ABSTRACTS

Eighth International Conference on Emergency Medicine, Boston, Massachusetts, USA, 4–7 May 2000

Oral presentations

Application of the UK A/E Casemix Measure in the year 2000
N F Brayley
The Emergency Department, Colchester General Hospital, Essex.

The UK A/E Healthcare Resource Group (HRG) Casemix Measure and its applications are still evolving but HRG casemix returns will be compulsory for all A/E departments from June 2000.

This oral presentation explains the scientific basis of the current HRG version based on disposal codes and work in hand to further refine the HRG in six sites in the UK before June 2000.

The refinement sites are studying the impact of the nationally agreed 5 point triage scale, time in the department, and certain procedural cost drivers, for example, thrombolytics and expensive radiographic investigations such as IVU, and computed tomography.

The nationally agreed cost model will be displayed, as will a template spread sheet for calculating prospective payments.

The HRG profiles for different departments will be displayed and the implications discussed. HRG profiling can be used for work force planning, identifying service requirements by geographical postcodes, monitoring the changing pattern of referrals to the department by family or general practitioners, monitoring the training and work rate of junior doctors and nurse practitioners.

The limitations of HRGs will also be considered.

Sonoclot coagulation analysis of in vitro dilution of whole blood with colloid and crystalloid solutions
E V Brazil, T J Coats
Academic Unit, Accident and Emergency Department, Royal London Hospital

Introduction—The “Sonoclot analyser” is a device used to measure the quality of a developing clot. It measures the changing resistance to movement imposed by a developing clot on a small probe vibrating at an ultrasonic frequency in a coagulating blood sample.

Aim—The study was designed to test the hypothesis that colloids (gelofusine) haemodilution causes a reduction in clot quality measured by Sonoclot analysis compared with crystalloid (0.9% sodium chloride) haemodiluted blood.

Methods—With local ethics committee approval, each of 12 volunteers had nine fresh blood samples taken from a free flowing upper limb vein and added to solution (colloid or crystalloid) in vitro to make a 10%, 20%, 40%, and 60% solution. One undiluted sample was taken as control.

Results—Rate and peak measurements for control and the various blood dilutions are presented in table 1. There was a highly significant decrease in clot quality for colloid versus crystalloid diluted blood for all haemodilutions.

Conclusion—Blood diluted with gelofusine in vitro causes a reduction in clot quality compared with crystalloid diluted blood.

Part 8 reviews—do we ever learn?
J K Gosnold
Accident and Emergency, Royal Hull Hospitals NHS Trust

In 1973 Maria Colwell died at the hands of her mother’s violent cohabitee, following seven years of involvement with the local authority social services department, as well as being known to the health visitor and family doctor who both had increasing concerns about her health and anxiety being expressed by her school regarding her irregular attendance and failure to learn.

Since then numerous children have died in the United Kingdom in similar circumstances and Statutory Reviews have been held to investigate the events leading up to their deaths—children such as Wayne Brewer, Heidi Cosedhar and Jasmine Beckford.

A decade ago events in Cleveland lead to the Butler-Sloss report and to the requirements for a more formal review procedure under the Child Protection Committee Guidelines and Procedures—the Part 8 review system.

Children still frequently present to accident and emergency (A&E) departments in the United Kingdom with suspicious injuries or signs of neglect and, in some instances, attend repeatedly with similar, often fallacious, histories of illness that should raise a suspicion of Munchausen Syndrome by Proxy. Sadly the failure of the A&E to suspect the diagnosis often prevents repeated ongoing trauma to the child and sometimes their death.

This presentation looks at one such similar case in Hull and reviews the process of the subsequent Part 8 review and the findings.

It became clear that, even in a department where child abuse is historically a high profile issue, children can still be failed.

Can single “first responder” units and priority based dispatch produce a significant impact on the outcome of prehospital cardio pulmonary arrest—a cost effectiveness analysis
T B Hassan*, A Wallwork, T Porter, D B Barnett§
*Department of Accident and Emergency Medicine, Leeds General Infirmary, †University of Leicester, ¶Leicestershire Ambulance and Paramedic Service, ‡Leicester Royal Infirmary

Objectives—To evaluate the resource implications of a tiered “all advanced life support” (ALS) response and criteria based dispatch (CBD) system on the short-term outcome of pre-hospital cardio pulmonary arrest (CPA).

Design—A cost effectiveness analysis based upon a “before and after” emergency medical services (EMS) model design.

Subjects—An EMS system serving a population of 930 000, all adults (age > 18) suffering non-traumatic pre-hospital CPA in 1995 (before the interventions-model I) and 1997 (after the introduction of single first responder units and a CBD system-model II).

Main outcome measure—Cost effectiveness based upon survival to discharge from hospital.

Results—278 patients suffered a pre-hospital CPA in 1995 of whom 48 were resuscitated to a stable return of spontaneous circulation (ROSC) and there were 15 survivors to discharge from hospital. This compared with 326 patients in 1997, with 56 patients having a stable ROSC and 13 survivors to discharge. Using estimates from a meta-analysis on the impact of increased unit hours, taking into account increasing call volume over the period, model II would provide a marginal increase in survival to hospital discharge (4.44% versus 4.47%, corresponding to a gain of 1.3 life years). The increase in EMS costs was estimated as £269 214, of which £2238 was attributed to CPA calls. Including the subsequent A&E and hospitalisation costs for these cases gave an estimated annual increase in costs of £45 976 for CPA cases and a cost effectiveness ratio of £34 091.

Conclusion—Prioritised response (CBD) and introduction of tiered ALS care increased the number of patients requiring ICU care but had no impact on the number of lives saved from pre-hospital CPA. Increased NHS costs were incurred per life year gained.

Right first time—the use of an aluminium filter to improve visualisation of the cervicothoracic junction on the lateral cervical spine radiograph
A MacNamara, S Stevens, P Crowe, J Reynolds
Accident and Emergency Department, Birmingham Heartlands Hospital

Background—In the initial imaging of the cervical spine the trauma victim the lateral radiograph is the most useful plain radiographic projection. The C7/T1 junction, is often poorly demonstrated because of overlying shoulder musculature.

Table 1 Rate and PEAK measurements for control and the various blood dilutions

<table>
<thead>
<tr>
<th></th>
<th>10% Solution</th>
<th>20% Solution</th>
<th>40% Solution</th>
<th>60% Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control CR</td>
<td>COL CR</td>
<td>Control CR</td>
<td>COL CR</td>
</tr>
<tr>
<td>PEAK seconds</td>
<td>982</td>
<td>679</td>
<td>1052</td>
<td>686</td>
</tr>
<tr>
<td>Rate</td>
<td>2.3</td>
<td>21</td>
<td>19.7</td>
<td>24.5</td>
</tr>
</tbody>
</table>

CR = 0.9% Sodium Chloride, COL = Gelofusine.

* p <0.004, **p<0.0371: Wilcoxon’s signed ranks test.
Objective—To determine whether the rate of visualisation of C7/T1 can be improved by the use of an aluminium filter and a high K-V technique when performing the lateral cervical spine radiograph.

Method—An aluminium filter was constructed. A prospective randomised controlled trial was undertaken. The resulting radiographs were assessed blindly by two consultant radiologists. The primary measurement was visualisation of the upper border of T1. Results—160 patients were recruited to the study. There was a 32% (95% CI 15.4%, 48.6%) increase in visualisation of the C7/T1 junction when using the filter. There was also significant improvement in visualisation of spinous processes and facet joints.

Conclusion—Use of a aluminium filter and a high K-V technique greatly increases the rate of visualisation of C7/T1 on the lateral cervical spine radiograph. The implications of this technique are presented.

The ability of cause of accident to predict psychological outcome among male accident and emergency attenders

S M Mason, J Wardrope, G Turpin

The Accident and Emergency Department, Northern General Hospital, Sheffield

This study aimed to evaluate the effect of actual and perceived cause of injury on psychological outcome.

Male accident and emergency attenders admitted to hospital following accidental injury were prospectively followed up at six weeks, six months and 18 months (n=210). Cause of injury was documented according to the Major Trauma Outcome Study criteria. In addition, details about perceived cause of the accident were recorded such as blame for the accident, involvement of alcohol, others being injured at the time and predictability of the accident. Follow up documented psychological symptoms such as anxiety, depression, post-traumatic stress disorder symptoms and psychiatric caseness.

A relation between psychological outcome, cause and perceptions of the accident were investigated using two tailed Pearson's correlation. Variables relating to cause of injury were subjected to linear regression analysis to evaluate their ability to predict psychological outcome. A relation was found between the development of more severe psychological symptoms and those patients who had suffered certain types of injury. In addition, those patients who believed their accident was not predictable, where others were injured, where alcohol was involved and where patients believed they could have prevented the accident were predicted to have a worse psychological outcome.

The new PEP respiratory monitor in the accident and emergency department—The latest answer to a long existing problem

K Murali, C Moulton, D Yates, D Doody*, J Purdy*, B Humphreys*

University Department of Emergency Medicine, Hope Hospital, Salford and *Faculty of Technology, Bolton Institute, Bolton

Objective—To validate the effectiveness of the new Pyro-electric polymer (PEP) respiratory rate monitor in a clinical setting.

Method—A dual phase validation study of the PEP respiratory rate monitor was carried out in a clinical setting. A comparison was made between the respiratory rates measured by the PEP monitor and a capnograph (the standard monitor accepted in this study) in the first phase and the monitor, the dedicated observer and a nurse in the second.

Results—The level of agreement between the monitor and the capnograph was (<2.36 to +1.16 breaths/min (bpm)), correlation coefficient r=0.98. The level of agreement between the monitor and the dedicated observer was lower at (<3.68 to +1.96 bpm), r=0.94. The nurse recordings compared with the monitor agreed at (<8.76 to +1.96 bpm), r=0.90 and with the dedicated observer at (<8.93 to +1.63 bpm), r=0.89.

Conclusion—The PEP monitor compares favourably with the capnograph in the measurement of respiratory rate. The conventional methods of counting respiratory rate do not give an acceptable agreement with the PEP monitor. We believe that the PEP monitor would provide an effective, economical and reliable method of monitoring respiration in non-intubated patients and should therefore supersede the traditional counting of the respiratory rate.

The changing workload patterns in the resuscitation room

B C Paterson, D Coulil, C Halliday, C E Robertson

Accident and Emergency Department, Ninewells Hospital, Dundee

This paper quantifies the changing workload patterns in a single urban teaching hospital accident and emergency department by category and diagnosis over the past three decades.

Methods—Three identical time periods were studied for the years 1966, 1970 and 1988. All patients admitted to the resuscitation room were studied.

Results—Medical admissions were found to be increasing significantly. Although all numbers of admissions are up, cardiac arrest is the significant increase (from 2.8% to 18.5%) with significant falls in overdose (58.3% to 10.6%) and gastrointestinal haemorrhage (11.1 to 1.8%) as a proportion of resuscitation room admissions. (All figures significant at 95% confidence intervals). Trauma admissions fell significantly as a proportion of admissions (62% to 28.4%) with road traffic accident victims the largest group in both 1966 (61.3%) and 1997 (29.1%). (All figures significant at 95% confidence intervals).

Discussion—This study highlights the major implications for health care delivery, and associated staffing and service pressures, posed by...
the increasing number of resuscitation room patients.


2 Baird RN, Noble J, McLean D. Initial intensive paramedic staff that has a licence for use by trained personnel. A P Volans 

The chagining ACI-TIPI score and its significance

S S Tachakra

Department of Accident and Emergency Medicine, North West London Hospitals Trust, London and Department of Cardiovascular Research, New England Medical Center, Boston, USA

The ACI-TIPI (Acute Cardiac Ischaemia Time Insensitive Predictive Instrument) is an instrument that uses proven, validated criteria to provide a predictive score of the percentage probability of acute cardiac ischaemia (acute myocardial infarction and unstable angina).

The ACI-TIPI predictive care has been studied before but little is written about the changing TIPI score and its significance.

We studied 830 patients who presented to the emergency department with chest pain. Repeated ECGs examinations were a unique feature of this project. We noticed that the TIPI score seemed to increase with a developing myocardial infarction and decreased when a myocardial infarction is treated by thrombolytic therapy. We present an analysis of the 830 cases to see the significance of a changing TIPI score and whether there is any value in performing recurrent ECGs.

The effects of pre-hospital nalbuphine on emergency room analgesia

A P Velas

Accident and Emergency Department, Scarborough General Hospital

Nalbuphine is a partial agonist opioid analgesic that has a licence for use by trained paramedic staff in the United Kingdom.

There is a perception that nalbuphine can cause problems with opioid analgesia. A prospective study was carried out of 50 consecutive cases treated with nalbuphine in the field by paramedics working to protocol. Of 50 patients, 45 patients received 10 mg or more of nalbuphine and 39 requested further pre-injection nalbuphine. Of 825 cases recorded, 26 of 50 (52%) had no improvement in their pain symptoms. Thirty two patients required morphine analgesia given by intravenous injection. Sixteen (50%) required more than 10 mg of morphine compared with a 10/131 (8%) requirement for more than 10 mg morphine during the same period for patients not given nalbuphine.

Supplementary techniques were used to achieve pain relief in 20 patients. It is suggested from observation of the time course and pain reporting that after 30 minutes, 26 of 50 patients were in severe pain and that this pain was made more difficult to treat by the presence of nalbuphine in the system.

Ultrasound imaging of forearm fractures in children

D Williamson

Emergency Department, Frenchay Hospital, Bristol

Objectives—A prospective study to investigate whether ultrasonography can be reliably used to demonstrate uncomplicated greenstick and torus fractures in children.

Methods—Children between the ages of 3 and 16 years with a high clinical suspicion of a non-articular, undisplaced forearm fracture were included. Ultrasound imaging of the injury was performed by a specialist registrar in emergency medicine. Standard radiographs of the forearm were then obtained and the patient treated in the normal way. The radiograph was formally reported on at a later date.

Results—There was an absolute correlation between the ultrasound and radiographic findings. The procedure was well tolerated.

Conclusions—Ultrasound is an effective method of detecting uncomplicated forearm fractures in children. The procedure is easy to perform and the images easy to interpret.

Poster presentations

Sports injuries in the western region of Saudi Arabia

M Z Ansari

City Hospital, NHS Trust, Birmingham

Objective—To evaluate the pattern and causes of sports injuries in the western region of Saudi Arabia, to look at the extent, type of injuries and suggest measures for the prevention of such injuries.

Methods—Records of all patients attending an accident and emergency (A&E) department who suffered injuries attributable to trauma were analysed retrospectively. Specifically those with sports injuries. Information regarding age, sex, type of accident, treatment received and outcome was recorded.

Results—Trauma represented 10% of all referrals to the A&E department. Sports injuries were recorded in 21% of patients (852 cases). Of 852 sports injuries only 4% (33) were recorded to be in women. Most injuries were recorded in young males between the age of 11 to 30 years. Injuries of lower limb were found to be commonest, knees 47.5%, ankle joints 23.5%, whereas other sites 29% (including wrists, elbows, shoulders, spine, legs and muscles). The most commonly practised sport causing injury was football in 68% followed by hand ball 14%. Knee and ankle sprains were the most common injury recorded in 33% and 27% respectively.

Conclusions—Sports injuries contribute to nearly 21% of all injuries attributable to trauma. Lack of physical fitness, inappropriate training and games in impropor fields and sports without sports gear were the commonest facts, so predisposing to injuries.

A five year study of high falls in Edinburgh

J P Beale, J P Wyatt, D Beard, A Busuttil, C A Graham

Department Of Accident And Emergency Medicine, Royal Infirmary Of Edinburgh, Scotland

Ann—High falls are a common cause of death and disability. The aim of this study was to obtain an epidemiologically complete picture of all high falls over a five year period in Edinburgh, Scotland.

Methods—Prospectively collected data on hospital survivors and hospital deaths were collected from the Scottish Trauma Audit Group database. Revised Trauma Scores were calculated from physiological data at presentation and Injury Severity Scores calculated from the Abbreviated Injury Scale, 1990 revision. Data on the prehospital deaths were obtained from necropsy reports and detailed police enquiry reports.

Results—There were 341 patients in the study, 82% were male. Some 74% survived to hospital discharge. Sixty three per cent of the total deaths appeared to be suicides. Head and chest injuries were responsible for the majority of deaths. Pelvis, limb and vertebral injuries predominated in the survivors.

Conclusion—Prevention may be the most effective method of reducing prehospital deaths. Abdominal injuries were associated with a poor outcome and survival may improve with immediate surgical exploration in haemodynamically unstable patients.

Bricks and torture

P A Bradley, A F Shenton, M Smith, I Butterworth

The new Accident and Emergency Department at Bradford

Bradford’s Accident & Emergency (A&E) Department in northern England was initially constructed in the 1930s. Until 1990, the department affectionately known as the “shoe box” was housed in a 400 square metre department where we saw 100 000 new patients per annum. This paper charts the building, Machiavellian political intrigues, and media manipulation required to bring our plans for a new A&E department to fruition while working within the confines of the cash constrained National Health Service in England.

The funding was acquired through, brinkmanship, media campaigns, and mastering the arcane art of local politics. Our next challenge was to produce an innovative design for our department, which would work with the problems encountered by other recently developed units. This required a committed team of local clinicians and architects to produce a novel approach to the design process and some political gymnastics to ensure its implementation.

This paper reveals the truth behind the “roller-coaster ride” faced by the consultants involved in planning our new A&E department and the innovative way these problems were overcome.

Maxillofacial and globe injuries in motor vehicle crashes

C N Brookes, S Wang

Blackpool Victoria Hospital, Lancashire and *Trauma Burn Center, University of Michigan, Ann Arbor, Michigan, USA

Improvements in vehicle design have resulted in appropriately restrained occupants having a significantly decreased incidence of facial fractures requiring operative intervention. This is particularly the case if vehicles are equipped with airbags as supplemental restraint systems.

Much of the research regarding the current restraint systems is based though, on analysis of the effects of trauma on crash dummies and cadavers. Unfortunately, “real life” crashes do not always comply to the artificially engineered situations within the laboratory. As a consequence, within North America, the Crash Injury Research and Engineering Network (CIREN) has been established to collect and analyse data on every aspect of the injuries suffered by occupants of motor vehicles in crashes. In addition, the vehicles themselves are examined by expert crash investigators and the occupant’s injuries are then correlated to the deformation of the vehicles involved. Finally, the findings are discussed with engineers from the motor manufacturers who have a direct interest in vehicle safety and design.
A detailed analysis of 20 CIREN cases who presented to a Level One Trauma Centre in North America, between 1996 and 1998, with facial injuries is presented. The aetiology of these injuries is discussed with particular reference to vehicle damage and contact of the occupants with the vehicle interior. Six of the patients who suffered globe injuries are discussed in detail.

The cases described confirm the importance of patients being fully restrained (wearing a three point seatbelt and positive airbag deployment) to achieve maximum protection to ocular-facial structures in high speed collisions. In addition, my analysis confirms previous evidence that airbags, are necessary and useful adjuncts to three point seatbelts. It is postulated though, that patients of short stature may, in certain circumstances, have their ocular/facial injuries exacerbated by vehicle manufacturers not considering the windshield header as a source of facial injury is emphasised. Vehicle manufacturers who wear eyeglasses appear to be at particular risk.

Finally, the frequency of the “A” pillar and the windshield header as a source of facial injury is emphasised. Vehicle manufacturers may, as a result, need to consider further modifications to vehicle interior design to reduce the risk of injury from this structure.

Quantifying risk in elderly people attending accident and emergency with a fall. Results from the Prevention of Falls in the Elderly Trial (PROFET)

J C T Close, R Hooper, S H D Jackson, E Glucksman, C G Swift
Departments of Health Care of the Elderly, Public Health and Accident and Emergency Medicine, King’s College Hospital, London

Falls are a common presenting complaint to accident and emergency (A&E) departments. The Prevention of Falls in the Elderly Trial (PROFET) is a randomised controlled trial that has shown clear benefit of an inter-disciplinary assessment of people aged 65 and over presenting to A&E with a fall in terms of reduction in risk of further falls and preservation of function.¹ The large number of older people presenting with falls necessitates a high risk referral process.

Using data from PROFET, multivariate analysis of independent variables was undertaken to identify those risk factors predictive of further falls in the one year follow up (table 2). The variables found to be predictive of further falls are easily identified in the A&E setting and form the basis of a referral mechanism to evaluate falls in a high risk population.


<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls in previous year</td>
<td>1.5</td>
<td>(1.1, 1.9)</td>
<td>0.001</td>
</tr>
<tr>
<td>Location of index fall:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoors</td>
<td>2.4</td>
<td>(1.1, 5.2)</td>
<td>0.021</td>
</tr>
<tr>
<td>Able to get up:</td>
<td>5.5</td>
<td>(2.3, 13.0)</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>Alcohol intake:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For increase of 10 units/wk</td>
<td>0.55</td>
<td>(0.28, 1.1)</td>
<td>0.34</td>
</tr>
<tr>
<td>AMT:</td>
<td>0.7</td>
<td>(0.53, 0.93)</td>
<td>0.012</td>
</tr>
<tr>
<td>Admitted:</td>
<td>0.26</td>
<td>(0.11, 0.61)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 2 Predictors of further falls in the absence of intervention

Accidental overdose among injecting drug users in Dublin

K Cunningham*, E Keenan, J Barry, M Cotter, M O’Neill, C Quinn, A Lane, B Smyth
AIDs and Drugs Service, Cherry Orchard Hospital, Dublin, Ireland and Accident and Emergency Department, Royal Liverpool University Hospital

Study objectives—Accidental overdose is an important contributor to the increased mortality of injecting drug users (IDU). Misuse of prescribed drugs is frequently reported by IDU. We sought to identify the drugs involved in accidental overdose.

Method—IDU were interviewed as part of a follow up treatment study using a structured questionnaire. Details of current drug misuse, current treatment and overdose history were recorded.

Results—310 IDU were interviewed. Some 258 (83%) were currently taking methadone and 162 (52%) were being prescribed other psychotrophic drugs. Current substance misuse was reported by 180 (58%). A history of accidental overdose was reported by 173 (56%), and 82 (47%) of these had not sought medical attention. The drugs most frequently involved were heroin 109 (63%), benzodiazepines 51 (29%), methadone 27 (16%) and TCADs 18 (10%). Overdose followed misuse of a single substance in 89 (51%) cases. None of the single substance overdoses involved methadone, four (4%) involved TCADs and four (4%) involved benzodiazepines. By contrast, in multiple substance overdoses, methadone was ingested in 27 (37%), TCADs in 14 (18%) and benzodiazepines in 47 (64%).

Conclusions—The majority of IDU have experienced at least one accidental overdose, although only half sought medical assistance. The misuse of prescribed substances, including TCADs, frequently contributed to multiple substance overdoses and is of particular concern in view of their high toxicity.

A survey of needlestick injuries in paramedics and technicians in The West Yorkshire Metropolitan Ambulance Service (WYMAS)

P Gaffney, T Carrigan, G Johnson*
St James’s University Hospital, Leeds and *Yorkshire Metropolitan Ambulance Service

Objectives—To determine the incidence of needlestick injury in paramedics and technicians, to identify situations in which they are likely to occur and to assess knowledge of hepatitis B vaccination status.

Methods—A two page, “closed”, self-administered questionnaire was used to collect data. The questionnaire was distributed to 349 paramedics and technicians, all employed by WYMAS. Results—234 adequately completed forms were returned (response rate 67%). Fifty nine (34.5%) paramedics and 12 (19%) technicians reported having a needlestick injury. Non-resheathing cannulas (ventlons, for example) were responsible for most injuries (61%). Only 83 (48.5%) paramedics and 26 (41%) technicians always wore gloves when handling needles. Interestingly, 18% of paramedics and 24% of technicians stated that they do resheath needles. “Cleaning up”, over-filling of sharps bins and needle use in a moving ambulance were considered times of particular risk for needlestick injury. Two paramedics and two technician injuries were caused by needles belonging to the patient (intravenous drug abusers, for example). Twelve (20%) paramedics who suffered a needlestick injury stated they did not follow the recommended reporting procedure. Four (2%) paramedics and three (5%) technicians stated they had not received a course of hepatitis B vaccination. Fifty one per cent of paramedics and 30% of technicians were unaware of when their next titre check was due.

Conclusions—Needlestick injuries are common among paramedics and technicians. Under-reporting appears to be a problem as it is in hospital practice. Certain risk factors have been identified. Uptake of hepatitis B vaccination is high. However, knowledge of the ongoing need to have titre checks is inadequate.

Evaluation of the Ottawa knee rules in the accident and emergency department

M L Garrity, P Doyle, J Narayanaswamy, A J A Morgan, D F Gorman
Accident and Emergency Department, University Hospital Birmingham, Selly Oak Hospital, Birmingham

Nationally and internationally, there is a desire to make appropriate use of investigations.

The Ottawa knee rules (OKR), a set of guidelines for radiography of the acutely injured knee, state that a knee radiograph is only indicated with any of these findings: aged 55 or older, tenderness of the patella, tender head of fibula, inability to flex knee to ninety degrees or inability to weightbear. This retrospective study reviewed 257 consecutive patients with knee injuries at an accident and emergency department over a three month period. The OKR were applied retrospectively.

One hundred and ten patients met the OKR criteria (42.8%), 82 of these were radiographed (31.9%). One hundred and forty seven patients did not meet the OKR criteria (57.2%), 45 of these were radiographed (17.5%). A total of 18 bony injuries was recorded (7%), all coming from the group that satisfied the OKR criteria.

In this study the OKR were shown to have a sensitivity of 100% and a specificity of 73%.

It can be concluded that application of the OKR results in few, if any, missed fractures and results in fewer radiographs being performed. This represents a considerable saving of resources.

The facts of death

P Glligan, D Hegarty, C Muldoon, M Smith, B Farrell, E Leen, D Barton
James Connolly Memorial Hospital, Blanchardstown

Introduction—This study was prompted by the common question asked by bereaved relatives, “Doctor, what was the cause of death?”

Objectives—To identify the aetiology of death in adults brought in dead or dying in an emergency department (ED).
Methods—A retrospective study of all deaths in the ED of James Connolly Memorial Hospital, Blanchardstown, occurring between 1 January 1998 to 31 December 1998. The study population included all patients who were confirmed dead in the ED or in theatre having failed to respond to emergency surgery. Postmortem records were analysed from the department of pathology and the Coroner’s Office.

Results—During 1998, 104 (0.3%) patients were pronounced dead in the department or in theatre. Eighty (76.9%) of the deceased underwent postmortem study. There were 20 (19.2%) traumatic deaths and 84 (80.7%) non-traumatic deaths. Cardiovascular disease (predominantly ischaemic heart disease and congestive cardiac failure) accounted for the majority of non-traumatic postmortem proven causes of death (63.3%). Other non-traumatic causes included; suicide (13.3%), aortic aneurysm rupture (5%), pulmonary embolus (3.3%) and subarachnoid haemorrhage (3.3%). Road traffic accidents accounted for 70% of traumatic deaths and 13.5% of total deaths. Serious head injury was recorded in 78.6% of patients dying in road traffic accidents. There were also four traumatic suicides. Interestingly, surgical disease accounted for only nine (11.3%) of 80 postmortem proven causes of death but accounted for three (43%) of such deaths in those who were in sinus rhythm on arrival to the ED.

Conclusion—This study may help you counsel the bereaved relatives in EDs, particularly with respect to answering the difficult question of the possible cause of death.

Comparison of insertion of the laryngeal mask and the intubating laryngeal mask by the naive intubator
A Choyce, M S Avidan, C Patel, A Harvey, C Timberlake, N McNelis, E Glucksman
King’s College Hospital, London

Previous studies have shown that unskilled personnel insert the laryngeal mask airway (LMA) more rapidly and reliably than a tracheal tube, and that it provides better ventilation than a facemask. In this study, 75 inexperienced doctors were timed inserting the LMA and the intubating laryngeal mask (ILM) in a simulated resuscitation situation using cads. Adequacy of ventilation was assessed. The ILM intubators were asked also to intubate the trachea via the ILM. The ILM was inserted faster (p<0.05) with a greater proportion achieving adequate ventilation after their first attempt at insertion (p<0.05). Tracheal intubation via the ILM was completed successfully by 67% (52 of 75) of participants. In a questionnaire, participants stated that the ILM was the easier mask to use and the preferred device in an emergency situation. This study does not support the use of the ILM as a conduit for tracheal intubation by the non-anæsthetist; however, the results strongly suggest that practitioners, inexperience in airway management, should use the ILM rather than the LMA for emergency ventilation.

Rapid sequence intubation in accident and emergency departments in Scotland—preliminary results
C A MacLennan, S B Tholoule, E Docherty, A P Mattick, J Brittfite, M A Johnson, T R J Parke Scottish Trauma Audit Group, Royal Infirmary of Edinburgh

Introduction—In Scottish hospitals rapid sequence intubation (RSI) may be performed by a suitably trained accident and emergency (A&E) doctor or by an anæsthetist. Anaesthetic expertise within the training grades of both specialties is variable. This study aims to ascertain if RSI can be performed safely by A&E staff and to compare the outcomes for groups of patients who undergo RSI by different specialties.

Methods—A prospective, multicentre observational study in seven teaching hospitals in Scotland. The study started in January 1999.

Results—Of the 229 patients entered into the study in the first six months, 107 (46.8%) were trauma patients. Eighteen (5.5%) were medical and 101 (71.4%) were “other”. A&E staff performed 126 (55.8%) of first intubations. Training grade doctors performed 180 (78.6%) of intubations. There were 129 grade I intubations, 58 grade II, 18 grade III and 8 grade IV (16 missing values). Thirty nine patients had their airway secured on the second attempt and a further five patients required three attempts. There was no statistically significant difference in complication rates between the two specialties.

Discussion—Intubation. It is likely that appropriately trained A&E staff can undertake RSI safely on the basis of the first six months of this study. Further evidence will be available as the study progresses and differences in practice between hospitals will be presented.

The association between social deprivation and trauma in Scotland
A Corfield, J Henry, P Grant
Western Infirmary, Glasgow and Western Infirmary, Glasgow/Scottish Trauma Audit Group, c/o Accident & Emergency Department, Edinburgh Royal Infirmary

Objectives—To investigate possible links between trauma and social deprivation in Scotland.

Design—Prospective observational study, using a national trauma database.

Setting—24 Scottish hospitals covering approximately 98% of the population.

Participants—The study was conducted over a 29 month period from the 1 August 1996 to 31 December 1998. A total of 14 927 patients who fulfilled the Scottish Trauma Audit Group (STAG) entry criteria during this time period were included in the study. Domicile postcodes were recorded from which a Carstairs deprivation category (1 most affluent to 7 most deprived were calculated). Main outcome measures—Mechanism of injury, length of stay, severity of trauma and mortality.

Results—13 021 (87%) patients had Scottish postcodes recorded and were thus assigned appropriate deprivation categories. Some 38.2% (4794) of patients were in the most deprived group (categories 6, and 7) compared with 32.8% (1.6 million) of the Scottish population as a whole (χ² = 171.18, p < 0.001). Of those sustaining penetrating trauma (626) a higher than expected proportion were from deprivation categories 5–7 (61%, χ² = 145.42, p < 0.001). A higher than expected proportion of the seriously injured group (ISS 15, 1602 patients) came from deprivation categories 5–7 (43%, χ² 18.107, p<0.001). Average length of stay and mortality did not differ significantly for any deprivation group.

Conclusions—The socially deprived are more likely to sustain significant trauma in Scotland, and are at greater risk of severe injury. Overall outcomes in terms of mortality however are not adversely affected.

Efficacy of gastric decontamination in paracetamol (acetaminophen) overdose
P Gupta, D B Wijetunge, S Premachandran
Accident and Emergency, St George’s Hospital, London

Aim—to compare the efficacy of gastric lavage and activated charcoal in limiting the absorption of paracetamol in overdose.

Method—in this prospective randomised trial, patients, admitted to the accident and emergency department, four hours of ingestion of more than 5 grams of paracetamol, were allocated randomly in one of the two treatment groups: (1) gastric lavage and charcoal, (2) charcoal only. Plasma paracetamol concentrations were measured before treatment, and after treatment at 60, 90 and 120 minutes after the first sample. Rate of fall in paracetamol concentration was used to measure the efficacy.

Results—Of 32 patients, 21 received charcoal, 11 were treated by gastric lavage and charcoal. Plasma concentrations of paracetamol were measured for each group and plotted on a graph. The fall of paracetamol concentrations was found to be greater in the patients treated with charcoal. This was not statistically significant.

Conclusion—Charcoal alone is equally effective as gastric lavage and charcoal in limiting the absorption of paracetamol in overdose within four hours of its ingestion.

A diagnostic care pathway for the management of suspected deep vein thrombosis
K L M Henderson, W Coode
Accident and Emergency Department, Homerton Hospital, London

Suspected venous thrombosis is a common problem presenting to an emergency department. Clinical examination is highly non-specific but the danger of the diagnosis and the effectiveness of treatment means that any suspicion of venous thrombosis mandates further action. Thus in most series on objective testing, about 75% of patients do not have venous thrombosis.

In this situation resources are used most efficiently if sensitive tests can be performed as near to the point of presentation as possible. Sensitive tests effectively “rule out” a diagnosis.

We have developed a care pathway that combines a clinical pretest probability score with a physical test for venous occlusion (strain gauge plethysmograph, AMT Venoscope) and a haematological marker for the degradation of fibrin clot—D-dimer (SimpliRED). All of these tests can be performed in the emergency department by our own staff. So far we have been able to safely rule out deep vein thrombosis at presentation in 50 of 110 patients. Patients in whom the diagnosis cannot be ruled out are sent for further investigation.

Humanitarian support: designing, building and equipping an emergency department in Kosovo
T J Hodgetts
Accident and Emergency Department, Frimley Park Hospital, Camberley, Surrey

Daily in 1999 the Specialty Adviser A&E UK was asked by the Department for International Development to design, build and equip a new emergency department for the University Hospital of Prizren, Kosovo. This task was secondary and additional to providing an
emergency medical service to KFOR troops at 22 Field Hospital RAMC, and to providing life and limb saving resuscitative treatment to the local population. The department was to be situated on the ground floor of an existing building. Using a team of specialist A&E nurses the Scottish Trauma Audit Group (STAG) for a single department were analysed. Outcome is compared with 68% of controls (p = 0.0001) and 22% at high risk of suicide. Eighty percent of children wearing their helmet the last time they rode their bike (p < 0.001). This difference was found to be confined to children under 8 with 23% of injured children wearing a helmet compared with 68% of controls (p = 0.0001) and was magnified among those children who owned a helmet (51% v 86%, p < 0.00001). This finding was independent of sex or social deprivation.

Conclusion—Children under the age of 8 who do not wear a helmet are at particular risk of bicycle related injury, especially if they own a helmet. Injury prevention strategies should target these children in particular.

The prevalence of mental health disorder in accident and emergency

A J Lewis, E Glucksmann, D Alpers
Guy’s, King’s and St Thomas’s School of Medicine, King’s College London

Much work has been devoted to identifying the levels of emotional disorder in primary care but little work has been carried out looking at emotional disorder in patients presenting to the accident and emergency (A&E) department, particularly those presenting with minor complaints. We examined with self rating questionnaires 550 patients presenting to the Department of Accident and Emergency at King’s College Hospital who were triaged to an accident and emergency (A&E) for radiography in ankle and midfoot injuries in children.

Objectives—To determine whether Dermabond, is a viable alternative to Steristrips in the closure of children’s lacerations. Results—Table 3 gives the results.

<table>
<thead>
<tr>
<th>Control (n=177)</th>
<th>Intervention (n=147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex ratio (M : F)</td>
<td>97 : 80</td>
</tr>
<tr>
<td>Age range (Mean)</td>
<td>1–8 (9)</td>
</tr>
<tr>
<td>Percentage radiographed</td>
<td>82%</td>
</tr>
<tr>
<td>Satisfied OAR and radiographed</td>
<td>96%</td>
</tr>
<tr>
<td>Satisfied OAR only</td>
<td>34%</td>
</tr>
<tr>
<td>Satisfied OAR and had a fracture</td>
<td>28%</td>
</tr>
<tr>
<td>Did not satisfy OAR but had a fracture</td>
<td>7%</td>
</tr>
</tbody>
</table>

Sensitivity: 98%. Specificity: 18% (assumes no missed fractures in the patients radiographed.

A comparison of Steristrips versus glue for the closure of lacerations in a paediatric accident and emergency department

A Mattick*, G R Clegg, T F Beatiss, T Ahmed
Royal Infirmary of Edinburgh and Royal Hospital for Sick Children, Edinburgh

Objectives—To evaluate the Ottawa ankle rules for radiography in ankle and midfoot injuries in children.

Methods—The notes and radiographs of all children aged 13 or under presenting with an ankle or midfoot injury to the accident and emergency departments of King’s College Hospital and the Royal Belfast Hospital for Sick Children during a two month period were collected and analysed. All clinicians were given a teaching session and a help sheet on the use of the Ottawa ankle rules (OAR) then the audit was repeated for the notes from the subsequent two months.

Results—Table 3 gives the results.

<table>
<thead>
<tr>
<th>Control (n=177)</th>
<th>Intervention (n=147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex ratio (M : F)</td>
<td>97 : 80</td>
</tr>
<tr>
<td>Age range (Mean)</td>
<td>1–8 (9)</td>
</tr>
<tr>
<td>Percentage radiographed</td>
<td>82%</td>
</tr>
<tr>
<td>Satisfied OAR and radiographed</td>
<td>96%</td>
</tr>
<tr>
<td>Satisfied OAR only</td>
<td>34%</td>
</tr>
<tr>
<td>Satisfied OAR and had a fracture</td>
<td>28%</td>
</tr>
<tr>
<td>Did not satisfy OAR but had a fracture</td>
<td>7%</td>
</tr>
</tbody>
</table>
The Waterford Prognostic Scoring System for soft tissue sports injury to the knee joint—a pilot study

B Mc Cann
Royal Liverpool University Hospital

Objective—To devise a scoring system for sporting injuries to the knee, which could be used in the emergency department to identify those patients who would return to pre-injury sporting level within eight weeks.

Methods—All knee injuries over a three month period were allotted a score based on 27 variables—derived from age, surface type, history of injury, symptoms and clinical examination findings. Patient outcome at eight weeks was gauged simply by return to competitive sport versus persisting morbidity.

Results—39 knees were reviewed. Eighteen were “back to sport” within eight weeks (mean score 6.38 (SD 2.38)). 21 remained “injured” (mean score 13.28 (SD 2.88)). The final score in these groups proved to be highly significant (p<0.0001). Moreover, using only 5 of the 27 variables—surface type, loaded twist, swelling (as a symptom), positive Lachman test and presence of an effusion—the system retained a high degree of specificity.

Conclusions—Using the system, the emergency physician can predict the outcome of sporting injury to the knee joint in terms of return to competitive sport within eight weeks versus persisting morbidity. The system can be used to reassure on the one hand, and on the other to increase the import of early orthopaedic evaluation for the “injured” group.

Accidental hypothermia: the effects of rewarming on plasma pH, ionised calcium, ionised magnesium, and serum parathyroid hormone
J J McNerney, B Breakell, W Madira, T Davyes, P A Evans
Accident and Emergency Department, Leicester Royal Infirmary

Background—Accidental hypothermia though uncommon, is associated with appreciable mortality, and the underlying physiological mechanisms remain obscure. Alterations in divalent cations are found in other forms of hypothermia, and the underlying physiological mechanisms remain obscure. Alterations in divalent cations are found in other forms of hypothermia, and the underlying physiological mechanisms remain obscure. Alterations in divalent cations are found in other forms of hypothermia, and the underlying physiological mechanisms remain obscure.

Methods—Patients were rewarmed with warm blankets and pre-warmed crystalloid fluid. Venous samples were collected at presentation, during rewarming, and at 24 hours.

Results and Conclusions—Detailed results from a prospective, randomised controlled trial evaluating an infusion of potassium, insulin and glucose as a treatment for reversing the effects of intoxication with alcohol remain to be published.

Tables

<table>
<thead>
<tr>
<th>Decision time</th>
<th>Patients admitted</th>
<th>Median in minutes</th>
<th>IQR</th>
<th>DoG cost (£120)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;E clinician</td>
<td>34</td>
<td>47.5 (25.0–80.0)</td>
<td>150.0 (108.8–210.0)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>On call medical team</td>
<td>142</td>
<td>130.0 (103.8–150.0)</td>
<td>235.0 (180.0–320.0)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

The Alcohol Wake-Up Study—a randomised controlled trial evaluating an infusion of potassium, insulin and glucose as a treatment for reversing the effects of intoxication with alcohol

H D M Poncina, P Ransom, J Ryan
Royal Sussex County Hospital, Brighton

Introduction—There are to date no effective “amethystic agents” for acute alcohol intoxication. This study evaluates one proposed treatment.

Aims—To evaluate the effect of an infusion of potassium, insulin and glucose on Glasgow Coma Scale (GCS) in patients acutely intoxicated with alcohol.

Methods—This was a prospective, randomised, double blind controlled trial. Inclusion criteria were: a GCS of 12 or less, alcohol as cause of acute intoxication, normoglycaemia and age 18 to 65 years. Exclusion criteria were evidence of head injury, focal neurologic signs or pregnancy. Patients received either an infusion of 1000 ml of 10% dextrose containing 20 mmol potassium and 20 units of Actrapid insulin over one hour or 1 litre of 0.9% normal saline. GCS was measured hourly. The time taken for the GCS to reach 15 was measured. Serial measurements of blood alcohol concentration, glucose, electrolytes and toxicology screening were made.

Results and Conclusions—Detailed results from 80 patients recruited into the study will be available at the conference. A mixture of intravenous potassium, insulin and dextrose may be an effective agent in reversing the effects of alcohol toxicity.

Headaches: can we improve our assessment and management?

L Somers*, P Thompson, R Brown
*University Hospital Lewisham, London and King’s College Hospital, London

Introduction—Headaches remain a common presenting complaint to accident and emergency (A&E) departments. A careful history is the key to diagnosis. We have evaluated our assessment of patients presenting with headache and have established a proforma to assist and improve our initial diagnosis and management. We aim to introduce agreed treatment protocols for the health region and are in the process of developing a scoring system.

Methods—A retrospective analysis of all non-traumatic headache patients was performed.
Medical student education through tele-eradiology
S S Tachakra
Department of Accident and Emergency Medicine, North West London Hospitals Trust, London
Radiographs of 2133 patients who were radiographed out of a total of 4000 were transmitted by medical students from a MATS (Minor Accident and Treatment Service) to a main emergency department. The students wrote down their own diagnosis and their perception of their level of knowledge before tuition.

The accident and emergency consultant in the main department taught the medical students, using the whiteboarding facility if necessary, used models, pictures and surface anatomy as necessary. Tuition was supplemented by directed personal study and other forms of leaving.

Medical students marked their past tuition level of comprehension, the quality of learning with teleradiology, and any improvements they would encourage. We present how the students marked all the above.

Can we learn from ultrasound practice around the globe?
P Thompson, E Glucksman
Department of Accident and Emergency Medicine, King's College Hospital, London
Introduction—The role of ultrasound as performed by emergency physicians continues to be a keenly debated topic. We investigated the current use of ultrasound within three emergency departments at different levels of ultrasound expertise in London (A), Chicago (B) and Sydney (C). The objective was to determine the most appropriate use of ultrasound by emergency physicians.

Methods—Three emergency departments (A, B and C) with a full range of specialist facilities were evaluated by a single doctor for one month. Each department was part of a tertiary referral teaching hospital with a responsibility for trauma. Merit numbers, time for ultrasound, confirmatory investigations, quality control and department education were considered.

Results—The number of ultrasound scans performed—A 63, B 242 and C 26 corresponded to the number of ultrasound practitioners available 2, 7 and 3 respectively together with different indications. Confirmatory investigations were performed in A 72%, B 45% and C 100%.

Discussion—Ultrasound expertise varied between the departments with C concentrating on free fluid following blunt trauma. Department B added abdominal pain and complicated first trimester patients and C additional deep venous thrombosis exclusion.

Enthusiasm for ultrasound is increasing around the globe. Can we learn from ultrasound practice around the globe?—The majority of patients presenting to the A&E departments with headaches had a benign cause. For those with more serious pathology, the proforma emphasised key features to raise the clinician’s suspicion, namely speed of onset, altered mental state, vomiting and photophobia.

Conclusion—The introduction of a proforma has improved history taking and accuracy, diagnosis, ensuring those with serious pathology get appropriate investigation, treatment and follow up. For those patients with benign headaches, who are the majority of those attending A&E departments, the diagnosis has been improved with treatment becoming standardised across the region.

Summary
1 Significantly more patients (p=0.001) were discharged completely from the A&E department (71.6%) compared with the MIU (51.6%).
2 Significantly more patients (p=0.001) were brought back to returns clinics from the MIU (12.1% in all 8.9% to the MIU and 3.2% to the A&E department) compared with the A&E department (5.6%).
3 Significantly more patients (p=0.001) were referred to their general practitioner from the MIU (11.1%) compared with the A&E department (4.6%).
4 3.8% of patients were referred directly from the MIU to the A&E department.
5 Significantly more patients (p=0.001) were referred form the MIU to fracture clinic and eye casualty than from the A&E department.

Conclusion—The concept of an “A&E work unit” was devised and the cost of an “A&E work unit” for both an A&E department and an MIU was calculated from the total data set. It was made that in finance terms one admission was equivalent to four non-admissions. The cost of an “A&E work unit” for the A&E department was £26.08 and for the MIU was £31.94.

Cost of extra referrals: From these figures the increased cost of the treatment of minor injuries at a MIU compared with an A&E department per patient seen was:
1 Increased cost from extra GP referrals £0.45
2 Increased cost from extra returns to MIU £0.16
3 Increased cost from extra returns to A&E £0.35
4 Increased cost from immediate A&E referral £0.56
5 Increased cost from extra fracture clinic referrals £0.34
6 Increased cost from extra eye casualty referrals £0.11

Total increased cost per patient seen at MIU £1.97

Summary—From these data a nurse led MIU was substantially more expensive from a Health Service perspective than a traditional A&E department. This additional expense was partly attributable to significantly greater returns and referrals rates for the MIU compared with the A&E department.

British Association for Accident and Emergency Medicine Conference, Cambridge, 4–6 April 2000
Intramuscular ketamine sedation of paediatric patients in the accident and emergency department

A Izquierdo- Martin, K Whitwell, J Dwyer, A Fogarty
Royal Free Hospital Accident and Emergency and Royal London Hospital Paediatric Accident and Emergency

Background—The use of ketamine for paediatric sedation in the emergency department has become increasingly popular in the United States. In the UK its use is much more limited in the accident and emergency (A&E) setting; probably because of misinformation about its safety.

Objectives—To determine the efficacy, safety and recovery times with intramuscular ketamine sedation in paediatric patients requiring brief, painful procedures in the A&E department.

Methods—This prospective study included all paediatric patients given intramuscular ketamine in two London teaching hospitals between September 1999 and January 2000. Inclusion in the study was determined using a modified protocol based on a literature review. The initial ketamine dose was 4 mg/kg combined with atropine (10 µg/kg). A repeat ketamine dose of 2 mg/kg was used if sedation was considered inadequate after 5 to 10 minutes. The procedure was carried out in an area with suction, oxygen and equipment for advanced airway management and by a physician who was adept at airway management. Intravenous access was not required.

Results—Thirty patients, ranging in age from 1 to 9 years old, were enrolled in the study. Mild agitation during the procedure was noted in two cases and vomiting during recovery in another two cases. Complications included aspiration of activated charcoal. Administration of charcoal may be improved by the pre-hospital administration of activated charcoal. Information was gathered using a standardised abstraction form. The times collected may partly be explained by differences in presenters' complaint between the two groups. However, the 40% of patients discharged without follow up suggests that NHS Direct may be overly cautious in its selection of cases that require an emergency ambulance.

Conclusions—Intramuscular ketamine is a consistent effective method of producing a rapid, brief period of profound sedation and analgesia in children in A&E. While maintaining airway patency and reflexes, together with cardiovascular stability, no serious complications were noted in our study. Although a small number of patients were studied, our results are in line with larger studies reported by other emergency departments. Because of its wide margin of safety, ketamine is used regularly in operating rooms throughout the developing world with minimal patient monitoring, frequently with a single physician performing the surgery and supervising the sedation. Airway management techniques are routine skills in emergency medical practice and this provides the necessary expertise in the management of potential airway complications. We conclude that intramuscular ketamine may be administered safely by emergency physicians to facilitate paediatric procedures, with a reduction in the number of paediatric admissions and use of general anaesthesia for simple procedures.

Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>NHS Direct (n=31)</th>
<th>Non-NHS Direct (n=232)</th>
<th>p Value</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex (SD)</td>
<td>50 (55%)</td>
<td>120 (55%)</td>
<td>0.622</td>
<td>χ²</td>
</tr>
<tr>
<td>Mean (SD) age (y)</td>
<td>46 (22.4)</td>
<td>52.2 (25.7)</td>
<td>0.033</td>
<td>t test</td>
</tr>
<tr>
<td>Duration of symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–24 h</td>
<td>53 (58%)</td>
<td>189 (82%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–7 days</td>
<td>30 (33%)</td>
<td>36 (15%)</td>
<td>&lt;0.001</td>
<td>χ²</td>
</tr>
<tr>
<td>8–28 days</td>
<td>7 (8%)</td>
<td>4 (2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;1 month</td>
<td>1 (1%)</td>
<td>3 (1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manchester Triage Category (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposal (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admit to hospital</td>
<td>5 (16%)</td>
<td>23 (32%)</td>
<td>0.014</td>
<td>χ²</td>
</tr>
<tr>
<td>Transfer to another hospital</td>
<td>2 (2%)</td>
<td>27 (28%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge with follow up</td>
<td>2 (2%)</td>
<td>25 (24%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge without follow up</td>
<td>44 (40%)</td>
<td>74 (32%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not wait</td>
<td>1 (1%)</td>
<td>6 (3%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Activated charcoal: is there a role for pre-hospital administration?

S Thakore, N Murphy
Raigmore Hospital, Inverness

Methods—Ambulance forms and case notes were reviewed in all patients presenting to A&E by ambulance after ingestion of either charcoal or poison. Information was gathered using a standardised abstraction form. The times collected were: time of ingestion, time of call to ambulance control, time picked up, time of arrival in A&E and time seen by doctor.

Results—134 patient records reviewed to date. Fourteen have been excluded because of incomplete data on report forms or case notes. Figure 1 shows the distribution of journey times to A&E. Figure 2 shows the proportion of people who are actually seen in the same time frame in which they are picked up. Thirty nine per cent of patients were picked up by an ambulance within one hour of overdose, only 8.5% of these were seen by medical staff within an hour of ingestion. Fifty nine per cent were picked up within two hours of ingestion of which 65% were seen by medical staff within this time frame.

Conclusions—A significant number of patients are picked up by ambulance within an hour of ingestion, however very few are then seen by someone able to prescribe charcoal within this time frame. The administration of charcoal results in few side effects provided the patient who had called NHS Direct. All the A&E records were then scrutinised for basic demographic data and the following characteristics: duration of symptoms before dialling 999, triage category on arrival in A&E and disposal of patient. Patients were excluded if they were dead on arrival or had been advised by their general practitioner (GP) to dial 999. The study was approved by the chairmen of the relevant Research Ethics Committees. Statistical advice was also obtained and SPSS version 8 was used for the analyses.

Results and Conclusions—During the study period 91 people, of the 28 000 who called NHS Direct, were brought by emergency ambulance to these three departments. Of the comparison group (260 60 cases), 28 were excluded from the study. There were notable differences in presenting complaint between the two groups and in particular, trauma was less common among the NHS Direct patients (6.6%) compared with those who had self dialled (37.5%). Other results are shown in the table 1.

Thus, patients who had first called NHS Direct were younger and had endured their symptoms for longer; they were less likely to be admitted, and if discharged, were less likely to have follow up arranged. These findings may partly be explained by differences in presenting complaint between the two groups. However, the 40% of patients discharged without follow up suggests that NHS Direct may be overly cautious in its selection of cases that require an emergency ambulance.

Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>NHS Direct (n=91)</th>
<th>Non-NHS Direct (n=232)</th>
<th>p Value</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex (SD)</td>
<td>50 (55%)</td>
<td>120 (52%)</td>
<td>0.622</td>
<td>χ²</td>
</tr>
<tr>
<td>Mean (SD) age (y)</td>
<td>46 (22.4)</td>
<td>52.2 (25.7)</td>
<td>0.033</td>
<td>t test</td>
</tr>
<tr>
<td>Duration of symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–24 h</td>
<td>53 (58%)</td>
<td>189 (82%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–7 days</td>
<td>30 (33%)</td>
<td>36 (15%)</td>
<td>&lt;0.001</td>
<td>χ²</td>
</tr>
<tr>
<td>8–28 days</td>
<td>7 (8%)</td>
<td>4 (2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;1 month</td>
<td>1 (1%)</td>
<td>3 (1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manchester Triage Category (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposal (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admit to hospital</td>
<td>5 (16%)</td>
<td>23 (32%)</td>
<td>0.014</td>
<td>χ²</td>
</tr>
<tr>
<td>Transfer to another hospital</td>
<td>2 (2%)</td>
<td>27 (28%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge with follow up</td>
<td>2 (2%)</td>
<td>25 (24%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge without follow up</td>
<td>44 (40%)</td>
<td>74 (32%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not wait</td>
<td>1 (1%)</td>
<td>6 (3%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The frequency of presentation of personal child health records to the accident and emergency department

P Doyle, I K Dukes

Accident and Emergency Department, Russell’s Hall Hospital NHS Trust, West Midlands

Personal Child Health Records (PCHR) have been issued to all new parents in the Dudley area since 1991. These are portable medical records, providing important information to parents and medical staff. In 1997, we studied the frequency of presentation of PCHR to our accident and emergency (A&E) department.

The parents/guardians of all children under five years of age, presenting to A&E with minor or moderately severe illness/injury, were offered a simple questionnaire. This questionnaire had been modified after a pilot study in the same department.

During the study period there were 640 paediatric attendances in the under 5 years group. A total of 253 questionnaires were completed. Of parents who completed the questionnaire, 98% recorded receipt of the PCHR.

Of the study group, 95% were still in possession of the PCHR. However, at the A&E attendance, only 13% of parents had brought the PCHR with the child. There was a variety of recorded reasons for not bringing the PCHR to A&E. Disappointingly, 20% of respondents felt the PCHR to be of no benefit.

This study shows that PCHR are underused, with respect to A&E attendances. The importance of these records should be more widely promoted.

Audit of distribution of head injuries presenting to accident and emergency department according to severity, disposal and the length of hospitalisation

T Santarius, A Kulkarni, M Choudry, S Ellis, C Park, A R MacNamara

Accident and Emergency, Birmingham Heartlands Hospital

In its report, The Royal College of Surgeons of England Working Party on the Management of Patients with Head Injuries suggested major changes, involving both its clinical and organisational aspects. Under the new guidelines, head injured patients should be managed by accident and emergency (A&E), neuroscience and paediatric/paediatric surgery departments. This will put substantial demands on A&E personnel and equipment resources. To help to estimate the qualitative and quantitative increase in service by our A&E department we have conducted a descriptive study of the flow of head injured patients.

Over the period of three weeks, for each patient presenting to our A&E department (annually 95 000–100 000 patients) a choose n’tick audit form assessing time and mechanism of injury, symptoms, Glasgow coma scale (GCS), focal neurological deficit, radiology and disposal was filled by the examining doctor or nurse practitioner. The length of stay was determined from patients’ case notes and/or hospital computer network. Minor, moderate and severe head injuries were defined as GCS 15–13 with no focal neurological deficit or skull fracture, 12–9 and less than 10, respectively.

Over the audit period 509 patients presented with head injuries. Of these 89 (17%) patients were admitted; 55 (62%) to A&E observation unit, 17 (19%) by paediatrics, nine (10%) by trauma and orthopaedics (T&O), three (3%) to ITU, three (3%) by...
medical teams and one patient by maxillofacial team. There were no patients transferred to neurosurgical unit during the study period. All paediatric patients sustained minor head injuries and stayed in less than 24 hours.

Closing the loop: feedback to accident and emergency SHOs on their referrals to hospital specialists

K Cunningham, G Narendra, N Burchett Accident and Emergency Department, Queen Elizabeth Hospital, Kings Lynn

Abstracts

Discussion—Written case-specific feedback to A&E SHOs on their referrals to specialists could encourage learning, support individual continuing professional development, and improve patient management. Scrutiny of this information by the SHO’s trainer could assist in competency-based assessment of the SHO’s performance, and support clinical governance.

Airbag injuries in Britain—coming to an accident and emergency department near you

K Cunningham, P Burdett-Smith Department of Accident and Emergency Medicine, Royal Liverpool University Hospital

The introduction of airbag technology has been shown to significantly reduce mortality and morbidity in motor vehicle crashes. However, the airbag like the seat belt, produces its own spectrum of injuries. With the increasing prevalence of airbags in the UK, airbag associated injuries will be seen more frequently in our accident and emergency department. Most are minor, but in certain circumstances severe and fatal injuries can result. Hitherto, reports of fatalities have largely been from North America and the first case from the UK has just been published. 1 This case involved a female driver who was fatally injured when her airbag deployed in a moderate impact frontal collision where such severe injury would not normally have been anticipated. Since then, two further fatalities have occurred in this country where the airbag has been implicated as a contributing factor. These cases have not yet been reported in the medical literature. The details presented here were unique, and the injury sustained will be illustrated. The history and spectrum of airbag associated injuries will be briefly outlined. The risk-benefit ratio will be discussed and predisposing factors for airbag injury highlighted.

Analgesia use in children attending accident and emergency after an injury

S Thorp, M Mason, W Moody-Jones Accident and Emergency Department, Sheffield Children’s Hospital

Aim—To determine the pattern of analgesic administration to children attending the accident and emergency (A&E) department after an injury.

Methods—A prospective study was undertaken over a four week period in February 1999 of children presenting to the A&E department after an acute injury. A questionnaire was given to the child’s parents enquiring about the use of analgesia and if analgesia had not been given, why not?. Data were entered onto a database and analysed using the Epi Info 6 package.

Results—A total of 83 children were recruited to the study. Fourteen (17%) had received paracetamol before presentation to A&E. No child received ibuprofen. There was no significant correlation between parental knowledge of the analgesic effects of paracetamol and pre-hospital administration (p=0.06, Fisher’s exact test). There was no significant correlation between pre-hospital administration of analgesics and the decision to give analgesia in A&E (p<0.53, Fisher’s exact test). Neither pre-hospital or A&E administration of analgesia significantly correlated with the decision to admit the child (p<0.31, p<0.51, Fisher’s exact test). The most common reasons for analgesia not being administered before presentation in A&E were: parents did not think paracetamol would help their child (23 cases); the child was not at home when the injury occurred (21 cases) or that there was no paracetamol at home (13 cases).

Conclusions—There are several factors predisposing to children not receiving analgesia pre-hospital after an injury. The commonest reasons for not giving paracetamol were that it was not available either because the child was not at home or it was not in stock at home. Interestingly although children did not receive paracetamol if it was the parental perception that paracetamol would be of no benefit to the child, knowledge of the potential benefits of paracetamol did not increase use. The decision to administer analgesia in A&E is not influenced by the pre-hospital administration. Presumably it is the child’s condition on arrival at the department that determines hospital analgesia administration. A further study is to be carried out to determine the relation between administration of analgesia pre-hospital and triage pain score on hospital administration of analgesia.

The impact of a dedicated district general hospital paediatric accident and emergency unit on the number of paediatric admissions to the hospital

M Melra, V M O’Neill, A Groves St Peter’s Hospital, Chertsey, Surrey

Aim—To evaluate resource implications of an outbreak of meningitis in a district general hospital open to both “walk in” patients and general practitioner referrals. The PAEU with its many advantages, including a greater presence of paediatric medical staff alongside accident and emergency department medical staff and paediatric accident and emergency trained nursing staff providing focused paediatric care in an optimally configured environment, serves to reduce the number of patients admitted to the paediatric wards.

Resource implications of an outbreak of meningitis to a district hospital accident and emergency department

O O Jibukwu, W D T Moody-Jones Eau Glanmorangie Hospital

Aim—To evaluate resource implications of meningitis outbreak to a district accident and emergency (A&E) department.

Methods—Data from Public Health Laboratory showed that meningococcal disease epidemics occurred over a three week period,
from 23 January 1999 to 16 February 1999. Using the department's computer system, we retrieved all attendances within this period and compared with similar periods for 1998 and 1997. All patients with features suggestive of meningococcal disease were included in the study and their A&E case notes were manually reviewed. All patients admitted direct to ward were excluded. The laboratory investigations, referral and admission rates of these patients were recorded.

Data and results—The results are shown in table 2.

Discussion—A fourfold increase (4) in number of cases of meningococcal disease during epidemic led to a 1.3-fold increase in new attendances (128) to the local A&E department, and a 3.2-fold increase (145) in attendance with features suggestive of meningitis, a 1.4-fold increase in drug treatments (6) and a 2.8-fold increase (23) in referrals for admission from emergency department, a twofold increase (25) in admissions rate and a fivefold increase (66).

Conclusion—For every case of meningococcal disease (meningitis or meningococcal septicaemia) diagnosed in the A&E department, 54 additional cases of non-meningococcal disease conditions are seen at the local A&E department. This translates to an additional 18–20 hours of a Senior House Officer time. The case is therefore made that for every two cases of meningococcal disease, the additional workload was equivalent to one week of doctor’s time.

Stage seven: install the system
Stage eight: training, training, training

Evaluation phase—As soon as the system starts to be used the evaluation process should also begin. A written contemporaneous record needs to be made of the consultation at both the remote and central site, and for the purposes of formal evaluation a sample record sheet is described. The essential information required in the evaluation process is as follows:

1. Date and time of call.
2. Patient identification.
3. What would have happened to the patient if telemedicine had not been available.
4. Name and grade of staff at both ends of each teleconsultation.
5. Nature of the problem requiring teleconsultation.
6. Patient outcome.
7. Time required for call.
8. Notes and comments.

Optional information includes whether the patient was present during the consultation, whether a radiograph was transmitted and satisfaction scores for patients and staff.

The reckoning—For any new healthcare development auditing and formal review are mandatory. Techniques for clinical and economic evaluation are described, along with the experiences of several A&E departments in which minor injuries telemedicine has recently been adopted and this evaluation template used.

Respiratory rate measurement at the double

P Burdett-Smith, A Breakell, C Townsend-Rose, A Fisher
Royal Liverpool University Hospital

The respiratory rate is a useful clinical indicator of disease. It is affected by a range of conditions from those directly affecting the respiratory tract, to metabolic disturbance, cerebral pathology and trauma. It is one of the parameters in a number of scoring scales, including the revised Trauma Score and APACHE II and is a prognostic sign in the WHO classification of acute respiratory disease. Yet it is commonly omitted during initial assessment and is poorly recorded even when shown to be clinically necessary. It is the only one of the vital signs that cannot yet be easily recorded electronically.

Two groups working independently in the accident and emergency (A&E) department of the Royal Liverpool University Hospital have developed electronic devices to measure respiratory rate in conscious spontaneously breathing patients.

The Royal Liverpool University Hospital has a piloted device which uses a thin film of gas, a pressure sensor and a microcomputer to calculate the respiratory rate. This has been used in the accident and emergency department to improve the treatment of patients with respiratory problems.

A prototype was evaluated in the laboratory and the clinical department. The speed, accuracy, and reliability of the device were found to be satisfactory. The device is now being used in the accident and emergency department of the Royal Liverpool University Hospital to assist in the management of patients with respiratory problems.

Evaluation of an ambulance—emergency department telemedicine link: the Blackpool experience

C Brookes, N Harrop, A Mitchell*
Blackpool Victoria Hospital and *Lancashire Ambulance Service

Telemedicine is becoming increasingly accepted as a valuable adjunct to patient assessment. Within Lancashire, a joint project has been developed between the ambulance service and the accident and emergency department at the Victoria Hospital, Blackpool. This involves generating television output from colour video cameras and transmitted over a GSM telephone network. The pictures are transmitted to a personal computer and used to improve the assessment of the patient. The system is now being used in the accident and emergency department of the Victoria Hospital, Blackpool.
A study of minor injuries care in accident and emergency department versus minor injuries unit

M Sakr, J Angus, A Saunders, J Wardrobe

Aims—To investigate the processes of care and treatment provided to patients with minor injuries presenting to accident and emergency department (A&E) and compare it with similar group of patients presenting to the same hospital after relocation of the department to a nurse led minor injuries unit (MIU).

Patients—1500 adult patients presenting with minor injuries to A&E department, compared with similar 1355 patients presenting to the MIU that replaced the department.


Design—A prospective study with double assessment of the patient (clinical and research). These two assessments were compared. On completion of the study the groups were compared.

Results—These are the results from analyses of 1440 patients from A&E department, and 1315 from MIU. The remaining will be available soon. When compared against an experienced A&E clinician, there were statistically significant differences in the accuracy of medical history taking in favour of nurse practitioners working in the MIU. Waiting and department times were also significantly shorter (p<0.0001). On the other hand there was a statistically significant difference in the accuracy of examination in favour of doctors working in the A&E department. Nurses also tended to arrange more follow up than doctors (p<0.05).

Conclusions—The establishment of nurse practitioner led MIU has provided fast track for patients presenting with minor injuries. The quality of clinical care was as good as that provided by doctors.

Pre-registration house officers in accident and emergency medicine—a step forward to a career

M R James, J Whittaker

Royal Preston Hospital, Lancashire

Pre-registration house officer posts in accident and emergency (A&E) medicine were discontinued 20 years ago. There is evidence of the fact that many pre-registration house officers were becoming dissatisfied with the learning experience during that year of their training. We felt that A&E medicine could offer an improved experience for them. After discussion with our local postgraduate dean, she agreed to fund a pilot project for a year. The first pre-registration house officers took up post in August 1997. This project has generated an enormous amount of interest from around the country and we are aware of several other similar schemes currently being set up. We therefore feel that this innovation urgently requires accurate dissemination at a national meeting both to ensure that schemes are set up appropriately and also to stimulate discussion.

An emergency admissions unit— a threat or an opportunity

G G Ferguson

Central Sheffield University Hospitals Trust

In May 1997, the accident and emergency (A&E) services left the Central Sheffield University Hospitals Trust and moved to the Northern General Hospital Trust, Sheffield. The emergency workload at the CSUH dropped from 60% of the city's activity to 30%.

We built a unique emergency admissions unit capable of treating all emergencies other than trauma, there is a dedicated nursing staff but the medical and surgical teams are the on call teams of the day and they have sole responsibility for the patients. Our patients are secondary referrals from general practice, our intention was to make it as easy as possible for general practitioners to admit patients into hospital or to receive an emergency opinion, this is organised through our Bed Bureau. The 30 bed unit is where the most acutely ill, medical and surgical patients are treated until stabilised and then they are transferred to available beds within the hospital, the majority being transferred within a 24 hour period.

We want to extend our direct admission protocols from the current back pain, and shortly to be developed gynaecological bleed protocol, to capture patients with respiratory and gastrointestinal bleed problems.

1 Who should manage such a unit? Is it the practice of the A&E consultant?
2 Is there a training opportunity for SpRs in A&E medicine?
3 Are such units a threat to local A&E department, as they may cherry pick selected emergencies?
4 Do hospitals perish when they lose their A&E departments?


Feasibility study of rapid diagnosis and treatment centres

R D Hardern, A Taylor, R Shelton, A Lester
The General Infirmary at Leeds

Objective—To estimate the impact of opening a rapid diagnosis and treatment centre (RDTC)

Design—Retrospective review of accident and emergency (A&E) cards.

Setting—Urban A&E department with 100 000 new patients annually.

Subjects—A&E cards were reviewed for all adults presenting over 16 consecutive days.

Interventions—Clinical records were compared with predetermined RDTC management policies that were developed for 28 conditions. Average length of stay (both mean and median) for specific conditions were determined from the hospital Patient Administration System. Anticipated length of stays were calculated for each RDTC protocol and estimated made of the proportion of patients who would be discharged from hospital at the end of each protocol (based on published research where available).

Main outcome measures—For each condition with an RDTC protocol the anticipated bed occupancy if the RDTC had been operational was calculated. This was compared with the bed occupancy based on historical data (with no RDTC). The difference between these was calculated.

Results—During a 16 day period there were 4165 attenders. Of these 225 (5.4%) were felt to fit the entry criteria for RDTC management. The size of RDTC that would be required to accommodate patients promptly was 10 beds, though expected bed occupancy on RDTC was six to eight at most times. The average number of ward beds that would be freed by the RDTC was estimated to be 16–30 (dependent on whether mean or median was used as “average”). If an RDTC had been operational during the period of the study the average overall daily bed saving would have been between 6 and 20 beds. The greatest expected bed savings were from patients presenting with deliberate self harm, exacerbations of COPD, chest pain (with low risk of acute coronary syndrome) and community acquired pneumonia.

Conclusions—Managing patients with a limited number of (high volume) conditions whom fit strict entry criteria for a limited time (24 hours maximum, though less for many conditions) expected to reduce bed occupancy without increasing clinical risk.

Admission avoidance and early discharge of acute hospital admissions: an accident and emergency based scheme

C Hardy, D Whitwell, B Sarsfield, C Maimaris
Department of Accident and Emergency Medicine, Liferamp Community NHS Trust Addenbrooke’s Hospital, Cambridge

Objective—To determine whether peer review of consecutive patients with chest pain can improve patient care pathway in exclusion of an acute myocardial infarction and significant ischaemia in patients presenting to the accident and emergency (A&E) department with chest pain.

Methods—This was a prospective study of consecutive patients with chest pain of possible cardiac origin presenting to an urban teaching hospital A&E department. Their assessment was as part of the chest pain care pathway including repeated ECGs and a troponin T level at 12 hours after the onset of chest pain. All patients discharged from the A&E department without review by the medical on call team were followed up for 30 days.

Results—In the three month study period 206 patients presenting with chest pain were discharged from the A&E department. The average length of stay was 1.2 days compared with the 6.3 days before the project. The remaining 121 patients were not directly comparable but were discharged in <48 hours. Four patients re-attended at A&E but again were suitable for early discharge.

Conclusions—As part of a chest pain care pathway, troponin T measured at 12 hours after the onset of pain is a useful tool in excluding AMI and significant ischaemia safely allowing shorter hospital admissions than in previous practice.

Peer review: demonstrating quality in accident and emergency

J Porter, S Nash*, M Shelley†
BAEM, †Bromley Hospital and †Birmingham Heartlands Hospital

Ann of study—To determine whether peer review would be of value in accident and emergency (A&E) medicine in terms of:

• providing support to colleagues
• spreading good practice
• contributing to requirements for audit and clinical governance
• contributing to the continuing professional development of those taking part.

Method—All A&E consultants in North East Thames and the West Midlands were invited to take part and over 80% volunteered. They were randomly selected to act as visitors or to receive a peer review of their department. All visitors were from the opposite region but were allocated as closely as possible to hospital comparable to their own. Visitors were asked to approach the visits as an appraisal not an assessment but clear documentation was provided to maximise consistency and minimise the workload of report preparation.

There were four components to the review:

Table 3 Process of care and radiological clinically important errors

<table>
<thead>
<tr>
<th>Error</th>
<th>A&amp;E (n, %)</th>
<th>MIU (n, %)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>History, mechanism of injury</td>
<td>2 (0.1)</td>
<td>1 (0.07)</td>
<td>p=1</td>
</tr>
<tr>
<td>Past, medical history</td>
<td>32 (2.2)</td>
<td>5 (0.4)</td>
<td>17.6</td>
</tr>
<tr>
<td>Examination</td>
<td>28 (1.9)</td>
<td>43 (3.3)</td>
<td>4.81</td>
</tr>
<tr>
<td>Treatment, advice</td>
<td>60 (4.2)</td>
<td>42 (3.2)</td>
<td>1.8</td>
</tr>
<tr>
<td>Follow up</td>
<td>48 (3.3)</td>
<td>42 (3.2)</td>
<td>0.03</td>
</tr>
<tr>
<td>Total number of patients analysed</td>
<td>1440</td>
<td>1315</td>
<td></td>
</tr>
<tr>
<td>Radiographs requested</td>
<td>240 (16.7)</td>
<td>197 (14.9)</td>
<td>1.46</td>
</tr>
<tr>
<td>Radiological interpretation</td>
<td>13 (0.9)</td>
<td>10 (0.8)</td>
<td>0.12</td>
</tr>
<tr>
<td>Resumes</td>
<td>157 (8.1)</td>
<td>228 (17.3)</td>
<td>23.7</td>
</tr>
</tbody>
</table>

permanent basis and extension of this strategy to other patient groups is under evaluation.

Troponin T: the answer to chest pain in accident and emergency?

E Worthington, J Hollingsworth, L Jaffey, S Salissi, P Mullins, E Manning, A Stott
Department of Accident and Emergency, Cardiology and Clinical Biochemistry, Royal Liverpool University Hospital

Objective—The introduction of troponin T as the primary biochemical marker of myocardial damage: its negative predictive value as part of a chest pain care pathway in exclusion of an acute myocardial infarction and significant ischaemia in patients presenting to the accident and emergency (A&E) department with chest pain.

Method—This was a prospective study of consecutive patients with chest pain of possible cardiac origin presenting to an urban teaching hospital A&E department. Their assessment was as part of the chest pain care pathway including repeated ECGs and a troponin T level at 12 hours after the onset of chest pain. All patients discharged from the A&E department without review by the medical on call team were followed up for 30 days.

Main outcome measures—Length of hospital stay, all cause mortality, diagnosis of AMI, admission to hospital, further attendance at an A&E department with complaint of chest pain or other cardiac symptom.

Results—In the three month study period 206 patients presenting with chest pain were discharged from the A&E department. The average length of stay was 1.2 days compared with the 6.3 days before the project. The remaining 121 patients were not directly comparable but were discharged in <48 hours. Four patients re-attended at A&E but again were suitable for early discharge.

Conclusions—As part of a chest pain care pathway, troponin T measured at 12 hours after the onset of pain is a useful tool in excluding AMI and significant ischaemia safely allowing shorter hospital admissions than in previous practice.
collection of data on the workload and resources of the department

- a record of departmental performance against quantitative standards
- an appraisal by the visitors of the quality of departmental care across a range of areas, as they perceived it by observation and discussion with staff
- an appraisal of the department by other hospital departments and outside agencies by questionnaire.

All those involved were asked to evaluate the process and will be asked a year later whether any change resulted.

Results—12 visits completed by January 2000 form the basis of this presentation. Results highlight the need for improvement in A&E workload and resources and the difficulty in obtaining reliable data, particularly for clinical audit. The process seemed to be of greatest value to the visitors but evaluation from all those involved was overwhelmingly positive.

Participants have been able to suggest a range of improvements to details of the scheme but the framework seems sound and we believe it would be replicable as a nationwide programme to demonstrate the specialties commitment to quality care.

Does risk stratification apply to British accident and emergency patients presenting with acute syncope?

S Cran
Yorkshire Rotation
Background and Aims—Syncope is defined as a sudden, temporary loss of consciousness from which the patient makes a complete and spontaneous recovery. Following a review of the literature (which consistently points to heart disease as being the major prognostic factor in patients with syncope), the American College of Physicians (ACP), published a position paper that includes disposal guidelines for syncope patients. The guideline divides syncope patients, (based on easily obtainable data such as age, history of presenting complaint, examination, past medical history and ECG changes), into those who should be admitted, those in whom admission is often indicated and the remainder. We have called these high, moderate and low risk groups respectively. The aim of this study was to find out if this risk stratification is applicable to British practice.

Methods—Study data were collected in the accident and emergency (A&E) department of the Leeds General Infirmary (LGI) over an eight week period beginning on 2 November 1998. All A&E records were hand searched by the same reviewer to identify those with a pre-existing diagnosis of syncope. The study included all patients who presented with a limp undergoing clinical assessment. Subarachnoid haemorrhage is one condition in which initial misdiagnosis may lead to avoidance of morbidity and mortality, particularly in patients in whom headache is the only presenting symptom. A decision support tool for patients with headache may therefore be of practical use to the inexperienced clinician. One such method is Bayesian graphical modelling; existing knowledge is made explicit as an expression of “prior belief”, which is then modified by the addition of new patient information.

Aim—To demonstrate the theoretical applicability of rawdata Bayesian graphical modelling to the problem of patients attending the accident and emergency department with headache.

Method—Expert opinion and structured searches of the medical literature were undertaken to construct a visual representation of the diagnostic process and to select relevant aetiological factors, symptoms, signs and differential diagnoses. Each factor becomes a node within the model, with unidirectional links denoting the existence of a relation between nodes. Every relation is assigned a conditional probability, derived where possible from the literature. Where structured searching techniques fail to identify relevant literature, expert opinion or a “best guess” is used to assign these probabilities. Prospective data collection must be standardised to generate information in a form that can be entered into the graphical model.

Conclusions—The potential benefits and difficulties of this approach are discussed.

Table 4

<table>
<thead>
<tr>
<th>Risk as per ACP Guidelines (traceable patients only)</th>
<th>Number dead at one year (n=24)</th>
<th>Incidence of death within one year (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High (n=64)</td>
<td>Admitted (n=29)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Discharged (n=35)</td>
<td>27</td>
</tr>
<tr>
<td>Moderate (n=57)</td>
<td>Admitted (n=31)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Discharged (n=26)</td>
<td>3</td>
</tr>
<tr>
<td>Low (n=88)</td>
<td>Admitted (n=10)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Discharged (n=78)</td>
<td>0</td>
</tr>
</tbody>
</table>

differential exactly one year later to determine whether the patient was still alive. The Chairman of the LGI Research Ethics Committee approved the study.

Results and Comment—The total number of patients included in the study was 210 (1.75% of all adult A&E attenders). There was a bimodal distribution in terms of age with 41% younger than 44 years, 14% aged between 45 and 65 years and 45% older than 65 years. Sixty two per cent were women. Forty seven (22%) of patients were stratified into the high risk group, 63 patients (30%) into the moderate risk group and 100 patients (48%) into the low risk group as defined by ACP Guidelines. A total of 189 patients could be traced at a year of whom 24 (12.7%) had died. Other results are shown in table 4.

Forty two per cent of the entire sample were not assigned a diagnosis after their assessment in the A&E department. This study has shown, however, that syncope patients can be stratified in terms of risk and that this accurately reflects subsequent prognosis. As it is known that syncope patients with heart disease are at greater risk, better decisions regarding subsequent disposal, follow up and treatment of these patients may be made. It remains unclear from this study, however, if admission to the hospital improves outcome.


Headaches in the accident and emergency department: towards a decision support system using Bayesian graphical modelling

K Lambert, N Halford, M Rickards, R Thomson*, F Coolen†, D Woolf†
Queen Elizabeth Hospital, Gateshead, *Newcastle University and †Department of Mathematical Sciences, University of Durham

Introduction—Decision support systems are becoming increasingly used in medical practice. Subarachnoid haemorrhage is one condition in which initial misdiagnosis may lead to avoidable morbidity and mortality, particularly in patients in whom headache is the only presenting symptom. A decision support tool for patients with headache may therefore be of practical use to the inexperienced clinician. One such method is Bayesian graphical modelling; existing knowledge is made explicit as an expression of “prior belief”, which is then modified by the addition of new patient information.

Aim—To demonstrate the theoretical applicability of Bayesian graphical modelling to the problem of patients attending the accident and emergency department with headache.

Method—Expert opinion and structured searches of the medical literature were undertaken to construct a visual representation of the diagnostic process and to select relevant aetiological factors, symptoms, signs and
siderations. The current practice within our A&E department is to utilize a short stay ward for such patients, excluding those with skull fractures or positive CT scans. Consequently a study was undertaken to assess the impact of implementation of the Galasko report on our department’s workload.

Methods—A retrospective analysis was undertaken of all patient case notes of patients with head injury over a one year period. Admission criteria to the A&E ward consisted on the presence of one of the following:

1. Confusion or any depression of the level of consciousness at the time of examination.
2. Neurological signs and/or severe headache and vomiting.
3. Difficulty in assessing the patient, for example, alcohol, epilepsy.
4. Other medical conditions, for example, haemophilia, patients on warfarin.
5. The patient’s social conditions or lack of a responsible adult/relative.

Patients with skull fractures or under 16 years of age were admitted under the general surgeons, while patients with positive CT findings were discussed with the regional neurosurgeons, while patients with positive CT scans. Consequently patients deteriorated after admission necessitating a CT scan, although none required neurological transfer. Twenty three patients required transfer to other wards because of protracted social reasons (2.6%), persistent head injury symptoms (2.6%) or for other specialist treatment (3%). There were no deaths or adverse sequelae.

Discussion—Although the management of head injuries within our A&E is safe, the presence of 24 hour on site middle grade cover is hospital admission until a Doppler test can be performed. Patients with a high clinical suspicion of venous thrombosis and a fully staffed ward nearby, is not feasible in most A&E departments. Furthermore, this study reveals that our own short stay ward is frequently unavailable, and that patients often require care beyond 48 hours, necessitating admission under the care of the general surgeons (not including those admissions for skull fractures or post-neurosurgical rehabilitation). Our experience suggests that the nationwide implementation of the Galasko report is unattainable unless additional resources are available, and clear guidelines developed.

An evaluation of emergency department lower limb plethysmography in the diagnosis of venous thrombosis

J Ryan, S Barden, B Tidey

Royal Sussex County Hospital, Brighton

Aims—The aim of the study was to evaluate the impact of introducing lower limb plethysmography for the diagnosis of deep vein thrombosis (DVT) in the emergency department.

Methods—A plethysmographic venometer was used in the emergency department to assess patients with a clinically suspicious DVT. The investigation was available 24 hours a day and performed by radiographers. Any patient with a clinical suspicion of a DVT had an initial diagnostic test performed using the venometer. Patients with negative venometry were discharged. Any patient with positive venometry underwent Doppler studies for further evaluation and were treated appropriately.

The emergency department computer system was searched for three months after their test for unscheduled return visits by those patients who had had a “normal” venometer result.

Results—737 venometer studies were performed on emergency department patients during a 14 month study period. Full data were available in 684 cases. A positive result was obtained in 205 (33%) cases and a negative result in 479 (67%) cases. There were 76 false positive tests, defined as those cases where a venometer gave a positive result but Doppler ultrasound investigation was normal. Of the 479 patients with normal venometry no patient returned with symptoms or signs of thrombotic disease within three months of the initial presentation. Thirty nine patients with an initial negative venometry had further diagnostic tests performed that showed a positive Doppler in three cases and a high probability V-Q scan in two cases.

Conclusions—The venometer is a non-invasive tool that can provide a rapid and safe result in the emergency department for most patients where a diagnosis of lower limb thrombotic disease is suspected. Its use has significant cost saving implications particularly where the patient presents out of hours as the alternative is hospital admission until a Doppler test can be performed. Patients with a high clinical suspicion of venous thrombosis and an initial negative venometer should have a repeat venometer performed at a later stage.