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

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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.

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

Accident prevention is a governmental priority in the UK.^{1,2} 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.³ Accident and emergency (A&E) departments are the “missing link” in the range of sources currently generating data on injuries in the NHS.⁴ 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)⁵ childhood injury surveillance was initiated in 1993—the Glasgow Children Hospital Injury Reporting and Prevention Programme (Glasgow CHIRPP).⁶

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

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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.⁷ 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.⁶ Glasgow CHIRPP forms were used to collect and analyse data on circumstances, mechanisms,

Serial Parent or guardian

Royal Hospital for Sick Children, Yorkhill For all injuries and ingestions etc

Please give as much detail as possible

Child's surname Child's first name Boy ☐ Girl ☐

Home address

Postcode Date of birth / / Day Month Year

Home Tel No Work Tel No

1. When did the incident occur? Date: / / Time : am ☐ pm ☐

2. Where did the incident occur? (Give exact place and district)
(e.g. at junction of Byres Rd and Gt George St, at side of road in Hillhead; in bathroom at home in Partick)

3. What was the child doing at the time the incident occurred?
(e.g. washing up; having tea and playing around with sister; playing soccer; crossing road on way to school)

4. What went wrong?
(e.g. chased by dog and lost control of bike; fell out of tree; toy truck broke; hot coffee knocked over)

5. What actually caused the injury?
(e.g. swallowed perfume; grandma's sleeping tablets; jammed finger on hinge side of door)

6. If a specific product or article was involved, please give details;

Product Brand or make

Type or model

7. What safety precautions or devices were being used at the time the injury occurred?
(e.g. seat belt; infant car seat; child resistant bottle cap; bicycle helmet; none)

8. If a motor vehicle was involved, please give details;

Make and model Year Type of vehicle

(e.g. Honda Civic) (e.g. estate, saloon)

9. If the child was in a motor vehicle, show the child's seating position
Enter the number showing the child's position using the diagram ☐

Sometimes we need to get in touch with parents for additional information about an injury. If you do not wish to be contacted please place an X here ☐

Please note: 1 = driver

9 (other position which is not shown)

IMPORTANT: PLEASE HAND THIS SHEET BACK TO THE DOCTOR WHEN YOU ARE SEEN

Figure 1 Glasgow CHIRPP form for carer.

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.⁸ 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

<p>Doctor's injury summary</p>	<p>Doctor's name: (capitals)</p>	<p>Note: NEC means "not elsewhere classified"</p>
<p>Complete only for first attendance of a particular episode</p>		
<p>1. Nature of the injury</p> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>Severest</div> </div> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>Second</div> </div> <div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>Third</div> </div> <p style="text-align: center;">SELECT UP TO THREE CODES</p> <p>Systemic and special injury</p> <p>90 multiple system trauma</p> <p>91 poisoning (through skin/lungs/mouth/etc)</p> <p>93 asphyxiation or respiratory difficulty</p> <p>94 electric shock</p> <p>95 over-exertion, heat/cold stress</p> <p>96 concussion</p> <p>97 dental injury</p> <p>99 no injury detected</p> <p>Soft tissue</p> <p>01 cut/laceration</p> <p>02 puncture</p> <p>03 bite</p> <p>04 superficial abrasion</p> <p>05 penetrating wound</p> <p>06 other wound, including amputation</p> <p>07 haematoma/bruising</p> <p>07 haemorrhage</p> <p>09 inflammation/oedema/tenderness</p> <p>10 burn, full thickness</p> <p>11 burn, partial thickness</p> <p>12 foreign body in soft tissues</p> <p>13 damage to major blood vessel</p> <p>14 crushing injury</p> <p>15 obstruction</p> <p>16 frostbite</p> <p>Bone, tendon, or joint</p> <p>20 fracture</p> <p>21 dislocation</p> <p>22 sprain/strain</p> <p>23 subluxation</p>	<p>2. Body part</p> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>Severest</div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>In these boxes write the body part code</div> </div> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>Second</div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>for each of the corresponding injuries</div> </div> <div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>Third</div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>recorded in section 1 left</div> </div> <p>Systemic and special injury</p> <p>000 defined as in section 1 at left</p> <div style="display: flex;"> <div style="width: 45%;"> <p>Head</p> <p>101 eye</p> <p>102 ocular adnexum</p> <p>103 nose</p> <p>104 mouth external, e.g. jaw, lip</p> <p>105 ear</p> <p>106 face/cheek/forehead/scalp</p> <p>107 skull base</p> <p>108 skull vault</p> <p>109 neck, NEC</p> <p>198 other injury to head</p> <p>Upper extremity</p> <p>201 clavicle</p> <p>202 scapula</p> <p>203 shoulder, NEC</p> <p>204 humerus</p> <p>205 upper arm, NEC</p> <p>206 radius, ulna</p> <p>207 elbow</p> <p>208 forearm</p> <p>209 wrist</p> <p>210 carpal bone</p> <p>211 metacarpal bone</p> <p>212 digit/phalanx</p> <p>213 hand, NEC</p> <p>298 other injury to upper extremity</p> <p>Lower extremity</p> <p>301 hip</p> <p>302 femur</p> <p>303 thigh</p> <p>304 knee/patella</p> <p>305 tibia/fibula</p> <p>306 leg</p> <p>307 ankle</p> <p>308 tarsal bone</p> <p>309 metatarsal bone</p> <p>310 digit/phalanx</p> <p>311 foot, NEC</p> <p>398 other injury to lower extremity</p> </div> <div style="width: 45%;"> <p>Trunk</p> <p>401 rib(s)</p> <p>402 sacroiliac joint</p> <p>403 spine (including cervical), excluding cord</p> <p>404 pelvis</p> <p>405 chest, NEC</p> <p>406 abdominal wall</p> <p>407 upper back, NEC</p> <p>408 lower back, NEC</p> <p>409 genitalia</p> <p>410 heart</p> <p>411 kidney(s)</p> <p>412 bladder</p> <p>498 other injury to trunk</p> <p>Respiratory tract</p> <p>501 pharynx</p> <p>502 larynx</p> <p>503 trachea</p> <p>504 bronchus</p> <p>505 lung</p> <p>598 other injury to respiratory tract</p> <p>Digestive system</p> <p>601 mouth internal, e.g. gum, palate</p> <p>602 oesophagus</p> <p>603 stomach/duodenum</p> <p>604 small bowel</p> <p>605 colon</p> <p>606 rectum</p> <p>607 liver</p> <p>608 spleen</p> <p>609 pancreas</p> <p>698 other injury to digestive tract</p> <p>Nervous system</p> <p>701 brain, not concussion</p> <p>702 brain stem</p> <p>703 cervical spinal cord</p> <p>704 thoracic spinal cord</p> <p>705 lumbar spinal cord</p> <p>706 peripheral nerve</p> <p>798 other injury to nervous system</p> </div> </div>	
<p>3. Intent of injury</p> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>SELECT ONE CODE</div> </div> <p>0 accidental injury (that is, unintentional)</p> <p>1 intentionally self inflicted, or possibly so</p> <p>2 victim of assault or possibly so</p> <p>6 unknown intent</p> <p>4 NAI/CSA</p>	<p>4. What you did with your patient</p> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> <div>SELECT ONE CODE</div> </div> <div style="display: flex;"> <div style="width: 45%;"> <p>01 advice only</p> <p>02 treated, sent home</p> <p>10 treated, review later in A&E/GC</p> <p>03 treated, referred to outpatients</p> <p>04 treated, referred to family doctor</p> <p>05 treated, other referral</p> </div> <div style="width: 45%;"> <p>06 short stay observation in day surgery unit/A&E</p> <p>07 admitted to hospital</p> <p>08 transferred to other hospital</p> <p>09 DOA or died in A&E</p> </div> </div>	

Figure 2 Glasgow CHIRPP form for medical staff; CSA = child sexual abuse; DOA = dead on arrival; GC = general clinic; NAI = non-accidental injury.

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

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"

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 potential⁹ 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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Figure 4 Number of children who attended for injuries or ingestions and Glasgow CHIRPP forms collected in 1996-98.

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