Planning for major incidents involving children by implementing a Delphi study

Kevin Mackway-Jones, Simon D Carley, Joan Robson

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.

Keywords: major incident; Delphi study; planning; triage

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) |

Four to five major incidents occur in the United Kingdom each year 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. 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. 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.
Planning for major incidents by implementing a Delphi study

Table 4 Paediatric assessment team action card

<table>
<thead>
<tr>
<th>Responsibilities</th>
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</thead>
<tbody>
<tr>
<td>Overall control of the paediatric response</td>
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<td>Coordination of post-traumatic counselling of children and staff</td>
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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
- medical coordinator
- the senior manager regarding the state of preparedness of the hospital to receive children, and the initial availability of appropriate staff

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

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
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. 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) provider 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

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

Figure 1 Paediatric primary triage algorithm.

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) 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 5 Paediatric treatment team

<table>
<thead>
<tr>
<th>Each team will consist of at least</th>
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<tbody>
<tr>
<td>1 Doctor: Paediatric/paediatric anaesthetic experience</td>
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<tr>
<td>1 Nurse: Registered sick children’s nurse</td>
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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
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.

Simon Carley was Hillsborough Research Fellow of the Royal College of Surgeons of England while this research was carried out, and was supported by a grant from the Hillsborough Trust.

### Table 6 Paediatric transfer team action card

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<td>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</td>
</tr>
<tr>
<td>Liaise with the team leader of the casualty treatment team or paediatric treatment team</td>
</tr>
<tr>
<td>treating the child allocated to you, and receive a full report</td>
</tr>
<tr>
<td>Take over care of the child</td>
</tr>
<tr>
<td>Continue care or arrange transfer of the child as indicated</td>
</tr>
<tr>
<td>If care is subsequently handed to others give a full report to the team taking the child from you</td>
</tr>
<tr>
<td>Place all clothes and other items in a property bag marked with the correct major incident casualty number</td>
</tr>
<tr>
<td>Do not dispose of any clothing or personal effects from children as these may be invaluable for identification</td>
</tr>
<tr>
<td>Do not move any children without informing the senior doctor and nurse in the area</td>
</tr>
<tr>
<td>Make a record on the clinical notes of the time and destination of the transfer</td>
</tr>
<tr>
<td>Ensure a record of their destination is given to the senior nurse in the area</td>
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