressure ventilation in small children and infants, suitable oxygen tents, and intravenous equipment. Incubators are normally borrowed or hired as required, since they are in use only infrequently.

As yet no newborn babies with respiratory diseases have been nursed in the unit, as these babies require the basic nursing skills of the premature and special-care baby unit. On the other hand, as the use of ventilators for the newborn with respiratory distress becomes more practicable in regional units, it may be argued that these babies should be nursed where specialist anaesthetic and special-care facilities exist, particularly if, as at Northampton, the general hospital intensive therapy unit and the premature baby unit are in the same complex of buildings. Whether the general hospital of the future will be able to operate respirators efficiently in two separate areas of the same hospital, however different the ages of the patients concerned, has to be considered.

We thank the consultants at the Northampton and Kettering General Hospitals under whom the patients were admitted for permitting us to recall them for review; Dr. A. Lodge and other members of the division of anaesthesia at Northampton General Hospital for helpful advice and assistance; the sisters and nursing staff of the units at Northampton and Kettering General Hospitals for expert care of patients of all ages; Dr. G. S. Crockett, consultant in charge of the unit at Kettering General Hospital; and Mr. Redmond for assistance with the tables.

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UNHEARD VOICES

The Ophthalmologist

[FROM A SPECIAL CORRESPONDENT]

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Mr. Gillivan told me he had decided to live in Scotland after ten years spent in the permanent traffic jam of south-east England. Now his territory extended over 1,000 sq. miles of some of the most attractive country in Europe. He covered about 15,000 miles a year on N.H.S. business—and observed gloomily that the mileage allowance fell sharply after the first 6,000. Gillivan enjoyed driving along empty country roads, but, he said, "I fit snow tyres each winter as routine at my own expense—how many English consultants need do that?"

Geographical Problems

Despite having given a lot of thought to the problems of a remote rural area such as his, Gillivan saw no easy solution. "Is it right that I should drive 60 miles every week to do an outpatient clinic in an old army hut with a leaking roof—carrying most of my equipment in the back of the car—or should we expect the 20 or so patients I see to travel to a modern unit in the county town?" He reminded me that most patients with eye disease are elderly, and often they were unwilling or unable to undertake long journeys by public transport. On the other hand, to send the patients by ambulance meant either hours waiting about or fleets of ambulances. Some sort of compromise was needed—but at present the system was quite illogical. "Two of the clinics I attend are six miles apart," he told me. "Surely one of these could be closed down."

Apart from school clinics Gillivan visited five other hospitals. Only one of these was really satisfactory for the practice of modern ophthalmic surgery—and clearly the prospects of upgrading all the others were poor. Some time in the future two new district general hospitals were to be built in his area "but every time the *Hospital Plan* is revised the date recedes farther into the future," observed Gillivan. "In Scotland the medical schools are not financed separately from the regions, and we believe that our chances of getting any worthwhile improvements are remote. We are too far down the queue."

The scattered nature of his sessions had other disadvantages. He and two other consultants shared one registrar and one houseman, both of whom worked at the hospital in the county town, as did the medical assistant in ophthalmology. This meant that the operations done at Castlebridge, 15 miles away, were often done without junior staff to assist—and there was no resident at the hospital with ophthalmic knowledge should postoperative complications develop. "I may be 30 miles away the next day," said Gillivan, "so this markedly limits the types of operation I can do at Castlebridge—but the waiting list at

the county hospital in Barchester is already six months." Another effect of his scattered sessions was that much of the work he did was sub-consultant in type. Gillivan was the most recently appointed consultant and in general he did more routine work than his colleagues—the senior consultant saw most of the new cases and distributed many of them among his junior colleagues for treatment or follow-up. "We are moving in the direction of a divisional system," said Gillivan, "with one of us concentrating on glaucoma, another on corneal diseases, and so on—but we can make little sense of such a system until the work is rationalized into fewer, bigger units, and the mass of routine work is taken off our hands." Ophthalmology was an ideal subject for the use of medical assistants, he went on, and if only more posts were created the quality of the consultant work could be improved.

In this relatively remote area it was not easy to attract good junior staff. It was some years since he had had a U.K. graduate as his ophthalmic registrar. "Often I am doubtful about letting the registrar run the clinics during my holidays," said Gillivan, "and on balance I consider it best to cancel the outpatient sessions until I return from my vacation." During the summer period, in fact, the whole practice ran at half-cock; he often had to cancel a list because no anaesthetist was available. The establishment of anaesthetists was filled, but it was adequate only so long as no one was sick or on holiday—another example of cutting costs to the minimum.

Effects of Delay

The pressure on beds and on operating time meant that the waiting lists were long. Gillivan was passionately concerned about the effects of such delays on the quality of the work done in the area. "Time and again we find that a child with a squint is being treated by the orthoptist and reaches the point at which operation is needed, only for us to have to postpone surgery for months because no bed is available. The orthoptist wastes time keeping the child under treatment, and in the end the result is less than ideal because the operation was done too late."

Gillivan did three school clinics a week—in very poor accommodation. "Ophthalmic examination must be done in darkness," he explained, "and unless the clinic is held in a room designed for the purpose darkness usually means total lack of ventilation." Often he had to work in what was virtually a cupboard. In this field it was easy to see how the tripartite nature of the N.H.S. often led to infuriating wastage of effort. Not uncommonly he would examine a child at the request of the school medical officer only to find that one of his colleagues had already made an assessment at a hospital outpatient session a week or two before, and neither the patient nor the general