

Hazard
(Edition No. 2)
December 1988

Victorian Injury
Surveillance System

Royal Children's Hospital
Parkville, Victoria
Australia 3052



VISS is Born!

The Victorian Injury Surveillance System is now born! In the first issue of Hazard we indicated that we were aiming to increase the coverage of our surveillance to a region of Melbourne that would permit us to capture most of the injury cases in children that warranted attention in a hospital Accident and Emergency Department. The Preston and Northcote Community Hospital (PANCH) and the Western General campus of the Maribyrnong Medical Centre (WGH) are now participating in the surveillance. This expansion has been made possible through the support of the Victorian Health Promotion Foundation.

This means that for the area broadly covered by Health Region 6 (see map), we can be reasonably sure that the vast majority of children's injuries will be treated at one of these hospitals - at least those that are serious enough to require hospital treatment. Injuries treated by general practitioners or private specialists may not be captured, but we believe that these represent a very small proportion of the overall total.

We have been busy organising this expansion and training new data processing staff. We have over 5,000 injuries in the database accumulated from Royal Children's Hospital patients, and we focus in this issue of Hazard on some topical and important issues.

VISS is a community resource and as such our success is measured partly by the extent to which people concerned about injury control use the data we have collected (see Using The Database).

Please think seriously about how our data could help you in your efforts to prevent injury, and give us a call if you think we can be of assistance.

Skateboard Injuries

Of the 5,065 cases recorded in the database there were 96 child injuries associated with skateboards (or 2% of the total).

Factors associated with sports & leisure injuries	Injured children
1. Bicycles or accessories	346
2. Playground equipment	306
3. Football	166
4. Skateboards	96
5. Soccer	65
6. Trampolines	52

Compared to other sports/leisure activities, skateboards rank 4th.

Sex	Sex ratio 6.4:1
Males 83 (86%)	
Females 13 (13%)	

Care must be taken when drawing conclusions from these statistics. These data do not yet reflect the injury experience of the defined catchment area of north-west Melbourne, and so we are uncertain as to the number of children "at risk" for injury. This important point relates to the choice of the most appropriate denominator for risk or rate calculation, and is discussed under Interpreting the Data. That is, we do not know how many children use skateboards, nor what the age and sex distribution of the users is.

For injuries of all types and causes, the sex ratio is 6:4 (male:female). Because we do not know the sex ratio amongst children who use skateboards in the community, we cannot be sure of the significance of this 6.4:1 male:female ratio of skateboard injuries. We do know that many more boys than girls use skateboards, but it could be that girls are in fact over-represented amongst injured children, or that boys are more at risk for injury. Alternatively, it may simply reflect the predominance of boys participating in the activity.

Age	
Age Range	Number of children
0-4	4
5-9	24
10-14	59
15-19	9

Over half of skateboard injuries occur in the 10-14 year age group, but again we do not know whether over half the riders are in this age range and cannot therefore point to this age as being a risk period. In fact it is likely that younger children with less well developed coordination and motor skills who are less experienced riders are more at risk of injury.

Time of Day and Day of Week

Overall most accidents occur between 4-7 p.m. Skateboard injuries also fall into this pattern. As may be expected most skateboard injuries occur on weekends.

Location

Fifty-three percent of skateboard injuries occurred in public traffic areas - public roads, footpaths or parking areas. Another 32% occurred in private yards or driveways. Only five cases were reported as occurring on skateboarding ramps but it should be noted that the number of specialised ramps in North and Western Melbourne is unknown and it would be essential to investigate this further before concluding that ramp use is safer (although this is very likely to be the case).

How Skateboarding Injuries Occur

From the information supplied by parents and patients the majority lost control of their skateboard and landed on or against an immovable object or surface (e.g. road or post). Seventy-seven percent of injuries were caused by impact on a hard surface.

Choosing a smooth surface necessary for skateboarding leads many riders to use roads and pathways. As well as the obvious dangers of sharing these areas with vehicles and pedestrians, hazards abound in the form of pot holes, rough edges and the many hard objects such as posts, fences, and concrete guttering which skateboard riders collide into or land on.

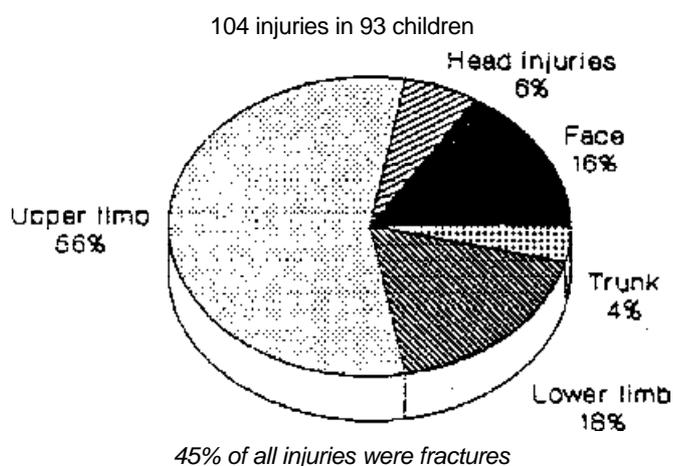
Safety Devices

The data suggest that the wearing of protective equipment is associated with more minor injuries: when protection was not

worn more major injuries occurred. Eighty three children (86% of cases) did not report safety device usage. We do not know how many riders overall use protective equipment, so again, we cannot calculate usage rates. In all 5 cases resulting in concussion no head protection was reported to have been used.

There is a wide range of safety devices available for skateboard use - helmets, knee and elbow pads, and wrist protectors. Helmets tested to the Australian standard for bicycle riding are considered to be sufficient protection for skateboard riders. There is no Australian Standard for the other safety devices and it is not known if imported models are built or tested to safety standards.

Nature of Injury



Treatment

Twelve children were admitted to hospital and 51 required treatment and referral or other follow-up (53%). Injury was insignificant in 3 children.

Cyclist Head Injury Study Uses VISS Data

A study being conducted by Professor Frank McDermott of Monash University and colleagues is examining the injury profile of bicyclist casualties wearing and not wearing helmets with the assistance of VISS data. This research depends on timely and detailed information on bicycle injury cases, particularly when a helmet needs to be retrieved quickly for technical assessment. VISS is able to provide an efficient and reliable list of cases within days of the event.

The severity of injury to different body parts is assessed and the helmets of casualties are examined at Technisearch to determine whether the current standard can be improved. Information on bicycle fatalities is also obtained. Recent Victorian research has shown that head injuries have been reduced by about one third in young cyclists since the highly

successful recent media campaigns and rebate schemes resulted in wearing rates of 65% in primary school children in Melbourne.

Immersion Injuries

There are five cases of near-drowning and one drowning in the VISS (RCH) data at this time. One of the children who presented as a near-drowning died several weeks later from the consequences of the hypoxic insult.

There were equal numbers of boys and girls, and the incidents were evenly spread throughout the day. Expired air resuscitation techniques were performed on the scene. In four out of the six cases, in one case by the child's fifteen year old brother. The mortality statistics do not reflect the full extent of the problem as an important proportion of children who are immersed survive only to suffer serious brain injury requiring long term specialised care. This represents an enormous cost, both social and economic.

These cases highlight the risk indicators for drowning in children described by Professor John Pearn from Brisbane (Why Children Drown; Australian Paediatric Journal 1986; 22:161-4). Children at highest risk are aged 8 to 42 months, and the location of highest risk (in descending order of magnitude) is the child's own yard, neighbour's yard, family bath tub (for infants under 12 months of age), creeks & dams, trenches & irrigation ditches.

Five out of six children were immersed in back yard swimming pools - three of which were in the children's own yards. Four of the five pools were unfenced as far as we know. In two instances, a toddler followed another child into danger. The sixth child (an 8 month old infant) was found floating face up in the bath.

Pool Fencing Legislation - locking the gate after the horse has bolted?

New legislation has been introduced in Victoria effective from August of this year. It does not apply to existing pools so is not retrospective. If a pool is in an apartment complex, the pool itself must be fenced. However, if it is in a private backyard, only the yard or property needs to be fenced. This means that the pool is often easily accessible by the children who live in the house or who are their guests, and therefore does not protect those known to be at highest risk. It is clear that we must have uniform state legislation which requires all pools to be fenced on all sides.

Playground Injuries

Playground equipment is an associated factor in six per cent of all cases in the database. Of this 6% most (80%) occur in public areas such as parks, public playgrounds and school playgrounds. The remaining 20% happen in private yards.

Hazardous Play Equipment Removed

Many of our information requests have been about playground injuries and so we have developed our liaison with the Playgrounds and Recreation Association of Victoria (PRAV). A resident of St Kilda notified VISS about the dangerous design of a particular type of play equipment (a joy wheel, or 'whizzy') in which a child's head had become entrapped. The combined efforts of PRAV, VISS, and the Child Accident Prevention Centre subsequently led to the council removing nine joy wheels within three months.

Steam Engine Hazard

Two children were injured within a few days of each other while playing on the steam train engine in the Edinburgh Gardens, North Fitzroy and presented to the Royal Children's Hospital with (fortunately) minor injuries. This train was already known to us to be a particularly dangerous piece of play equipment for children, especially because of its obvious attraction. This was brought to the attention of PRAV who have notified the local council. It is now being assessed by the council who expressed concern and a willingness to act.

Dangerous School Experiments at Home

Two school experiments which involved the use of petrochemicals were repeated by children in their homes. Both resulted in serious burns which led to hospital admission and subsequent transfer to Royal Children's Hospital. VISS staff obtained detailed descriptions of both incidents from the child and parent which enabled the Child Accident Prevention Centre to take action. The Ministry of Education Safety Officer and the Policy Officer of Science Programs were alerted, in addition to the editors of the Education Gazette, and the Science Teachers Association magazine.

Child Resistant Containers

As noted in the first edition of Hazard, a report was sent out to various agencies involved in pharmaceutical standards and packaging describing the circumstances where children opened child resistant bottles and ingested medications. The response has been one of interest and concern, although child-resistant bottles are just that (i.e. not child-proof).

The functions of the National Therapeutic Goods Committee are to (1) approve child resistant systems and (2) monitor accidental poisonings and make decisions on groups of products to be regulated. They have expressed an intention to monitor this phenomenon and are presently considering the possibility of using NISPP data for a detailed study.

Improved labelling of paracetamol bottles has been implemented recently to point out the need to tighten the lid after use in order to engage the child resistant mechanism.

Alcohol Ingestion

Recently, a nine week old baby was travelling by car with his family from Sydney to Melbourne. The parents stopped at a chemist in Goulburn to buy some distilled water so that they could make up the baby's formula easily and safely whilst travelling. The chemist sold them a new bulk bottle which was intended for his own use (to make up prescriptions). The baby was fed formula made from this mixture for over a day, during which time he became progressively unwell. By the time he was admitted to hospital in Melbourne, he had a blood alcohol of 0.17. The bulk bottle contained an alcohol solution and appears to have been mislabelled at some point. Fortunately the problem was discovered before it became life threatening.

The VISS staff alerted the Victorian Ministry of Consumer Affairs and the N.S.W. Ministry of Business and Consumer Affairs which is currently investigating the matter.

Interpreting the Data

Now that we are beginning to collect data from a defined population, we should begin to think about using rates of injury for comparative purposes, in addition to just 'counts' or numerator information. However, even with rates there are dangers in making some comparisons. Care is required in considering what is the appropriate denominator.

This example illustrates the point with some hypothetical figures.

Skateboard Injuries

Sex	5-9 yr	10-14 yr	all
males	6	54	60
females	6	4	10

Preliminary conclusion: Ten to fourteen year olds, especially boys, are "high risk" for injury, while girls are at "low risk". But let's consider the population denominator (hypothetical), and calculate rates for each of these groups.

population (denominator)

sex	5-9 yr	10-14 yr	all
males	25,000	25,000	50,000
females	25,000	25,000	50,000

The rates are obviously the same and the conclusions don't change. But, surely a more meaningful denominator might be those truly "at risk" of injury, namely those who have skateboards. Let's assume we've done a survey and have the following estimates of the prevalence of ownership within the four age-sex groups.

population at risk (those who have skateboards)

	5-9y	10-14y
males	2% (500)	5% (1,250)
females	0.2%(50)	1% (250)

Now, let's recalculate the risks by taking the numbers of injured children from the first table, and using the new denominators from the table above:

	5-9y	10-14y
males	6/500	54/1,250
females	6/50	4/250

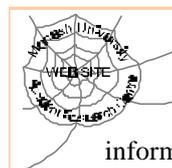
These reduce to the following:

males	1.2%	4.3%
females	12%	1.6%

And the hypothetical risk ratios (or relative risks for girls compared to boys) are:

risk ratios		
f/m	10.0	0.4

Girls aged 5-9 years are at 10 times greater risk than boys of the same age for injury, while older boys have an intermediate risk. These are quite different conclusions to those above, and might suggest quite different directions for research or intervention. An even more sophisticated type of denominator reflects the "exposure" or person-time experience of the subjects at risk for the injury being studied. Surveys of "exposure" (to risk) can be done to estimate this type of denominator. Research conducted in Melbourne by Allan Drummond and colleagues from the Monash University Accident Research Centre looked at the time spent by cyclists on the road and footpath and used this as a basis for calculating rates for injuries per time spent cycling in different traffic environments.



Issues of *Hazard*, along with other information and publications of the Monash University Accident Research Centre, can be found on our internet home page:

<http://www.general.monash.edu.au/muarc>

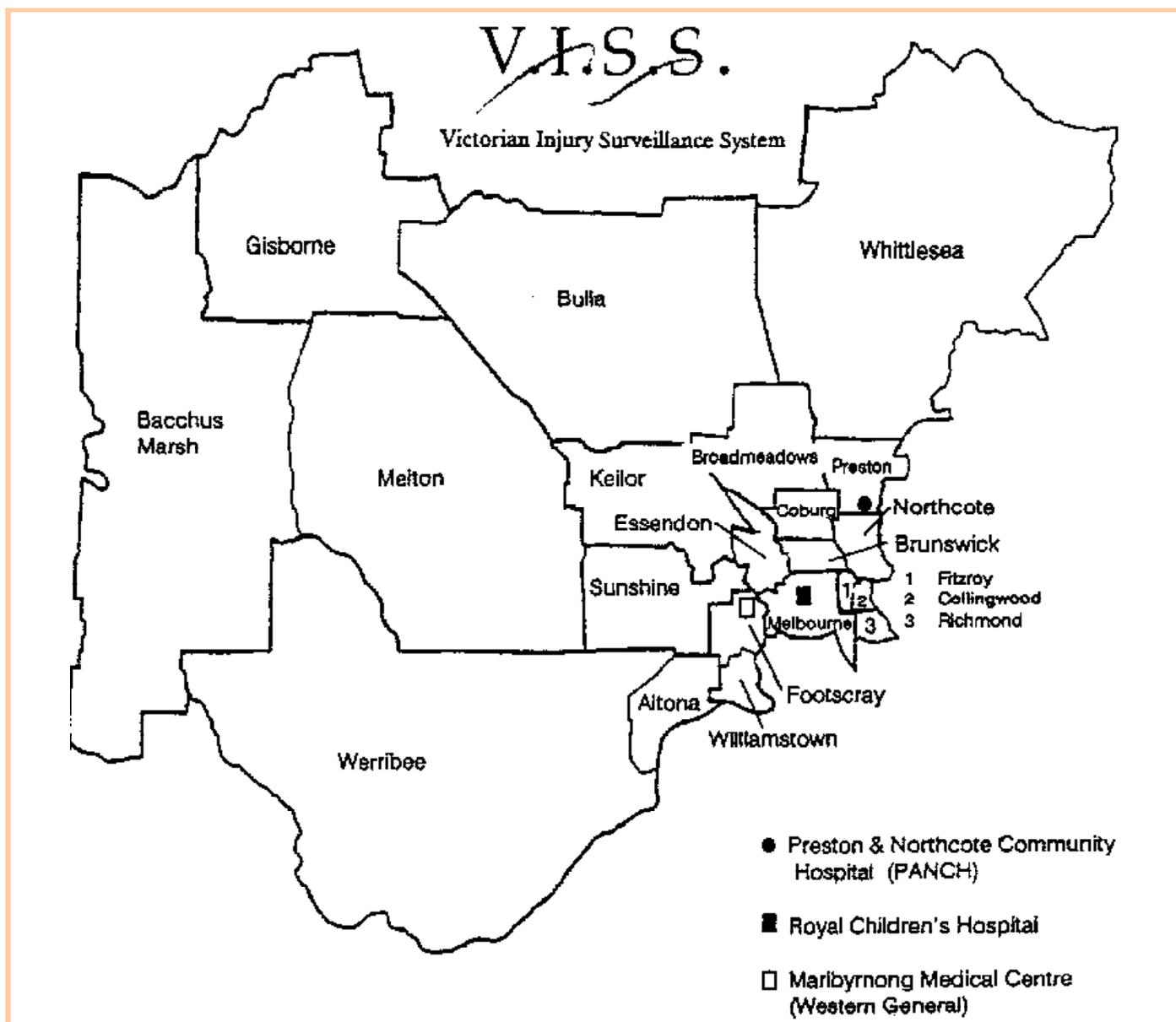
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Using the Database

We are anxious to have people use VISS to ensure that its potential is fully exploited. But it is most important that you first explain what you are trying to achieve with the data. What basic question are you asking? This helps us to select the most appropriate and comprehensive information available for your particular request.

Requests may include specification of: *age*; *sex*; *time* (hour, day, month); *location* (eg. public park, backyard or swimming pool etc.); *activity* (e.g. a specific sport or sports, road traffic accident, playing etc.); *products*, or *factors* (eg. bicycle, dog, car, fire etc) associated with the injury event.

Depending on the question you want to ask, access to Victorian or perhaps national data might be appropriate. If you need to obtain national data, direct contact with the NISPP Secretariat in Adelaide is encouraged.

Requests for VISS data should be addressed to:

Victorian Injury Surveillance System Royal Children's Hospital
Parkville 3052 (*Phone and fax details on previous page*)

Requests for national data from the NISPP database should be sent to: NISPP Secretariat, Epidemiology Branch, PO Box 6, Rundle Mall, Adelaide, 5001. Phone (08) 226-0385; Fax (08) 223-6683. *Provision of data from the national database involves a service charge in some cases.*

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ROYAL CHILDREN'S HOSPITAL MELBOURNE
Injury and Poisons Form
 For all injuries and poisonings

Complete only for FIRST attendance of a particular episode

Date: _____ Time: _____ am/pm

RCH UR No.: _____ Triage Nurse/Clerk

Parent or Guardian

Child's surname: _____ Boy/Girl (circle)

Child's first name: _____

Address: _____ Birth date: _____

Postcode: _____ Telephone: _____

GIVE AS MUCH DETAIL AS POSSIBLE

1. When did the injury occur? Date Time am pm
 2. Where did the injury occur?
 (e.g. in the bathroom shower recess at home, at intersection of Jones and Smith St on the side of the road) (please tick)

3. What was the child doing at the time the injury 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, got into medicine cabinet)

5. What actually caused the injury?
 (e.g. landed on concrete, cut hand on sharp edge of broken toy, swallowed disinfectant and digoxin tablets)

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

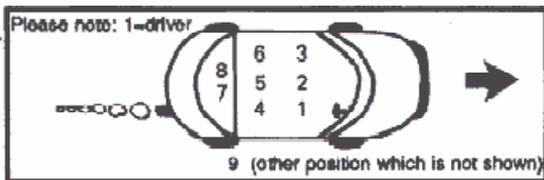
Product Brand or Make
 Type or Model

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

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

Make & Model Year Type of vehicle
 (e.g., Honda Civic) (e.g., sedan, station wagon, hatchback)

9. If the child was in a motor vehicle, show the seating position of the child: CIRCLE THE APPROPRIATE NUMBER ->



10. What language other than English is spoken at the child's home?

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

IMPORTANT: HAND THIS SHEET TO THE DOCTOR WHEN YOU ARE SEEN. Form IS 888J July 1988

Doctor

Doctor's name (print)

Please note: It is the doctor's responsibility to check that the parent has filled in the other side of this form as completely as possible, including child's name, address etc. Please supplement parent's description of injury details where necessary - as much detail as possible.

Complete only for first attendance of a particular episode

1. NATURE OF THE INJURY

<input type="checkbox"/>	<input type="checkbox"/>	Severe
<input type="checkbox"/>	<input type="checkbox"/>	Second
<input type="checkbox"/>	<input type="checkbox"/>	Third

SELECT UP TO THREE CODES

systemic and special injury

- 91 poisonings (thru skin/lungs/mouth etc)
- 93 asphyxiation or respiratory difficulty
- 94 electric shock
- 95 over-exertion, heat/cold stress
- 96 concussion
- 97 dental injury
- 99 no injury detected

soft tissue

- 01 cut/laceration
- 02 puncture
- 03 bite
- 04 superficial abrasion
- 05 penetrating wound
- 06 other wound, incl. 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

bone, tendon or joint

- 20 fracture
- 21 dislocation
- 22 sprain/strain

2. BODY PART

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Skull
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scapula
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wrist

SELECT UP TO THREE CODES

systemic and special injury

000 defined as in Section 1 at left

head

- 101 eye
- 102 ocular 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
- 198 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

lower extremity

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

trunk

- 401 rib(s)
- 402 sacroiliac joint
- 403 spine (inc. cervical), excluding cord
- 404 pelvis
- 405 chest, NEC
- 406 abdomen, NEC
- 407 upper back, NEC
- 408 lower back, NEC
- 409 genitalia
- 410 heart
- 498 other injury to trunk

respiratory tract

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

digestive tract

- 601 mouth internal, e.g. gum, palate
- 602 oesophagus
- 603 stomach
- 604 small bowel
- 605 colon
- 606 rectum
- 607 liver
- 608 spleen
- 609 injury to other internal organs
- 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

3. INTENT OF INJURY

SELECT ONE CODE

- 0 accidental injury (ie, unintentional)
- 1 intentionally self-inflicted, or possibly so
- 2 victim of assault, or possibly so
- 3 unknown intent

4. WHAT YOU DID WITH YOUR PATIENT

SELECT ONE CODE

- 01 no treatment
- 02 treated, no referral
- 10 treated, review later in Emerg./GC
- 03 treated, referred to outpatients
- 04 treated, referred to family doctor
- 05 treated, other referral
- 06 short-stay observation in Emergency
- 07 admitted to hospital
- 08 transferred to other hospital
- 09 DOA or died in Emergency

Note: NEC means "not elsewhere classified"