Injury surveillance in a children’s hospital—overcoming obstacles to data collection

N V Doraiswamy

Abstract
Objective—To understand the problems involved in collection of injury surveillance (Glasgow Children Hospital Injury Reporting and Prevention Programme, CHIRPP) forms.

Methods—Glasgow CHIRPP forms were issued by the clerical staff to all eligible child carers for details of the injury or ingestions by the child, and the retrieval rate of forms was monitored. Reasons for the poor collection of forms were identified and rectified.

Results—The collection rate of Glasgow CHIRPP forms was poor when the system was introduced in 1993. It improved when the forms were issued by nursing staff, and considerable improvement was noted when the triage nurse was made responsible.

Conclusions—When a named individual was made responsible there was an improvement in the retrieval of Glasgow CHIRPP forms. A few other simpler problems relating to the retrieval of forms were identified and rectified.


Keywords: injury surveillance; children; CHIRPP form; data collection

Accident prevention is a governmental priority in the UK. In a recent literature review, the importance of high quality local data for targeting interventions to reduce childhood accidents and then evaluating outcomes were emphasised. Accident and emergency (A&E) departments are the “missing link” in the range of sources currently generating data on injuries in the NHS. In planning preventive measures it is vital to collect and analyse local data on frequency and circumstances of injuries, and injury surveillance in A&E departments is an important means of achieving this. The purpose of the present study was to understand and overcome the problems underlying the initial poor collection rate of the injury surveillance forms in order to maximise the potential of the system for injury prevention.

Methods
With the help of a senior member of the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP), childhood injury surveillance was initiated in 1993—the Glasgow Children Hospital Injury Reporting and Prevention Programme (Glasgow CHIRPP). A large explanatory notice (size A2) about CHIRPP and the importance of injury surveillance was displayed in the patient’s waiting room so that carers and children would be able to read about it. The same explanation (size A3) was displayed in all the examination, treatment, and plaster rooms. After completion of triage, a verbal explanation of Glasgow CHIRPP was offered and an A4 size information sheet, with the same explanation, was distributed along with the injury surveillance form (fig 1), kept in a pad with a pen, to the accompanying carers of children (up to the age of 14 years) presenting with injury or ingestion.

The carers were not required to complete the form if they chose not to. They recorded the details about the child (name, sex, date of birth, address, postcode), about themselves (telephone number, relationship to the child, and time of visit), injuries in a free text form (time, location, circumstances, mechanism), or sitting position (if the patient was a passenger in a vehicle), and whether any consumer product or safety equipment was involved. On average, it took fewer than three minutes to record the details by the carer. When necessary, a nurse or member of the medical staff assisted the carers when completing the form. After examining the patient medical staff collected the form and completed the details about the nature of injury, anatomical part involved, and disposal on the reverse side of the form (fig 2). On average this could be done in fewer than 20 seconds. The forms were collected each morning and computerised. Glasgow CHIRPP software has been written in a fourth generation computer language (SCULPTOR). At present this is a stand alone system, and with technical improvements it may be possible to incorporate it into routine A&E department computer systems in the future.

The collection rate of Glasgow CHIRPP forms was monitored and discussed at intervals with the clerical, nursing, and medical staff and the carers to identify the problems and solutions.

Results
In the initial stages, the Glasgow CHIRPP forms were handed over to the carer at the time of registration by the clerical staff, but there was an unacceptably low level of capture of forms (fig 3). Despite tackling the problems indicated by the carers (table 1), retrieval of the forms was only minimally improved. The difficulties perceived by the clerical staff about issuing forms were established after discussion (table 2). Therefore, after consultations, the nursing staff took over the responsibility for this function in 1996 and the collection rate of forms gradually improved (fig 4) and several problems were identified (table 3). The anticipated improvement was still not occurring and
after discussion with nursing and medical staff it was concluded that no one individual felt responsible. It was therefore decided that the triage nurse, who could be identified from the duty rota for any particular period, should be made responsible for issuing the forms. It was also felt that the triage nurse was a better person to recognise injuries from illnesses as more details would be given to her by the carer than to the clerical staff. Such a change has produced considerable improvement in the collection rate of Glasgow CHIRPP forms from February 1997 onwards (figs 3 and 4).

**Discussion**

Few surveillance systems have been implemented in the UK, apart from the home and leisure accident surveillance systems (HAAS and LASS) of the Department of Trade and Industry. These systems are limited in scope and operate in only a few areas of the country with only one participating hospital in Scotland. Glasgow CHIRPP was therefore introduced to try to meet the local needs for injury surveillance data. Glasgow CHIRPP forms were used to collect and analyse data on circumstances, mechanisms,
Injury surveillance in a children’s hospital and types of injuries in children up to the age of 14 years who presented to the A&E department for injuries or ingestions. The data indicated the potential of the system for identifying both hazardous environments and vulnerable population subgroups at whom specific preventive measures could be targeted.

The main methodological problem encountered with Glasgow CHIRPP was the low capture rate of forms; this was due mainly to poor staff compliance. Persuasion, encouragement, and repeated individual and group discussions with the clerical, nursing, and medical staff stimulated interest and motivation, with limited results. More forms were issued and collected when responsibility was transferred from clerical to nursing staff, especially when the triage nurse was made accountable for the system from February 1997 (figs 3 and 4). The services of a triage nurse has been utilised previously to collect injury surveillance forms. Clerical staff felt that they could not identify whether the problem was due to injury or illness from parents who were possibly offering a limited description. Therefore the forms were

| Doctor’s name: (capitals) | Note: NEC means "not elsewhere classified"
|--------------------------|-----------------------------------|

Complete only for first attendance of a particular episode

1. Nature of the injury

<table>
<thead>
<tr>
<th>Sevrest</th>
<th>Second</th>
<th>Third</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SELECT UP TO THREE CODES</td>
<td></td>
</tr>
</tbody>
</table>

Systemic and special injury
90 multiple system trauma
91 poisoning (through skin/ lungs/mouth/etc)
93 asphyxiation or respiratory difficulty
94 electric shock
95 over-exertion, heat/cold stress
96 concussion
97 dental injury
98 no injury detected

Soft tissue
01 cut/laceration
02 puncture
03 bite
04 superficial abrasion
05 penetrating wound
06 other wound, including amputation
07 haematoma/bruising
08 haemorrhage
09 inflammation/ oedema/tenderness
10 burn, full thickness
11 burn, partial thickness
12 foreign body in soft tissues
13 damage to major blood vessel
14 crushing injury
15 obstruction
16 frostbite

Bone, tendon, or joint
20 fracture
21 dislocation
22 sprain/strain
23 subluxation

2. Body part

<table>
<thead>
<tr>
<th>Sevrest</th>
<th>Second</th>
<th>Third</th>
</tr>
</thead>
<tbody>
<tr>
<td>In these boxes write the body part code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>recorded in section 1 left</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Systemic and special injury
000 defined as in section 1 at left

Head
101 eye
102 scular adnexum
103 nose
104 mouth external, e.g. jaw, lip
105 ear
106 face/cheek/forehead/scalp
107 skull base
108 skull vault
109 neck, NEC
188 other injury to head

Upper extremity
201 clavicle
202 scapula
203 shoulder, NEC
204 humerus
205 upper arm, NEC
206 radius, ulna
207 elbow
208 forearm
209 wrist
210 carpal bone
211 metacarpal bone
212 digit/ phalanx
213 hand, NEC
298 other injury to upper extremity

Lower extremity
301 hip
302 femur
303 thigh
304 knee/patella
305 tibia/fibula
306 leg
307 ankle
308 tarsal bone
309 metatarsal bone
310 digit/ phalanx
311 foot, NEC
298 other injury to lower extremity

Trunk
401 rib(s)
402 saccroiliac joint
403 spine (including cervical), excluding cord
404 pelvis
405 chest, NEC
406 abdominal wall
407 upper back, NEC
408 lower back, NEC
409 pelvis
410 heart
411 kidney(s)
412 bladder
498 other injury to trunk

Respiratory tract
501 pharynx
502 larynx
503 trachea
504 bronchus
505 lung
598 other injury to respiratory tract

Digestive system
601 mouth internal, e.g. gum, palate
602 oesophagus
603 stomach/ duodenum
604 small bowel
605 colon
606 rectum
607 liver
608 spleen
609 pancreas
698 other injury to digestive tract

Nervous system
701 brain, not concussion
702 brain stem
703 cervical spinal cord
704 thoracic spinal cord
705 lumbar spinal cord
706 peripheral nerve
798 other injury to nervous system

Intent of injury
0 accidental injury (that is, unintentional)
1 intentionally self inflicted, or possibly so
2 victim of assault or possibly so
6 unknown intent
4 NAI/CSA

What you did with your patient
01 advice only
02 treated, sent home
03 treated, referred to outpatient
04 treated, referred to family doctor
05 treated, other referral
06 short stay observation in day surgery unit/A&E
07 admitted to hospital
08 transferred to other hospital
09 DOA or died in A&E

Figure 2 Glasgow CHIRPP form for medical staff; CSA = child sexual abuse; DOA = dead on arrival; GC = general clinic; NAI = non-accidental injury.
Anxiety
"Cannot recall all details"
Details not known by accompanying person
Language problems
Reading glasses not available
Illiteracy
Influence of alcohol
Not willing (feeling of guilt, although this was rare)

Pressure of usual work
Considered as additional workload
Decrease in manpower—only skeleton staff during weekends, public holidays, out of office hours (relatively high attendances)
Not realising importance

Figure 3  Number of Glasgow CHIRPP forms collected during 1993–98.

Table 1 Reasons identified for poor collection rate of Glasgow CHIRPP forms: carers

- Anxiety about child/injuries
- "Cannot recall all details"
- Details not known by accompanying person
- Language problems
- Reading glasses not available
- Illiteracy
- Influence of alcohol
- Not willing (feeling of guilt, although this was rare)

Table 2 Reasons identified for poor collection rate of Glasgow CHIRPP forms: clerical staff

- Pressure of usual work
- Considered as additional workload
- Decrease in manpower—only skeleton staff during weekends, public holidays, out of office hours (relatively high attendances)
- Not realising importance

not necessarily being distributed to the carers of all injured children or those who had ingested medications.

The supplies department was alerted to the need to provide pens, pads, and the forms in sufficient numbers in advance. The medical and nursing staff were constantly encouraged. The number of forms completed in full also increased as the same medical staff had to fill in the form when the incomplete forms were returned. The carers were helped when problems were recognisable (Table 1).

As this is a tertiary, referral hospital, Glasgow CHIRPP forms were not filled in when a child was transferred directly to the intensive care unit or ward from another hospital, bypassing the A&E department. This is being addressed and will enhance the collection rate of forms when the problem is solved.

Injury surveillance has great potential and, once the obstacles to collecting data have been overcome, the complete data will help pave the way for planning local accident prevention in the future.

Conclusion
The collection rate of injury surveillance forms can be enhanced by identifying and rectifying local problems. A named person, like the triage nurse, who is available at all times in the A&E department, will help to identify suitable carers and therefore considerably improve the collection of injury surveillance forms. The importance of cooperation and teamwork at all stages should be reinforced as and when necessary.

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Table 3 Reasons identified for poor collection rate of Glasgow CHIRPP forms: nursing and medical staff

- Additional workload
- Too many patients waiting
- Too long waiting time
- Lack of encouragement (resistance to the idea)
- Not aware of importance
- Considered a short term research project
- No individual accountability
- Not handing over during change of shift
- "Forgot to give/collect/fill in/lodge in collection tray"

Figure 4  Number of children who attended for injuries/ingestions and Glasgow CHIRPP forms collected in 1996–98.
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