CONTEMPORARY THEMES

Memorandum on the Management of Accidents in Childhood*

Prepared by the Standing Committee on Accidents in Childhood of the British Paediatric Association

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Children are more liable to accidents than adults because they are immature physically and mentally, lack experience, and are unable to foresee danger and the possible consequences of their actions. Hitherto there has been too little recognition of the facts that children are injured in large numbers, that their injuries differ from those of adults, and that they have special needs related to age and development. The consideration of special provision for children is important now that so much thought, time, and money are being devoted to the planning of hospitals and to the organization of accident and emergency services.

Review of Present Situation

Mortality

Nearly 10% of all accidental deaths in males and 7% of those in females occur in children under the age of 15.† The main causes in the first year are recorded by the Registrar General as inhalation of food, etc., and suffocation, though some of these "cot deaths" may be infective or allergic in origin.

As the toddler begins to explore his environment other causes of death increase in importance: drowning, poisoning, burns and scalds, falls, and traffic accidents. Accidents are the commonest single cause of death among schoolchildren; in 1963 40% (612) of the 1,528 deaths in boys aged between 5 and 15 in England and Wales were due to accidents. The corresponding percentage in girls was 24.7% (224 deaths out of a total of 909).

Morbidity

Rowntree (1950) estimated that about 35,000 injuries in children under 2 years of age were treated annually in the United Kingdom—3,000 by admission to hospital, 11,000 in accident and casualty departments, and 21,000 by family doctors. Children under 15 years of age constituted 22% of patients attending "casualty" departments in England and Wales in one sample week (Platt Committee's Report on Accident and Emergency Services, 1962, Appendix II, Table III).

In Liverpool about 2,000 children (approximately 1% of the childhood population) are admitted to children's hospitals each year as a result of accidents; 1,200 go to surgical wards (over a quarter of all admissions to these wards) and 600 to orthopaedic wards (half of the total admissions to these wards) (Forshall, personal communication).

In 1959 10,907 children and 69,765 adults were seriously injured in road accidents (Interim Report of Accident Services Review Committee, Osmond-Clarke Committee, 1961, Appendix I, Table IV).

Of all poisonings (other than barbiturate), 43% in males occur in boys under 5 years of age, while 53% of all burns in females and 48% of all burns in males occur in children (Hospital In-patient Enquiry for 1959, quoted in Platt Committee's Report on Accident and Emergency Services, 1962, Appendix III, Table III).

A high proportion of accidents involve very young children. According to the British Medical Association's Report on Accidents in the Home (1964), 40% of all home accidents occur in those under 5 years of age: accidents to boys aged 1 and 2 years make up 22% of all reported accidents to males. Of home accidents in Aberdeen, more than half were among children below school-leaving age, though children composed less than one-quarter of the population (MacQueen, 1960).

It should be noted that not all injuries to young children are accidental. Deliberate, serious, and often fatal injury to children by adults seems to be more common than formerly (*Brit. med. J.*, 1966).

Management of Accidents

I. Introduction

Family doctors and casualty officers deal with the majority of minor accidents to children. Serious injuries may be treated by consultant surgeons, while paediatricians are concerned with medical emergencies and acute poisoning. Should an accident cause complicated or multiple injuries many specialists may become involved: the orthopaedic surgeon will deal with the fracture; the plastic surgeon the burn or the dog-bite of the face; and the paediatric or general surgeon the ruptured internal viscera. Thus, though each injury and every complication is expertly dealt with, there may be divided responsibility, fragmentation of care, perhaps overlap of treatment, and failure of total assessment. Because many different specialists are concerned the importance of accidents in childhood, and the size and complexity of the subject, both nationally and locally, may not be sufficiently appreciated. The result will be failure to arouse the public and the professional conscience.

Two general principles should underlie care of the injured child. Firstly his injury should have the best treatment, and secondly his visit to hospital, whether as inpatient or outpatient, should cause him and his parents as little distress as possible. These principles determine the kind of provision that should be made for the hospital care of injured children.

II. Inpatient Arrangements

(a) General Aspects

All children should be admitted to children's units and not to adult wards or to the side-wards of adult units. This important principle is supported by the Accident Services Review Committee (Osmond-Clarke Committee) but is not yet generally accepted, for there are still many children in adult wards. We therefore state our reasons for endorsing it.

Technical.—The emergency resuscitation and treatment of infants and children call for special medical and nursing

* Abridged version. Copies of the full memorandum can be obtained from the Secretary, British Paediatric Association, 30 Guilford Street, London W.C.1.

† Throughout this memorandum the word "accident" includes accident, poisoning, and violence.

experience and skills. These include administration of intravenous fluids, collection of blood and other samples for analysis, and understanding of fluid and electrolyte balance in young children. The nursing of infants and young children presents no difficulty in children's wards geared to the daily practice of the specialized techniques used. The best results are obtained by people who are familiar with these methods and with the technical problems presented by emergencies in small children, and who have the right sort of equipment immediately available. These conditions obtain only in large children's hospitals and in large children's units in general hospitals.

Psychological.—Children, especially those under 6 years of age, are particularly liable to emotional upset as a result of admission to hospital, and everything possible should be done to minimize this and to promote quick recovery. Only with the special experience and skills mentioned above are the necessary technical procedures likely to be carried out with the minimum of disturbance to the child. The medical, nursing, and auxiliary staffs in a children's unit are expert in dealing with children and acutely aware of their needs, both physical and emotional. Ward routines and arrangements are suited to the needs of children, visiting by parents is encouraged, and mothers can be admitted with their children. Play facilities are available and children have the companionship of others of their own age. Schoolteachers play an important part in preventing the educational handicap which might otherwise develop during a long stay in hospital.

In order to provide the necessary experience and to attract enough doctors and nurses of the right calibre, a children's unit must be large. Spence (1947) thought that the minimum size for a children's unit should be 60 beds, while the Nuffield Foundation report on children in hospital stated that 40 beds should be the minimum, but that where the local population is large enough there should be at least 60 beds (Duncum, 1963).

(*b*) *Inpatient Services in District General Hospitals*

The majority of injured children needing admission to hospital will in the future be treated in children's units in district general hospitals. These units should consist of 60 beds or more and provide for a wide variety of medical and surgical cases. In areas with more than one district general hospital it may prove advisable to concentrate the inpatient facilities in one of them in order to achieve the size necessary for an efficient unit. Obviously it will be more satisfactory if the paediatric unit is in the same hospital as the main accident and emergency department.

In some units, medical, surgical, and orthopaedic cases are nursed together, whereas in others they are in separate wards. Whatever the arrangement, there should be the closest possible liaison between the consultant paediatrician and his surgical colleagues.

(*c*) *Inpatient Services in Regional Paediatric Centres*

There is a definite need for a large paediatric centre in each hospital region to which the more difficult and complex cases can be referred, either directly or by transfer from a district general hospital. The regional paediatric centre should be a children's hospital closely associated with the main regional teaching hospital. The centre should include specialties such as children's orthopaedic surgery, neurosurgery, otolaryngology, ophthalmology, plastic surgery, dermatology, etc., as well as paediatric medicine, surgery, and psychiatry. Such comprehensive provision cannot be effectively made in hospitals of fewer than 200 beds. The services available in the centre would enable a children's accident unit to be established, to serve the surrounding district and to act as the regional reference centre for the more complex problems of accidents to children.

It may be argued that such a children's accident unit should be associated with the adult accident centre rather than with the regional paediatric centre (whether the latter be a children's hospital or a large children's unit in a teaching hospital). A major advantage, however, of associating the regional children's accident unit with the regional paediatric centre is that specialists expert in the paediatric aspects of their subjects will be immediately available. The advantage of having, for example, consultant anaesthetists experienced in the management of small children can scarcely be overestimated, and the same applies to paediatric biochemists, radiologists, and other specialists.

A reason sometimes advanced against the establishment of regional centres for children is that parents will have to travel further when visiting them. This difficulty can be reduced by allowing unrestricted visiting and providing accommodation for mothers to stay in hospital. Furthermore, children in the regional centre are there because of the severity or nature of their injury, and their parents accept the inconvenience in the knowledge that their children are getting expert treatment not available nearer home.

Two special types of injury need further consideration: burns and scalds, and head injuries. Many of these can be dealt with locally, but others must go to the regional centre because of the specialized surgical and nursing techniques required. Severely burnt children need medical and surgical supervision throughout the whole 24 hours, with precise biochemical and haematological control. Renal dialysis may be needed. Infection may be a complication. The child-psychiatrist may help to prevent or deal with the withdrawal symptoms which frequently occur, and the services of the physiotherapist, dietitian, and medical social worker may all be required.

For these reasons special units for children with burns or head injuries should usually be provided in the regional paediatric centre. If such units are not practicable, the closer the children's centre is to the wards where the children with burns or head injuries are cared for the better will be the liaison between paediatricians and surgeons, which is the key to satisfactory care.

III. Accident and Emergency Services (Casualty Departments)

The arrangements for injured children in outpatient departments are generally less satisfactory than those for inpatients. Children's hospitals—that is, general hospitals catering solely for children—are often too small to have casualty departments well enough staffed to be efficient, while, on the other hand, few accident and emergency departments in general hospitals provide the necessary special facilities for children, nor do they usually have medical and nursing staff with paediatric experience.

The aim of outpatient care, as with that for inpatients, should be to provide the best medical attention with the minimum of emotional upset to the child. To achieve this:

(*a*) The medical, nursing, and auxiliary staff who deal with children should be trained and experienced in paediatric techniques. This should apply throughout the 24 hours and seven days a week.

(*b*) Paediatric advice and help should always be available at both consultant and registrar level.

(*c*) Unnecessary delays should be avoided. When the child arrives at the hospital, treatment, or admission if indicated, should be immediate and not after a long, tiring, and perhaps harmful delay. The reception area should be near to the children's unit, and thus minimize the time seriously injured patients have to travel.

(*d*) Children should be shielded from unpleasant sights and sounds, such as severely injured, noisy, or drunken people.

In the district general hospital the accident and emergency department should have a separate entrance and separate waiting space for children so that they will not come into contact with

seriously injured adults; there should also be children's examination and recovery rooms, appropriately furnished. The paediatrician should work very closely with the surgeon in charge of the department, and should be consulted about the planning and organization of the department.

The children's accident unit associated with the regional paediatric centre should provide a full accident and emergency service for children. In those regions where the centre is part of the main hospital campus it will sometimes be convenient to place the children's accident unit close to the adult accident unit so that operating-theatres and other services can be shared. If a choice has to be made, however, it is preferable to site the children's accident and emergency service close to the children's inpatient unit. In view of the high proportion of poisonings which occur in children, the regional poisons bureau might well be sited at the children's accident unit.

As in all units, whether medical or surgical, the quality of the work done in the children's accident unit will depend on the degree of supervision by senior staff. The consultant in administrative charge should be responsible for ensuring that the junior staff have adequate teaching, supervision, and support, and that an experienced doctor is always available to receive the seriously injured child. Jones *et al.* (1966) have published a report on the work of a children's casualty department, and their conclusions about the advantages to children of such a department strongly support our own.

Research

The cost to the nation of accidents in childhood must be enormous, yet surprisingly little co-ordinated research is being carried out.

Aspects requiring further investigation include the following: (*a*) accurate estimation of the size and nature of the problem, particularly in relation to non-fatal accidents; (*b*) the family and community relationships of accidents in childhood (Backett and Johnston, 1959); (*c*) the physical, psychological, and educational antecedents and sequelae; (*d*) the biochemical and pathological effects of trauma in childhood, together with the day-to-day management of injured children; and (*e*) "operational research"—that is, a critical evaluation of methods and techniques and their results, and of the organization and efficiency of accident services.

The regional accident unit should act as a centre for the dissemination of information about accidents. It should also maintain a close liaison with statutory bodies and voluntary societies, both national and local, that are interested in the whole problem, and particularly in accident prevention. The large subject of accident prevention is at present being considered by the Medical Commission for Accident Prevention, and is not discussed in this memorandum.

Conclusion

Too little thought has been given to the special needs of the injured child. In 1962 the Standing Medical Advisory Committee of the Central Health Services Council produced a report on the Accident and Emergency Services. This important blueprint for the future did not consider services for children, and indeed only once mentioned the special needs of children. The President of the British Paediatric Association wrote to the *British Medical Journal* (Harris, 1963), drawing attention to this omission and the disparity between the report and that on the Welfare of Children in Hospital (1959). In reply, Sir Harry Platt, who had been the chairman of both committees, stated: "The Report on Accident and Emergency Services presents no challenge to the now widely accepted recommendation of the Report on the Welfare of Children in Hospital." He went on to say, "It is important, therefore, that the paediatricians should support their colleagues (in particular, the orthopaedic surgeons) in seeing that separate accommodation (both inpatient and outpatient) for children is provided in all such plans" (Platt, 1963). We hope that Sir Harry Platt's advice will be acted on, and in this memorandum we have tried to show how it can best be done.

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RESEARCH IN PROGRESS

M.R.C. Rheumatism Research Unit

On 26 June the Medical Research Council's Rheumatism Research Unit held an open day for the press. The unit, whose honorary director is Professor E. G. L. BYWATERS, is housed at the Canadian Red Cross Memorial Hospital at Taplow in Berkshire, and was opened in 1947; it was taken over by the M.R.C. in 1958. Much of its work is concerned with studying and treating chronic rheumatism and other connective diseases in children and adults, while the research programme is largely orientated towards related immunological problems.

Juvenile Rheumatoid Arthritis

Dr. BARBARA M. ANSELL described some of the problems of treatment of juvenile arthritis, pointing out that this aimed to leave the patient with a minimum of residual damage once the activity of the disease had died down. Three main principles were involved: the overall management of the patient and the prevention of deformities; the intelligent use of drugs; and co-operation between the various medical and social organizations concerned.

In treatment serial correction of deformities by splints might be necessary, and various plastics for making the latter were being tried out. Hydrotherapy played a valuable part in treatment, as did physiotherapy, which had to be individually planned for each child. Dr. Ansell considered that salicylates were still the safest and the most effective drug available, while if corticosteroids had to be used the aim should be rapidly to try to get the dose down to a minimum level, possibly by adding salicylates as well. Failure to grow in height had been found to be a major