Planning for major incidents involving children by implementing a Delphi study

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Abstract

This paper provides a practical approach to the difficult problem of planning for a major incident involving children. It offers guidance on how general principles resulting from an expert Delphi study can be implemented regionally and locally. All phases of the response are covered including preparation, management of the incident, delivery of medical support during the incident, and recovery and support. A check list for regional planners is provided. Supplementary equipment is discussed and action cards for key roles in the paediatric hospital response are shown. Particular emphasis is placed on management of the secondary-tertiary interface including the special roles of paediatric assessment teams and paediatric transfer teams. A paediatric primary triage algorithm is provided. The important role of local interpretation of guidance is emphasised.

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Table 1 Planning checklist for hospitals that might receive children from a major incident

Statement of paediatric resources and estimated capacity
Robust paediatric incident notification procedures
Paediatric incident activation procedures
Paediatric equipment provision
Paediatric incident coordination
Paediatric action cards
Paediatric coordinator
Paediatric assessment team(s)
Paediatric treatment team(s)
Paediatric transport team(s)

Table 2 Minimum supplementary paediatric equipment for 10 children

	Item	Number
Airway and cervical spine	Airways 00-2	5 each
	Endotracheal tubes 2.5-6.5 mm	5 each
	Yankauer sucker (paediatric)	10
	Soft sucker 8-10 g	10 each
Breathing	Semirigid cervical collars (paediatric)	5 sets
	Child self inflating bag	2
	Face masks 00-2	1 each
	Oxygen masks (with reservoir) (paediatric)	10
Circulation	Chest drains 24-28 F	2 each
	Venous cannulae 18-24 g	20 each
	Intraosseous cannulae	2
	50 ml syringes with luer lock	2
	Giving sets (paediatric)	20
	ECG electrodes (paediatric)	25
	Defibrillation pads (paediatric)	2 pairs
Other	Urinary catheters 8-10 g	2 each
	Nasogastric tubes 8-10 g	2 each
	Weight-height or weight-age nomogram with drug doses (Broselow tape or Oakley chart)	1
	Spinal board (paediatric)	1

Four to five major incidents occur in the United Kingdom each year¹ and many involve children. However, a recent survey showed that only 31% of hospitals make specific plans for the care of children involved in major incidents.² The number of children involved in recent incidents has ranged from 6-67 (10-100% of all victims).

We have reported the results of an expert Delphi study examining the care of children in major incidents.³ This paper offers practical advice on how general guidance that resulted from the Delphi study can be implemented at regional and local hospital and prehospital level. We have not dealt with the care of children who are indirect victims of an incident (for example when main carers are injured or killed) as this is not primarily a health service responsibility.

Our guidance is intended to undergo local interpretation and to be incorporated as part of an overall major incident plan. In particular it seeks to use the expertise of tertiary and secondary paediatric services to support all phases of the major incident response when children are involved.

Practical advice is given for the preparation phase, for the management of the incident, the delivery of medical support during the incident itself, and for the recovery and support phases following the incident.

Preparation

We have considered three aspects of preparation: planning, equipment, and training.

PLANNING

Regional planners should ensure that plans are in place for children at every receiving hospital, and that a realistic assessment and statement of the paediatric resources available has been made at each hospital. Units should also make realistic estimates of the number of seriously ill or injured children they are capable of receiving in one hour. Table 1 provides a checklist for hospitals that might receive children from a major incident.

EQUIPMENT

Planning should assume that at least 10-15% of major incident patients require paediatric equipment. Prehospital paediatric equipment should be available as a supplement to general equipment, either in the form of snatch bags or boxes. Paediatric equipment must be made available in each area receiving patients. Table 2 shows the minimum supplementary equipment for every 10 children expected.

Table 3 Paediatric coordinator action card

Responsibilities

Overall control of the paediatric response
 Staffing of senior key appointments
 Liaison with tertiary hospitals regarding the need for specialist paediatric teams, personnel, or equipment
 Ensuring that a safe level of provision is maintained for current inpatients
 Control of the phasing of the stand down of the hospital paediatric response
 Coordination of post-traumatic counselling of children and staff

Immediate action

Assume control of the paediatric aspects of the hospital response
 Ensure that the following post is filled:
 senior nurse-children
 if not filled then appoint a suitably senior member in the interim
 Liaise with the medical coordinator, the senior nurse-children, and the senior manager regarding the state of preparedness of the hospital to receive children, and the initial availability of appropriate staff
 Liaise with coordinators of the major incident responses in other receiving hospitals, to ascertain the initial requirements for paediatric teams, specialist personnel, and equipment
 Instruct consultant paediatric staff who are not already included in the plan as they arrive
 Continually liaise with the following senior key personnel:
 medical coordinator
 senior nurse-children
 senior manager
 to receive reports on the situation as it develops, and to review the effect of the major incident response on the normal activities of the hospital
 Decide at an early stage any limitations on normal hospital activities
 Liaise with the senior manager regarding an initial press release
 As the incident develops ensure that adequate arrangements are made for shift working to allow adequate rest for staff
 As the surgical response develops liaise with the duty consultant surgeon and the duty consultant anaesthetist to ascertain the current availability of surgical resources
 Liaise with senior key personnel regarding how to stand down the hospital response
 Liaise with the appropriate services regarding provision of post-traumatic counselling of major incident casualties admitted to the hospital, and of staff involved in the major incident response

Priorities

Overall coordination of the paediatric response
 Liaison with other receiving hospital coordinators regarding paediatric requirements
 Monitoring and limitation of normal hospital paediatric activities
 Liaison with the specialist anaesthetists and surgeons regarding the paediatric surgical response
 Coordination of the phasing of the stand down
 Coordination of post-traumatic counselling for children and staff

TRAINING

All clinicians involved in the paediatric clinical response should be trained at least to the level of advanced paediatric life support (APLS) provider.⁴ In addition, those involved in managing the response and all who might be involved in the prehospital response should be trained in major incident management to the level of major incident medical management and support (MIMMS) provider⁵ or equivalent.

Medical management

Medical management includes command and control of the response, safety aspects, communications, and assessment. Only the command of the response will differ when children are involved.

COMMAND

Children will be dispatched to hospital by the ambulance and medical incident officers at the

scene, and transported to hospital by the ambulance service. All hospitals that might receive children should appoint a paediatric coordinator to assist the hospital coordination team in managing them and overseeing their care. Table 3 shows an action card for the paediatric coordinator.

Some specialist paediatric resources and services are limited so decisions must be made about which patients need them most. These scarce resources are most likely to be found at children's hospitals, which must therefore be central to the decisions about how patients are allocated. Where there is no specialist children's hospital, those housing the specialist services must nominate a lead hospital. Deciding on resource allocation will be much more difficult if children are dispersed around many receiving hospitals. To inform the decision making process, lead paediatric units must be

Table 4 Paediatric assessment team action card

Responsibilities

Estimate total number of children in receiving hospitals who may need paediatric tertiary services
 Liaison with paediatric specialist services to ascertain the level of provision available
 Identify individual children suitable for transfer to tertiary services
 Liaise with paediatric coordinators in receiving hospitals to arrange transfer

Immediate action

Proceed to lead paediatric hospital and report to the paediatric coordinator
 Liaise with the paediatric coordinator to ascertain the number of children likely to be involved, the number of receiving hospitals, and the paediatric specialist services that may be required
 Liaise with the relevant specialist paediatric services to ascertain preparedness and level of provision available
 Proceed to the receiving units and liaise with the local paediatric coordinator to ascertain the number of children (if any) who need specialist provision
 Estimate the relative need of each child for specialist provision
 Match availability with need in each receiving unit
 Arrange transfer of children who can be dealt with in the specialist units
 Ensure that specialist units and receiving hospital staff have liaised regarding children who have not been transferred

Priorities

Estimation of the availability of specialist services
 Estimation of the need for each specialist service within each receiving unit
 Matching need with availability

Figure 1 Paediatric primary triage algorithm.

able to provide paediatric assessment teams (PATs) that can go to the receiving hospital to assess which children warrant transfer to specialist services. It is likely that PATs will be based on existing paediatric retrieval services. Table 4 shows an action card for a PAT.

Medical support

Medical support for children involved in major incidents includes triage, treatment, and subsequent transport.

TRIAGE

If only a few children are involved then standard triage sieve–triage sort methodology³ can be used, despite the fact that it is known to over triage children. If there are more than five children aged 3 years or younger then the Eichelberger modification⁶ should be applied to both sieve and sort methods. Figure 1 shows a modified primary triage scheme (sieve).

Table 5 Paediatric treatment team

Each team will consist of at least

1 Doctor: Paediatric/paediatric anaesthetic experience

1 Nurse: Registered sick children's nurse

On no account remove the identifying bracelet with the major incident casualty number from any child

Responsibilities

Assessment and treatment of seriously ill or injured children as directed by the senior doctor in the receiving hospital to which assigned

Provision of specialist paediatric advice and practical help to casualty treatment teams in the receiving hospital to which assigned

Casualty clinical documentation

Immediate action

On formation collect identifying badges and this action sheet

Proceed to the staff reporting area of the hospital indicated and report to the senior person in that area, and then to the appropriate clinical area

Assess and treat children indicated to you in order of priority

Report any changes in condition to the senior doctor

Record all examination and treatments on the clinical record card

Double check the identity of all children before treatment as many may only be identified by a major incident casualty number

Place all clothes and other items in a property bag marked with the correct major incident casualty number

Do not dispose of any of the child's clothing or personal effects as these may be invaluable for identification

Do not move any children without informing the senior doctor and nurse

If children are moved, ensure a record of their destination is kept and given to the senior nurse

Priorities

Assessment and treatment of seriously ill or injured children

Provision of advice and practical help to others involved in the care of seriously ill or injured children

Clinical documentation

TREATMENT

It is most unlikely that individual receiving hospitals will be able to provide enough specialist paediatric staff to oversee the treatment of every child admitted during a major incident. Nor indeed will this be necessary as many emergency department staff will be well versed in caring for injured children. However, paediatric expertise should be available for seriously ill and injured children wherever they are. This can be achieved by forming paediatric treatment teams; an action card for such a team is provided in table 5.

TRANSPORT

If many children are involved, it is likely that only those identified by the PAT as requiring tertiary paediatric care will be transported from the primary receiving hospital. If few are involved then the decision to move may be made following normal referral mechanisms. However this decision is made, sick or injured children must be stabilised and transported by clinicians skilled in their transfer. Such personnel may be available from within the receiving hospital or may be made available by the tertiary paediatric centre. To facilitate these transfers, a paediatric transfer team should be formed; an action card for a paediatric transfer team is provided in table 6.

Recovery and support

Emotional support and counselling should be offered to children, families, and staff. Adequate provision must be made for this and maintained until no longer needed.

Audits should be done following a major incident to determine whether the care of children was optimal. Children's hospitals should coordinate collation of a casualty incident profile (CIP)¹⁻⁷ of the child victims of the incident. As a minimum, the CIP should include the following:

- age
- sex
- mechanism of injury (if any)
- injury description (AIS)/illness description (ICD)
- disposal.

Table 6 Paediatric transfer team action card

Each team will consist of at least:
1 Doctor: Paediatric transfer/anaesthetic experience
1 Nurse: RSCN transfer/ICU/A&E experienced
<i>On no account remove the identifying bracelet with the major incident casualty number from any child</i>
Responsibilities
Safe transfer of critically ill children between clinical areas
Transfer of children between hospitals
Immediate action
On formation collect identifying badges and this action sheet
Proceed to the reporting area of the hospital indicated and report to the senior person in that area, and then to the appropriate clinical area
Liaise with the team leader of the casualty treatment team or paediatric treatment team treating the child allocated to you, and receive a full report
Take over care of the child
Continue care or arrange transfer of the child as indicated
If care is subsequently handed to others give a full report to the team taking the child from you
Place all clothes and other items in a property bag marked with the correct major incident casualty number
Do not dispose of any clothing or personal effects from children as these may be invaluable for identification
Do not move any children without informing the senior doctor and nurse in the area
Make a record on the clinical notes of the time and destination of the transfer
Ensure a record of their destination is given to the senior nurse in the area
Priorities
Transfer of critically ill children between clinical areas
Transfer of children between hospitals

Once this has been done, a postincident meeting involving all hospitals concerned should discuss how the children were cared for.

Conclusion

We have provided a practical approach to the difficult problem of planning for the rare but potentially devastating occurrence of a major

incident involving children. The principles we expound can be applied generally. Local decisions must be made on how to modify our approach to work in practice. Children's emergency and inpatient provision changes, so local decisions to designate lead and receiving hospitals are essential. For this reason strategic (regional) planning teams must include a specialist with expertise in paediatric matters.

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