Annual Conference for the British Association for Accident and Emergency Medicine, Birmingham, 29 April to 1 May 1998

Table 1  Mechanisms of injury and how these injuries were described. Values are number of patients

<table>
<thead>
<tr>
<th>Mechanism of injury</th>
<th>Blunt</th>
<th>Sharp</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of wound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incised</td>
<td>2</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Laceration</td>
<td>144</td>
<td>67</td>
<td>211</td>
</tr>
<tr>
<td>Total</td>
<td>146</td>
<td>85</td>
<td>231</td>
</tr>
</tbody>
</table>

ABSTRACTS

Acute myocardial infarction and left bundle-branch block: application of an electrocardiographic method to determine eligibility for thrombolysis

J A Edhouse, MSale, J Angus, N M Wheelon, F P F Morris

Introduction-Description

From the emergency department all patients presenting with an injury were included. The electrocardiographic (ECG) changes of acute myocardial infarction are difficult to recognise in the presence of left bundle-branch block (LBBB), which may lead to inaccuracy and thrombolysis. Patients with acute myocardial infarction and LBBB have a poor prognosis and early reperfusion is particularly beneficial. However, inappropriate thrombolysis must be avoided. ECG criteria have been described to help identify which of these patients are infarcting.

All patients presenting with LBBB and chest pain suggestive of infarction were studied over an 18 month period. The final diagnosis was based on serial cardiac enzyme estimations. Blinded to the final diagnosis, the likelihood of acute myocardial infarction was predicted from the initial ECG using the predictive criteria.

Fifty two per cent (15/29) of those thrombolysed did not have a demonstrable myocardial infarction. Of the group who had a myocardial infarction, 22% (5/23) had thrombolysis withheld unnecessarily, while those who received thrombolysis had an average door-to-needle time of 158 minutes. Applying the predictive ECG criteria, 100% of patients with a myocardial infarction and LBBB were identified (21/21). Furthermore, the proportion of patients having thrombolysis withheld inappropriately would be reduced (9% ± 22%).

The use of simple ECG criteria could enable myocardial infarction in the presence of LBBB to be recognised rapidly, and thrombolysis instigated without delay.

Laceration or incision—what's in a name?

H Draper, J Munns

Introduction—Description of wounds is said to be poor, despite the fact that the distinction between laceration and incised wound has medicolegal implications. In this study we assessed the accuracy with which medical staff use the terms “laceration” and “incision” to document injuries in the accident and emergency (A&E) department.

Patients and methods—This study was carried out in the A&E department of a London teaching hospital. We reviewed the records of all patients who presented during one month. From the 231 records included, we determined whether the mechanism of injury was blunt or caused by a sharp instrument and noted the corresponding description of the wound.

Results (table 1)—Overall 70% of the wounds were appropriately described. Whereas 99% of blunt injuries were correctly described as lacerations, only 21% of injuries with sharp instruments were correctly described as incised wounds.

Comment—The term “laceration” is common usage in the A&E department to describe any injury involving a breach of skin. This can lead to confusion in medicolegal reports and policy statements, for example in cases of assault, when the correct description of a wound is of vital importance as it can significantly influence whether a conviction is made and the severity of the sentence imposed.

Six months in Australia—a descriptive study of the role of the registrar and senior house officer in an Australian emergency department

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Introduction—There is considerable debate regarding the appropriate development of the specialty of accident and emergency (A&E) medicine in the UK. There have been suggestions that we should adopt some of the practices and structures used in Australasia and North America.

A previous study has described the role of the A&E registrar in Scotland. This study enables comparison with an equivalent post in an Australian teaching hospital and compares the role of registrar with that of the senior house officer (SHO).

Methods—Data including demographics, presenting complaint, triage category, final diagnosis, and disposal were collected for every patient seen by a registrar and a SHO for a six month period. Additional data relating to hours worked and shift patterns were also collected.

Results—Workload and casemix data will be presented showing significant differences in the activity of both the SHO and registrar post compared with their UK counterparts.

Conclusions—The workload and casemix of patients seen in Australia is significantly different from that seen in the UK and recom mendations based upon Australian practice must take account of this.

How to get kicked out of accident and emergency

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Physical violence arising from members of the public in accident and emergency (A&E) departments is a problem that has become more prominent in recent years. Increasingly A&E departments are deploying strategies to achieve better control of such violent behaviour in order to limit injuries to staff and damage to property. A case study of a recalcitrant offender is presented to illustrate the range of techniques that may be employed to attempt to bring about reasonable control while at the same time maintaining staff and patients in need of treatment. The existing literature has been reviewed to provide a comprehensive catalogue of techniques. Additional methods that may be employed in extreme cases are also described. These involve hitherto little used areas of the criminal and civil law and a new criminal offence recently created (through the Protection from Harassment Act 1997), which in the view of the authors are likely to be of considerable use in the future in the face of ever increasing incidence of assault on A&E personnel.

Triage in the park—the Glasgowcrowd triage system

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Objectives—We devised a triage flow chart for use by first aiders at major crowd events. The aims were to establish if first aiders could use it effectively in comparison with trained medical staff and also to assess its efficacy in comparison with established triage systems.

Methods—The triage flow chart was used by first aiders acting as triage staff at a major music festival with an attendance of 100 000 people. The on-site medical researcher also placed every patient in a “check” triage category using the same chart. The Manchester triage flow charts were used to provide a standard of reference and a physiological scoring system was used in those patients with available data as a further comparison.

Results—There were 421 patients seen in the hospital tens of over two days and 403 patients records were available for the study. Use of the triage flow chart by the first aiders in comparison with a member of trained medical staff had a sensitivity of 97.5% and a specificity of 94.25%. Use of the triage flow chart in comparison with the Manchester system had a sensitivity of 99.0% and a...
specification of 85.5% when used by first aiders. The sensitivity was 99.75% and specificity 89%. The number of true positive cases was used to calculate the percentage of triage error in these circumstances to ensure the most efficient management of patients.

Early warning of accident and emergency departments by ambulance service

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Late warning of the accident and emergency (A&E) department, of the imminent arrival of patients at critical cases by the ambulance service allows A&E departments to prepare. Depending on the hospital this may involve calling staff from other parts of the hospital (for example, cardiac arrest team, trauma team, paediatrician) or calling staff from home. Adequate warning is therefore vital.

Aims—To determine the length of warning given by the ambulance service, the accuracy of this time estimate, and whether this could be increased.

Methods—The ambulance control room records of a large metropolitan ambulance service were analysed for seven complete days, for all cases resulting in an “alert” of the hospital by the ambulance service. The potential improvement was extrapolated by calculating the improvement if the alert call had occurred within 5 minutes of arrival of the first responder on scene. A separate group of four weeks trauma alerts were analysed.

Results—104 cases were analysed. The ambulance service estimated their time of arrival at hospital correctly (inaccuracy of 0 minutes, SD 2.7); the average alert warning time being 7 minutes (SD 1.4). In most circumstances the alert was made 1 minute (SD 3.9) after leaving hospital and average time on scene being 22 minutes (SD 11.2). If it had been made within 5 minutes of arrival of the first responder on scene the A&E department would have been alerted 18 minutes (SD 13.6) earlier. For a group of 34 trauma cases, the average alert time was 7 minutes (SD 4.0), the average on scene time was 23 minutes (SD 13.4) with a potential to alert the hospital 25 minutes (SD 18.6) earlier.

Conclusions—Ambulance crews make an accurate assessment of their arrival time at hospital but could give the hospital significantly more time to prepare. An early warning time has significant implications for planning and resources in the A&E department. Further work is being undertaken on trauma cases.

Rollerblade injuries and their prevention

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Aims—To ascertain the pattern of rollerblade injuries in a general accident and emergency (A&E) department and to relate it to the possession and use of protective equipment.

Methods—We studied patients of all ages identified as having an injury sustained while rollerblading who attended our A&E department during a four month period in 1997. Data collected included clinical, disposal, and follow-up details and information on protective gear worn at the time of injury and protective gear owned.

Results—Full data were available on 97 patients who sustained 123 injuries. The mean age was 11.2 years (range 3 to 36 years) and 84% were male. The commonest site of injury was the wrist (44 injuries) of which 25 were fractures. None of these patients was wearing a wrist brace. Injuries at other sites were predominantly soft tissue. Seventy three of the injuries occurred in sites protected by currently available safety gear. Of the 97 patients in our study, 82 wore no protective gear. Two patients wore all four types of safety equipment, six wore three types, and seven wore one type. Twenty eight patients owned all types, 36 owned some, and 33 patients owned no safety equipment.

Discussion—Rollerblade injuries are an increasingly common cause of A&E attendance in the UK. Many rollerbladers do not possess protective gear. The majority of those who do, actually use it. It has already been shown that properly worn safety equipment confers protection against injury: wrist braces reduce the risk of wrist injury tenfold. We recommend that all rollerblade injuries, with the possible exception of head protection be mandatory with the sale of rollerblades. The presentation will describe the process by which observations such as these can lead to legislative change in the area of injury prevention.

Safety standards for stab resistant body armour: a computed tomography assessment of organ to skin distances

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The continuing rise in the number of serious assaults on police officers has led to an urgent need to issue body armour to protect them from both knife attacks and shootings. The risk of knife attack is far greater than that of shooting. The protective properties of knife resistant armour are quantified by the distance a test blade penetrates through a test sample at a given energy. At present there are two proposed standards: penetration to 5 mm and penetration to 20 mm. Armour made to the higher standard specification (5 mm) is necessary heavier as it offers more protection.

To determine the safety of these standards a retrospective review of 71 consecutive computed tomograms was made. The minimum distance from the skin to the vital organs was measured.

No organ would have been breached at 5 mm of knife penetration deep to body armour. Forty one per cent of pleura, 61% of livers, 68% of the spleen, and 6% of hearts would have been breached at a depth of 20 mm of knife penetration. There was no significant difference in the minimum skin or organ distances between male and female surgeons.

We conclude that the 20 mm standard does not offer adequate protection to knife attacks.

Hypoglycaemia—do we need another protocol on the wall?

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Aims—To assess the working knowledge of doctors attending paediatric emergencies with respect to the investigation of hypoglycaemia and to consider the use of an informative wall chart to aid management.

Methods—Fifty randomly chosen doctors were asked to deal with paediatric emergencies participated in a telephone survey. They were questioned about their paediatric and endocrine experience and were then asked specifically what tests they would look for if they were in a situation where much blood was required, and how it should be collected. They were then asked where they would find information they did not know and whether or not they thought a chart defining the correct actions could be displayed in their emergency department.

Results—Twelve paediatric senior house officers, 18 paediatric specialist registrars, 10 staff grades/research fellows and 10 accident and emergency (A&E) staff were interviewed. Seven had past endocrine experience. Overall, recall of the definition of hypoglycaemia, relevant investigations, and the practicalities of the phenomenon as a diagnostic process was poor. Those with endocrine experience were more likely to answer correctly and those primarily trained in A&E less likely. Only 12 (24%) were aware of the existence of a hospital protocol and 45 (80%) did not consider hypoglycaemia serious or requiring outlining specimen collection for the relevant tests would be useful.

Conclusions—Hypoglycaemia in infancy is an uncommon condition. It is important to perform certain investigations at the time of hypoglycaemia to diagnose potentially life threatening metabolic disorders. Doctors treating paediatric emergencies need to know how to investigate hypoglycaemia and a simple wall chart would be the quickest reminder and more reliable than the memory of medical staff.

British Thoracic Society guidelines for spontaneous pneumothorax: do they work?

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Objective—To assess the validity of the British Thoracic Society guidelines in the management of spontaneous pneumothorax.

Methods—A retrospective case note study of all spontaneous pneumothoraces attending the accident and emergency department of a large district general hospital.

Results—115 episodes of spontaneous pneumothorax were identified. Patients without chronic lung disease could be safely observed as outpatients. Forty three pneumothoraces were aspirated: 23 (58%) successfully; eight (19%) with little or no improvement; and 12 (27.9%) initially successfully but developing increased size of pneumothorax within a period of 72 hours. Three patients had repeat aspirations, two successfully. Age over 50, moderate chronic lung disease, and more than 2.5 litres of air aspirated were significantly associated with failure of aspiration (p<0.01). There was a 28.6% failure rate of aspiration for patients with moderate pneumothoraces without chronic lung disease.

Conclusions—Patients over the age of 50 should be treated the same as patients with chronic lung disease. Aspiration should be attempted if the first aspiration is initially successful. Further research is required to clarify if patients with moderate...
Abstracts

Minidrain as an alternative to aspiration in spontaneous pneumothorax
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Originally described in 1981 simple aspiration was adopted by the 1993 British Thoracic Society for their guidelines on the management of spontaneous pneumothorax. The recommended technique is to insert a cannula into the pleural cavity and connect this to a 50 ml syringe and a three way tap. Air is then aspirated into the syringe and expelled via the open port of the three way tap. This technique is advised for pneumothoraces of up to 2.5 litres. One study showed an average volume of 1.8 litres in a spontaneous pneumothorax requiring aspiration, equivalent to 36 fillings of the 50 ml syringe. Each movement of the syringe is liable to move the cannula, which may result in failure to aspirate air or pain.

A technique is described with an illustrative case history that allows quicker and more comfortable resolution of the pneumothorax. A 14 gauge cannula is introduced into the pleural space and a further 50 ml of air aspirated via the cannula to the tubing. The free end was immersed in a container of sterile water. The tap was then adjusted to open the cannula to the tubing. The patient was then asked to cough. With each cough a large amount of air bubbled out of the system. On the ninth cough, no more air bubbled. A syringe was then connected to the tubing and a further 50 ml of air aspirated in the standard way. A chest radiograph then revealed complete resolution of the pneumothorax. Outpatient follow up was arranged. The only pain suffered was during the final cough and at the end of aspiration. The whole procedure was completed in five minutes.

We believe this is a safe simple technique that is quicker and causes less pain than traditional aspiration of a spontaneous pneumothorax.

Epistaxis—how to prevent readmission with rebleeding
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A survey was conducted in a district general hospital over a three month period. A total of 102 patients with epistaxis were identified of which 80 were treated and discharged from the accident and emergency (A&E) department; this was the group that was followed up. Information was collated from the A&E records and via a telephone and/or postal questionnaire to determine: (1) whether there were any further episodes of epistaxis, time to first bleed, and risk factors for epistaxis where identifiable and (2) what epistaxis advice given was recalled by the patient.

We conclude that one third of all patients rebleed and that uncontrolled hypertensive patients are at particularly high risk. The time pattern of rebleeding is presented. Recommendations are made concerning the timing of specialist follow up needed to prevent patients returning to the A&E department. Two thirds of the patients were given no advice at all or incorrect advice and this led to the development of a user friendly epistaxis advice sheet for patients.

The rising demand for emergency care: are children’s services affected?
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Sheffield Children’s Hospital NHS Trust, Western Bank, Sheffield S10 2TH and *Medical Care Research Unit, University of Sheffield

The rise in emergency admissions in recent years has strained health care providers and has puzzled policy makers and academics. However, to date, there has been no published evidence to suggest that the rise in adult emergency admissions has been accompanied by a similar rise for children.

Emergency and elective admission data for all Sheffield residents under the age of 16 years (approximately 1% of national total) were analysed for the 10 year period 1987/88 to 1996/97. Total emergency admissions fell over the decade by an average of 0.7% per annum. The average length of stay of emergency admissions also fell from approximately 3.5 to 2.0 days, leading to an overall fall in total occupation days.

There was little seasonal variation in emergency admissions, except for two quarters when they rose to approximately 30% above average. These increases were associated with outbreaks of bronchiolitis. Neither peak was associated with a reciprocal fall in elective admissions.

The rise in adult emergency admissions has not been replicated in children. Both emergency admissions and lengths of stay have fallen, suggesting that factors accounting for the rise in adults do not necessarily apply to children. Any future difficulties in paediatric bed management are more likely to be due to increasing elective admissions and decreasing bed numbers rather than to any increase in emergency admissions.

School accidents to children: time to act
A Maitra
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Aims—To describe the profile of injuries sustained by children in school accidents and suggest preventive measures.

Methods—A five month prospective study of children attending the accident and emergency department of the Royal Victoria Infirmary in Newcastle, UK was undertaken. This period allowed reaching the target of 500 children. Using a proforma, the initial information was collected by the triage nurse from the children, parents, and accompanying persons as appropriate. Subsequent details were filled in by the doctors.

Results—10 and 12 year old children suffered most injuries. Boys (59%) outnumbered girls (41%). Among the 10–11 year olds more girls (12.2%) than boys (10%) were injured. The injuries occurred in school grounds/ playgrounds, on concrete or grass/surfaced areas due to random activities resulting in striking or being struck by objects/persons, tripping or slipping, and sports (mainly football); 65.6% of these activities were not supervised and 67.4% occurred “out of lessons” 22% sustained fractures or dislocations, 28.2% needed follow up treatment, and 1.4% were admitted.

Conclusions—Injuries to children in school are a cause for concern. The present study reidentified the main target areas: (a) vulnerable age group and sex, (b) school environment, which is, specific areas of school and nature of surface, and (c) the need for supervision of specific activities. Effective preventive measures should concentrate on (a) these target areas using schemes based on individual schools, for example, setting up “lunchtime clubs” (chess, sewing, etc), playing innovative games, and (b) establishing a credible system of monitoring their effectiveness.

Emergency intubation of infants: does laryngoscope blade design make any difference?
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Emergency intubation of infants is fortunately rare in accident and emergency (A&E) practice but when required may need to be attempted by relatively inexperienced staff.

The straight infant laryngoscope blade is essential for the modified technique needed in infants but there are many different blade designs available. A&E departments have a choice of infant blades with no standard blade. This observational study compared intubation times and subjective ease of intubation for seven different laryngoscope blades chosen to represent major design differences. The 30 subjects recruited were either A&E senior house officers with no previous anaesthetic experience or A&E nurses who had completed either the Advanced Paediatric Life Support or Paediatric Advanced Life Support courses.

The subjects were deliberately chosen as trained staff who may be called on to attempt emergency intubation but have very little practical experience of this skill. Each subject was asked to intubate a standard infant manakin a total of three times with each blade in a randomised order. Average times to intubation and subjective scores for ease of use were compared using a seven point Likert scale. Intubation times with these two blades were approximately twice as long (30 seconds v 15 seconds) as with the other blades. Two blades, the Seward and Soper, were of a Z shaped profile compared with all the others with a C shaped profile (Robinshaw, Oxford, Wisconsin, Miller). It is therefore recommended that A&E departments should have a range of laryngoscope blades available for use in the emergency department but the first choice blade should be C shaped.

Analogic use in the paediatric accident and emergency department
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Aim—to assess analgesic use and the use of a pain scoring system on the introduction of a credible system of monitoring the above to a paediatric accident and emergency (A&E) department with a history of injury due to trauma.

Methods—A random sample of patients who presented to a paediatric A&E department,
over a six week period with a history of limb trauma were prospectively studied. Pain severity scores were assessed on arrival and at 10, 30, and 60 minutes using the Douhit facial scale and any analgesia given or plaster application was noted.

Results—During the study period 172 patients were seen in the A&E department. The median age was 10 years (range 3 to 13 years) and the majority, 56%, were male. The mean initial pain scores were 2.7 (range 0 to 4) for boys and 5.0 (range 0 to 4) for girls. None of the children reported face 0, suggesting all were in some pain. The presenting injuries were 103 upper or lower limb fractures and 69 "soft tissue" injuries. Only 84(49%) of patients received analgesic medication in the department (30% morphine; 70% paracetamol), analgesia was not given to the remaining 88(51%). Of these, seven declined analgesia, and five had already taken analgesia on arrival at the A&E department. Despite prompt triage (median time 2 minutes, range 0 to 10), the median time from arrival to paracetamol administration was 20 min (range 4 to 105) and for morphine was 14 min (range 0 to 57).

Conclusions—Pain is the commonest symptom in patients presenting to the A&E department. Because the assessment of children’s pain can be particularly difficult, a pain scoring system such as the Douhit scale can be a useful means of pain assessment in the paediatric A&E setting. Despite increased awareness, pain is still undertreated in the paediatric A&E department.

An audit of paediatric telephone advice—does it influence access to health care? P O Brennan, J G Yassa Accident and Emergency Department, Sheffield Children’s Hospital NHS Trust, Western Bank, Sheffield S10 2TH

There is a perception that telephone calls asking for medical advice make up a significant part of the workload of any accident and emergency (A&E) department and in the recent White Paper, the Government is to encourage telephone advice lines. In order to justify and plan such a provision in the A&E department of a children’s hospital we analysed 1396 telephone inquiries for advice. These were logged on to a proforma to determine a profile of the workload and nature of the calls. The advice given was logged and departmental records were studied 48 hours after each call to find out whether the parents had followed the advice on whether or not to bring the child to the department.

The study showed that the distribution of calls mirrored the distribution of new patient attendance to the department; 92% of inquiries came from parents and grandparents and advice on only 15 conditions comprised over 95% of the workload. Over 80% callers followed advice on whether or not to attend the department. However, 27% (147) of callers who were advised to bring the child failed to do so. This group needs further consideration. Only 35% patients about whom calls were made were actually attended the department. This study enabled us to justify a properly planned and resourced telephone inquiry line. It defined the times when the service could be absorbed by existing staffing levels and when it would need extra staff. It also helped define the grade of nurses necessary to staff the line and what training and guidelines would be needed. It is helping us to shape the new service.

When do ankle injuries get better? D Burke, N A J Rashid Accident and Emergency Department, Sheffield Children’s Hospital NHS Trust, Western Bank, Sheffield S10 2TH

A prospective study was undertaken to determine the optimum time to review ankle sprains. All adults admitted to the accident and emergency department with ankle sprains of sufficient severity to warrant a radiograph and, after exclusion of a fracture, prescription of crutches were eligible for inclusion. All patients were treated with Tubigrip and prescribed ibuprofen 400 mg six hourly as required and were given a standard advice sheet. Patients were randomised to follow-up at seven, 10, or 14 days after injury. Patients who failed to attend for review and who did not reattend within 28 days were deemed to be non-attenders.

Table 2 shows a summary of the results. There was no significant difference in the non-attendance rate between the seven and 10 day review groups ($\chi^2=1.84, p=0.1$), but a significantly greater proportion of those seen at seven days required a follow up appointment compared with those seen at 10 days ($\chi^2=21.28, p<0.001$). There was a significantly greater non-attendance rate in the 10 day review group than in the 10 day review group ($\chi^2=35.21, p<0.001$) but there was no significant reduction in the need for follow up appointments ($\chi^2=0.35, p=0.1$). The results suggest that 10 days is the optimum time to review ankle sprains.

When are abdominal $x$ rays appropriate in children? S Jones, R Walther, C P J Charlton, J Somers, L Williams Departments of Accident and Emergency Medicine, Paediatrics and Radiology, University Hospital, Queen’s Medical Centre, Nottingham NG7 2UH

There are no established guidelines for the use of an abdominal $x$ ray (AXR) in children despite this being frequently performed for conditions such as a constipation. Approximately 100 AXRs are requested in children each month at the Queen’s Medical Centre many of which show no diagnostic information when reported.

We aimed to develop guidelines for the use of abdominal films in children. We therefore reviewed retrospectively over a three month period notes and $x$ rays of every third child aged $\leq$15 years in whom an AXR was requested in the accident and emergency (A&E) department on medical, surgical, obstetric, and in outpatients including requests from general practitioners.

We assessed the appropriateness of AXR (based on previously agreed criteria defined by senior medical and radiology staff), the specialty and grade of doctor requesting, whether any useful diagnostic information was gained, and if management was influenced.

Of 100 AXRs, 69 were requested by the A&E department; 74 were requested by senior house officers. Twenty eight films were requested appropriately, 76 had no specific diagnostic information, and in only 18 out of 100 cases did the AXR influence management.

In conclusion the AXR was a poorly used diagnostic tool, was often requested unnecessarily by junior staff and rarely influenced management.

Following our study we have introduced guidelines for performance of AXR in children and await the impact of this strategy.

An alternative to “brutacaine”—a comparison of low dose intramuscular ketamine with intranasal midazolam in children before suturing R G McClone, S Ranasinghe, S Durham 16 Devon Road, Lancaster LA1 3ES

Objective—To compare the use of low dose intramuscular ketamine with high dose intranasal midazolam in children before suturing.

Methods—102 children with simple wounds between 1 and 7 years old were allocated to the two study groups.

Results—Two children were excluded from the study because of deviation from the agreed protocol. The 50 children in the ketamine group were less likely to cry or need to be restrained during the procedure than those in the midazolam group (p<0.01). The median oxygen saturation was 97% in both groups. There was no difference in the recovery behavior and the range of time at which children were ready for discharge although the median time for the latter was shorter in the midazolam group (75 vs 82 minutes). Vomiting occurred in nine of the ketamine and four of the midazolam group. After discharge both groups had an unsteady gait (73% vs 71%) which usually resolved within two hours.

Conclusions—Intranasal midazolam (0.5 mg/kg) effectively sedated the children in that none could remember the suturing. However a significant number still had to be restrained (86% vs 14%). Intramuscular ketamine (2.5 mg/kg) produced dissociative anaesthesia in the majority of cases and was the preferred drug of nurse, doctor, and parent.

Note: By April we should also be in a position to present the results of a follow up study comparing the use of intramuscular midazolam (0.4 mg/kg) with and without intranasal flumazenil.

Ultrasound in emergency medicine: a literature review P Peman Department of Emergency Medicine, Auckland Hospital, Private Bag 92024, Auckland 1, New Zealand

The use of ultrasound has become accepted practice in many emergency departments in
Chest compression with expired air ventilation has been the gold standard for basic life support since its description by Kouwenhoven in 1960. The technique has been shown to improve survival in out-of-hospital cardiac arrest when combined with early advanced life support. Recent studies have shown that output from cardiac arrest in the swine, dog, and rat models is as good with chest compressions only as with conventional cardiopulmonary resuscitation (CPR). No studies evaluating the technique in humans have been published.

Because conventional CPR has been shown to be effective, it would be unethical to initiate an outcome study comparing it with chest compressions only. We therefore decided, as an initial step, to determine whether chest compressions could generate the minimum tidal volume of 400 ml recommended for effective basic life support.

Eight adult victims of out-of-hospital cardiac arrest intubated and undergoing CPR on admission to the accident and emergency (A&E) department were studied. During the study admission the tube was checked for placement and the absence of an audible leak. Conventional CPR at a ratio of 5:1 was continued.

Patients were ventilated with 1000 ml oxygen per cycle using a Drager Oxylog 2000 time cycled constant volume ventilator. The total inspiratory volume was measured over the next five compressions. All volume measurements were made with a Micromedical digital volume transducer (resolution 10 ml, accuracy ±2%). Data were recorded for five cycles of CPR per patient.

Data were analysed using the Epi-Info 6 programme. Difference between inspired and expired volumes were compared using the Kruskal-Wallis H test. The median inflation volume was 1000 ml and median expired volume was 925 ml (p<0.00). There was a net expiratory flow of −15 ml per compression. This study suggests that compression only basic life support in the adult cardiac arrest victim is insufficient to deliver minimal recommended tidal volumes for effective CPR. Further evaluation is underway.

Limp in the paediatric population: the accident and emergency perspective

S U Fischer, T F Beattie

Objective—To investigate the epidemiology, assessment, and outcome of atraumatic limp in childhood.

Methods—All patients presenting to a paediatric A&E department over a six month period were studied. This is the only paediatric A&E department for the area. Data were obtained regarding age, sex, predisposing factors, assessment, and outcomes using a proforma.

Results—44 children identified the criteria for inclusion in the study (0.18% of the A&E attendances for the period studied). The male to female ratio was 1.6:1; mean age 5.5 years (range 1 month to 17 years). Eighty per cent presented with a limp, with 34% of the total localising pain to the hip. Symptoms were right sided in 54%, 42% on the left, and 4% bilateral; 45% had a preceding illness. The main diagnosis was "transient synovitis/irritable hip" (40%); no diagnosis was available on discharge in 30%.

Perthes' disease only accounted for 2% of the total. 70% were managed in the A&E department; 12% were admitted and the rest were referred for specialist opinion and management.

Conclusions—Atraumatic limp is a common problem in children presenting to the A&E department. Most can be managed in the A&E and A&E staff and will have a benign outcome. Further studies are needed to identify the role of preceding illness in the aetiology of atraumatic limp.

Early physiotherapy within the accident and emergency department

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Objective—To assess whether a physiotherapy service based in the accident and emergency (A&E) department, with direct, rapid access, affected time taken to recover after an acute limb soft tissue injury.

Methods—Prospective study of adult patients who attended the A&E department with an acute soft tissue injury to the upper or lower limb. The control group were those presenting in the month immediately before introduction of the physiotherapy service. Treatment group patients were seen in the next physiotherapy clinic, held on three mornings a week. All patients were assessed on their outcome via a structured telephone questionnaire at least three months after injury.

Results—39 control patients were compared with 38 patients who received early physiotherapy. The two groups were similar in age, sex, and site of injury. Patients referred for physiotherapy were seen within a mean of 2.2 days and received an average of 5.8 treatments. After introduction of the A&E based service, patients had a significantly reduced time to return to their previous normal activity (p<0.05). This was also significant when specifically comparing patients with knee injuries or with ankle injuries. However there was no effect on time taken off work or time to return to sport, if applicable. Patients who received early physiotherapy made fewer attendances at their general practice and patient satisfaction with the new service was very high.

Conclusions—Access to a physiotherapy service within the A&E department had a significant impact on recovery after soft tissue injury.
Table 4  Accident and emergency training for senior house officers: main findings from questionnaires

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<thead>
<tr>
<th>Formal teaching</th>
<th>Independent performance</th>
<th>Confusion before A&amp;E</th>
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<td>teaching skill</td>
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<td>Debriefing (%)</td>
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<td>Lead A cardiac arrest (%)</td>
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<td>32</td>
<td>33</td>
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<td>Tube thoracotomy (%)</td>
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<td>23</td>
<td>21</td>
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<td>Shoulder reduction (%)</td>
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<td>36</td>
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Accident and emergency training for senior house officers—still a useful apprenticeship
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Objectives—To compare the confidence of senior house officers at performing practical medical procedures before and after working in an accident and emergency (A&E) department. The extent of formal teaching in these skills and opportunity for independent performance of them is also assessed.

Methods—Structured questioning sent to all senior house officers completing an A&E post in the Trent region in August 1997. Basic information about the respondent and the department in which they worked was requested. Inquiry was made of the subjective confidence of the respondents in performing the following procedures before and after working in A&E: use of a defibrillator, team leading a cardiac arrest, performing a primary survey in a trauma patient, insertion of a chest drain, and a dislocated shoulder shouder.

Results—84 replies from 120 questionnaires were obtained giving a response rate of 70%.

The formative assessment of clinical performance of accident and emergency senior house officers by direct observation of doctor/patient consultation skills: a qualitative study
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Objective—To explore the value of direct observation of doctor/patient consultation skills as an assessment and teaching tool within the accident and emergency (A&E) department.

Methods—The outcome from observed consultations is evaluated through the process of triangulation: (i) senior house officer questionnaire and structured interview with a researcher from outside the department: both forms of analysis explore the value the senior house officers place on the style of teaching in particular: the use of reflection (the senior house officer gives immediate feedback on his or her performance) and educational contracts (an approach towards lifelong self-directed learning); (ii) senior house officer appraisal by non-observing senior doctors; and (iii) subjective evaluation by observers: again exploring the use of reflection as a teaching tool, the negotiation of educational contracts, and identification of both individual and common weaknesses. A change in practitioner behaviour is evaluated by observing similar patient/doctor consultations.

Results—Direct observation identifies several common weaknesses that may otherwise be missed by any other form of evaluation/audit. These include establishing patients' hidden agendas, exploring the patients' thoughts and concerns, adequate explanation of any proposed treatment or its medical background (particularly with regards to patient disposal), the efficiency of examination, and perhaps most widely and importantly the entire approach to a doctor/child consultation. The findings have led to clear changes to the departmental training programme. Self-directed learning, through the use of negotiated educational contracts is demonstrated.

Conclusions—Direct observation of doctor/patient consultation skills is a unique and valuable assessment tool within the A&E department. It is both valid and practical. It serves a dual purpose as a useful teaching tool through its promotion of self-directed learning. Opportunities for extending the study to other practitioners are evident.

Proposal for a system of blunt trauma examination which links triage to diagnosis and facilitates decision making
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Diagnosis is the attribution of a pathological name to a medical problem which is arrived at in the accident and emergency (A&E) department via examination. This system incorporates the principle of triage into a system of examination. The system that is taught to doctors in training is still the orthopaedic system of look, feel, move but in A&E it is important to identify major problems at an early stage. The following system is recommended for all blunt trauma:

- **A**B/C
  - Deformity (associated wound, neurovascular problems)
  - Instability (associated wound, neurovascular problems)
  - Haemorrhage
  - Pain on stressing
  - Block to movement (not pain on movement)
  - Signs of soft tissue trauma such as bruised, swelling, focal tenderness.

Loss of functions such as range of movement and strength as assessed by walking, grip/push/pull. Such a system should lead to rapid identification of more serious injuries, cut the number of unnecessary x-rays, and speed examination by omitting unnecessary parts. Reasons and explanations will be given.

Clinical and cost effectiveness of telephone advice for non-urgent calls to ambulance services from an accident and emergency perspective: a pilot study
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Introduction—Previous research has suggested that between 25% and 50% of calls to 999 ambulance services, who subsequently routinely attend accident and emergency (A&E) departments, present with problems which may be more appropriately dealt with through home care advice or primary care. Priority dispatch systems being introduced within ambulance services are providing opportunities to consider new ways of dealing with the non-urgent 999 caller.

Aims—To investigate the clinical and cost effectiveness of providing protocol led telephone assessment and advice to 999 calls, and with problems triaged through priority dispatch as non-urgent.

Methods—999 callers with non-urgent problems were allocated to either an treatment or control group. The intervention group (n=228) received extra nurse led telephone assessment and advice. When appropriate, callers were given the opportunity to seek alternative care and decline their ambulance. At no time were ambulances denied. The control group (n=221) received an ambulance in the usual way. Data were gathered from A&E, ambulance services, hospital and general practitioner records. In addition, patient follow up interviews were conducted to assess clinical outcomes and satisfaction with telephone advice.

Results—Of the intervention group, 48 callers (21%) were offered an opportunity to decline their ambulance. Of these, 33 (69%) chose to decline. Preliminary data analysis shows 96% of intervention group callers felt the nurse listened very carefully, 90% felt the advice was easy to gain from the nurse, 82% felt very reassured by the advice, and 78% were satisfied with the advice.
Disclosure—The data will be used to develop a hypothetical model of the clinical and cost effectiveness of nurse led telephone advice to 999 ambulance callers with non-urgent problems. The implications of this model for A&E departments will be raised.

Analysis of patient flow in and around a major city following centralisation of accident and emergency departments
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The centralisation of accident and emergency (A&E) services is always a controversial subject. Analysis of routinely available computerised data from the three major A&E sites before centralisation and from the two A&E sites after a minor injury unit after centralisation provide an insight into the handling of the A&E workload before and after centralisation. Data will be presented also showing the impact on clinical activity at general hospital A&E departments. Quality of care data such as time to see a clinician and time to admission will be examined. Some of the lessons learned by this process may help others who may be facing similar management changes.

Computed tomography by the accident and emergency department: why 24 hour access is vital
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Objective—To examine the use made of 24 hour access to computed tomography (CT) from an accident and emergency (A&E) department and to assess whether clear benefits for patients could be identified by having such a service.

Methods—A retrospective review of 176 cases where CT scans were ordered by A&E staff of a large teaching hospital over a one year period.

Results—53% of CT scans were done “out of hours”; 97% of scans performed (171 of 176) were studies of the brain. Three examinations were of the cervical spine and two were of the chest. Of 171 head scans 93 were performed for either confirmed or suspected trauma and 78 were done for medical indications. Only 11 of 71 patients who had a head scan for acute trauma required transfer to the regional neurosurgical unit following consultation. Twenty seven patients had a working diagnosis of subarachnoid haemorrhage before scanning. The CT confirmed the diagnosis in 19 cases. In cases where the CT was performed for comatia of undetermined origin or where trauma could not be excluded treatable conditions not clinically suspected were identified.

Conclusions—CT scanning facilities allow comprehensive initial evaluation of the head injured patient and minimise hazardous and expensive transfer of these seriously ill patients. Our experience shows that it is a vital tool in the initial differential diagnosis of the comatose patient and therefore must be available for use by senior and middle grade A&E staff on a 24 hour basis.

Application of a novel and rapid whole blood estimation of D-dimers to screen for deep vein thrombosis in the accident and emergency department
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Clinical diagnosis of deep vein thrombosis (DVT) is inaccurate and some confirmatory test such as venography, plethysmography, or duplex scanning is required. Less than half of the patients are subsequently shown to have a DVT. Patient with venous thrombosis produce circulating D-dimers from the fibrinolytic breakdown of fibrin clot.

SimpliRED is a novel D-dimer assay, easier and faster to perform than latex agglutination or ELISA. During a five months period 120 patients attending the accident and emergency department with suspect DVT underwent screening for DVT with whole blood D-dimer estimations using the SimpliRED test. All patients subsequently underwent venography and light reflexion rheography (LRR) and some underwent duplex scan as well. An effective screening test requires a high negative predictive value (NPV) and is easy to perform. The D-dimer estimations gave an NPV of 92% with the SimpliRED test. All patients with a positive or equivocal screen result should proceed to a definitive test as only 50% D-dimer positive are venogram positive. This compares favourably with our current screening method LRR which has a NPV of 96%. We recommend a screening test for patients attending hospital with suspected DVT rather than all patients undergoing venography. SimpliRED D-dimer estimation in this group of patients is quick (taking less than 5 minutes), easy, and cheap to perform and has the advantage that it requires minimal technical expertise. The high sensitivity has led to it being used routinely in our emergency room and is now part of our protocol for the outpatient screening and treatment of DVT.

Is a skull x ray required following head injury to children, to exclude soft tissue swelling, contusion, or haematoma is the only indication for the x ray?
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Objective—The Royal College of Radiologists has produced guidelines for skull x ray following paediatric head injury. Anecdotal evidence suggests that frontal swelling, contusion, or haematoma following blunt paediatric head injury, in the absence of any other indications for skull x ray, is not associated with skull fractures. The object of this study was to test this hypothesis.

Methods—Over a six month period the records of all children who had a skull x ray were reviewed to determine the mechanism of injury, site of impact, and the indications for the skull x ray. Children who had sustained frontal head injuries with soft tissue swelling, contusion, or haematoma with no other indications for skull x ray had their films reported by one consultant radiologist.

Results—554 children had sustained a head injury. Altogether 258 (47%) had frontal head injuries and of these 72 had frontal soft tissue swelling, contusion, or haematoma as the sole indication for x ray. The sensitivity of the rules was 98% with a specificity of 40%.

The results suggest that the OARs are as valid in children as in adults, although our study did not result in a reduction in the x ray rate. Further analysis and explanation for these findings are offered.
indication for skull x ray—none of these had sustained a fracture. Of the remaining 186 frontal head injuries there were two skull fractures and both of these had other indications for skull x ray.

Conclusions—Guidelines for skull x ray following paediatric head injury, particularly when the sole indication is soft tissue swelling, contusion, or haematoma following frontal injury, needs re-evaluation.

A case of severe hypertension complicated by intracerebral haemorrhage and acute pulmonary oedema

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A 54 year old man collapsed unconscious at home. On arrival at the accident and emergency department he was breathing spontaneously at a rate of 36 per minute and had a pulse of 84 beats per minute. His blood pressure was 300/140 mm Hg by both manual and automated methods. There was no appreciable difference in the pressure recorded between right and left arms. Glasgow coma score was 4 with extensor response and his pupils were equal but unreactive.

In the past he had apparently been investigated for diabetes and had been prescribed atenolol for hypertension. He had suffered no significant previous illnesses and was a non-smoker.

His blood pressure rose steadily reaching a peak of 340/280 mm Hg but his pulse remained at around 80 beats per minute. Electrocardiography showed left ventricular hypertrophy with strain. He then developed acute pulmonary oedema with copious, pink frothy sputum. He was given intravenous frusemide and was incubated and mechanically ventilated as his respiratory effort was deteriorating.

A working diagnosis of malignant hypertension complicated by probable intracerebral haemorrhage and acute pulmonary oedema was made but phaeochromocytoma could not be excluded. After consideration of various antihypertensive agents he was commenced on sodium nitroprusside infusion and his blood pressure gradually fell to 200/150 mm Hg.

Computed tomography was performed which showed a large right parietal haematoma with mass effect and midline shift. This was not operable so he was transferred to ITU where he died 36 hours later.

Points for discussion: (1) Should we have worried about the possibility of phaeochromocytoma? (2) Did we use the most appropriate antihypertensive agent? (3) What level of blood pressure should we have been aiming to maintain?

Heart failure out in the cold: the risks of an ecstasy tablet

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A young man was brought to the accident and emergency department in extremis by his friends. He had a respiratory arrest shortly after arrival due to gross pulmonary oedema and required immediate intubation and ventilation. He was found to be hypothermic with a core temperature of $30^\circ$C.

It later transpired that he had earlier ingested an ecstasy tablet and gone to sit outside because he felt unwell. He was found several hours later. His cardiac failure was associated with myocardial stunning. After a prolonged ITU admission he was discharged home.

Ecstasy is normally associated with hyperpyrexia. This unusual presentation is a reminder that drug intoxication may not present in a textbook fashion. The effects of ecstasy and the proposed hypothesis for the way in which this man presented are discussed.

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