

UK and Europe: Administration

159 IDENTIFYING THE DEMOGRAPHIC DETAILS AND MOTIVATIONS OF 'PRIMARY CARE ATTENDEES' ATTENDING AN A&E DEPARTMENT

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Introduction: In a drive to identify strategies to contain our expanding A&E department workload we have explored the demographic details and motivation of the 'Primary Care Attendees', as defined by the British Association of Accident and Emergency Medicine, in the document "The Way Ahead". This will allow us to generate a variety of strategies aimed at reducing this inappropriate use of scarce A&E resources.

Subjects: 2344 consecutive patients who attended our A&E department between 25/6/01 and 02/07/01.

Methods: Patients were interviewed, on presentation, to identify if they fulfilled the criteria of 'Primary Care Attendees' and determine their demographic data and motivations for attending A&E rather than primary care.

Results: Of the 2344 patients who attended 320 (13.65%) were deemed Primary Care Attendees (PCA). Of these 320, 56% were male and 44% female. The percentage was lower at the weekends than in midweek – debunking a common held A&E myth (min PCA 9.76% on Monday – max PCA 18.2% on Wednesday). The reasons for their attendance included; 25.6% did not think of going to their GP, 23.1% had lost confidence in their GPs management of their condition and were seeking a second opinion, 20.9% were advised by the GP to attend and 15% reported they could not get a GP appointment. Surprisingly, dispelling more commonly held preconceptions, only 2.5% were advised to attend by a GP receptionist and 4.6% attended A&E due to them deeming it more convenient than their GP.

Comments: This study highlights the need for educating patients and primary care teams about the respective roles of modern A&E departments and primary care and ensuring patients can access and make the most appropriate use of the services available to them.

159a INFLUENCE OF THE SEASONAL VARIATION ON EMERGENCY DEPARTMENT (ED) UTILIZATION PATTERNS, CHIEF COMPLAINTS AND ED OUTCOMES AT AN URBAN TEACHING HOSPITAL

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Objective: To know the different factors associated with the origin of the demand at the ED, the type of the complaints and their final destination at different seasonal periods will allow us to use the resources more effectively.

Design: An observational descriptive study. A comparison among four periods of one week duration distributed along the four seasons of the year.

Setting: The ED of a 1,000 bed-teaching hospital in Barcelona, Spain, which attends about 110,000 emergency visits per year, excluding paediatrics and obstetrics.

Type of participants: All emergency visits attended at the ED during the following weeks of the year 2000: the second of May, the last of July, the third of November and the third one of January.

Main outcome measures: Data collected from the clinical charts data concerning sex, age, referral patterns, main diagnosis and final destination.

Results: The total number of ED visits were 7,806 (1,917 in Spring, 1,940 in Summer, 1,948 in Autumn and 2,001 in Winter). There were no significant differences regarding sex and age among the periods. Referral patients from general practitioners were significantly increased during the Winter week (21 % versus a mean of 17 %). Respiratory complaints and Neuro Surgery were increased in Winter and General Digestive Surgery patients were increased in Spring. Hospital emergency admissions and diversions to other centres were significantly increased in Winter (17 % versus a mean of 13 % and 3 % versus a mean of 1 %, respectively). There were no differences in the outpatient clinics diversions.

Conclusion: There are significant differences in the referral pattern, the main diagnosis and the final destination of the ED visits during the Winter period.

160 A DELPHI STUDY TO IDENTIFY PERFORMANCE INDICATORS FOR EMERGENCY MEDICINE

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Aim: The aim of this study was to identify performance indicators thought to reflect the quality of patient care in the Emergency Department.

Methods: A three round accelerated Delphi study was conducted by email or fax. A panel of 34 experts drawn from the fields of Emergency Medicine, Emergency Nursing, professional service users and patients were consulted. They were asked to propose performance indicators that reflected the quality of care given in the Emergency Department setting in the U.K. and then score these proposals using a 9 point Likert scale. These scores were analysed using SPSS for Windows and the statements reaching consensus were identified. Finally the scores of the proposed indicators not reaching consensus were returned to the panelists to reconsider in the light of group opinion. Consensus was defined as 80% of the group scoring 6 and above or 4 and below.

Results: 224 performance indicators were proposed. 36 indicators reached consensus after round three as reflecting good departmental performance. 24 of these 36 were measures of process.

Conclusions: 36 potential indicators of good quality of care in the Emergency Department have been identified.

161 PERFORMANCE OF EMERGENCY PHYSICIANS DURING CONSECUTIVE NIGHT SHIFTS

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Objectives: To determine whether the number of consecutive night shifts worked has a significant effect on the cognitive performance of Emergency Department doctors.

Design: Prospective Observational Study. All Emergency physicians were subjected to daily cognitive function testing at the beginning and end of 7 consecutive 12hour night shifts. A subjective fatigue scale, previous sleep, alcohol and caffeine intake were recorded in addition.

Setting: The Emergency department of Poole General Hospital.

Participants: All senior house Officers (age range 26–29 years, 5 female 1 male) working one week long set of night shifts.

Main outcome measures: Objective Cognitive Function Testing using two psychologically evaluated computer models - The Williams Inhibition Dual Task Test and Simple Reaction Time Test. A visio-perceptual verbal test administered by the registrar at days 4 and 7 - The Stroop Test. Subjective Likert Fatigue scales. Of interest were the differences in scores on nights 1, 4 and 7.

Results: There was no significant reduction in objective performance or subjective fatigue of emergency physicians working a set of seven serial night shifts (Night 4 vs. Night 7 $p > 0.05$). There was no significant difference between performance at the start or end of individual shifts (pm vs. am $p > 0.05$). There was however a significant difference in subjective tiredness at the end of every shift ($p < 0.05$) but this was not significantly different between nights 4 and 7.

Conclusions: On the data available so far attending emergency doctors do not deteriorate in cognitive performance or subjective fatigue after 7 consecutive night shifts. However, more subjects need to be recruited before valid conclusions can be drawn.

162 MAKING MORE EFFICIENT USE OF EMERGENCY PHYSICIANS TIME

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Objective: To determine the proportion of time spent by Emergency Department Senior House Officers (Residents) in an English University Teaching Hospital performing tasks that could be delegated to a technician should one be available

Methods: This study was performed in the Emergency Department of Addenbrookes Hospital, Cambridge, which is an 823 bed University Teaching Hospital during the first week of December 2001. A single trained observer was attached to each individual Senior House Officer throughout their entire shifts during the study period. The time taken for every activity performed by each Senior House Officer during their shift was documented in real time using a recording system that consisted of 28 different codes. This study was preceded by a

pilot study in which the same group of doctors recorded their own activities during their shifts.

Results: Ninety three percent (93%) of the total time spent on duty in the Emergency Department by all Senior House Officers during the study period of seven consecutive days (168 continuous hours) was accounted for. The results showed that on average 15% of Senior House Officers time was spent performing duties that could have been delegated to a technician. Subgroup analysis revealed that during the night shifts this figure increased to 24%.

Conclusion: This study shows that the presence of appropriately trained medical technicians in Emergency Departments will save a significant amount of the time spent by Emergency Physicians with each patient. This should enable a given number of doctors to see more emergency patients within a given time period, particularly during the night shift, which should help to decrease patient waiting times. We believe that this is the first study of its type to focus on Emergency Department Senior House Officers in the United Kingdom.

163 REFORMING EMERGENCY CARE

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Since May 2001, the emergency department at North Cheshire Hospitals Trust has been one of the two national pilot sites involved in the Ideal Design of Emergency Access Programme (IDEA). This is a two year programme led by the National Patients Access Team (NPAT).

The objectives of the programme are threefold.

- (a) To reduce the overall patient journey time.
- (b) To reduce the process variability within the pathway of care.
- (c) To improve the patient and carer experience.

These objectives apply to all patients accessing emergency care whether it be at primary or secondary care level.

The paper describes the use of process mapping to identify hot spots (unnecessary waits/failures in service) in the patient's journey. Mapping showed that patients only come into contact with staff for 18 per cent of their total time spent in the emergency department.

A number of PDSA (plan, do, study, act) cycles are described. These are means by which small changes are introduced and analyzed. By identifying a named doctor to see all paediatric patients, 63.5 per cent of all children are seen within one hour (compared with 42.5% prior to the change).

The use of demand and capacity measurements at bottlenecks (such as X-ray) is presented – and how these measurements can direct changes that reduce the mismatch between demand and capacity and thus reduce the queues.

It is likely that the learning from this project will be rolled out to other emergency departments in the next year or two.

163a THE PSYCHOLOGICAL BURDEN OF INJURY: THE EMERGENCY MEDICINE AND CLINICAL PSYCHOLOGY INTERFACE

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Introduction: The presentation will be divided into four short sessions which will address different aspects of the interface between Emergency Medicine and Clinical Psychology.

The session will commence with a general introduction to recognized psychological responses that can follow traumatic events and why their recognition is important in the management of trauma.

The Emergency Physician's perspective: The next session will cover the evidence for psychological morbidity following trauma, outline the size of the problem in relation to patients attending the Emergency Department (ED), and outline risk factors for developing these disorders. It will outline some of the approaches to awareness and detection of psychological problems which the clinician might consider appropriate for their ED or acute ward. In addition, the role of litigation in the development of psychological symptoms following injury will be explored and discussed.

The Trauma Psychologist's perspective: The role of the trauma psychologist within the acute health care setting will be outlined in this session, with emphasis on the response to major disaster, ED staff support and staff management. This will particularly focus on the existing evidence about the role of staff debriefing.

Future challenges: Finally, the presentation will conclude with a discussion about future research in relation to the identification and subsequent management of patients at risk from psychological morbidity. This will include using clinical and biological predictors to identify at-risk patients and the role of neuroimaging as a tool to identify changes in brain activity which may assist in defining future treatment strategies. Time will be given for discussion and questions throughout the presentation.

164 WIRELESS HANDHELD COMPUTER ACCESS TO AN ELECTRONIC PATIENT RECORD IMPROVES AVAILABILITY OF CLINICAL DATA IN 25 PER CENT OF PATIENT REVIEWS

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Introduction: Clinical decision-making depends on data, yet important clinical data is often not available when decisions are being made. Using wireless handheld computers, we made clinical data available at the moment of clinical decision-making and identified cases in which the same data was not available to clinicians using traditional means of data gathering.

Objectives: Assess the effect of wireless handheld computers on availability of clinical data at the point of clinical decision-making.

Methods: A prospective observational study in a 900-bed urban hospital in Washington, DC. Our in-house emergency medical informatics team developed a web-based wireless handheld computer system providing real-time access to Electronic Patient Record (EPR) data including laboratory and X-ray results, prior history, dictated notes, medications, and x-ray images. Traditional resources for data gathering included a PC-based EPR as well as paper charts and telephone queries. During the study period, daily patient reviews were observed while traditionally gathered clinical data was discussed and clinical decisions were made. We identified recent laboratory and radiology results that were available using the handheld computer but were not available to physicians using other data-gathering methods at the time of clinical decision-making.

Results: 110 patient reviews were observed. In 28 of those reviews (25.5% of reviews) recent test results were available through the handheld computer that had not been available to clinicians through traditional means. In each case, clinical decisions had been made without knowledge of the newer results.

Conclusion: In our study, the handheld computers highlighted inefficiencies in the traditional delivery of clinical data. Clinical decisions in 25% of patient reviews were based on incomplete data. Wireless handheld computer systems can improve availability of clinical data at the moment of clinical decision-making.

165 WIRELESS HANDHELD COMPUTERS CAN INCREASE VOLUNTARY UTILISATION OF COMPUTERISED PRESCRIBING SYSTEMS IN THE EMERGENCY DEPARTMENT

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Introduction: Hand-written prescriptions contribute to a significant number of potentially avoidable medical errors. Computer-based prescribing systems are a potential solution because they provide a complete, legible prescription and can screen for known allergies, pertinent medical conditions, and drug-drug interactions. Physician acceptance of computer-based prescribing depends on many factors. We investigated the effect of mobile wireless handheld computers on voluntary utilisation of computer-based prescribing systems within a busy urban emergency department.

Objectives: Assess the effect of adding wireless handheld computers on the utilisation of computerised prescribing systems in an emergency department.

Methods: A prospective observational emergency department study in an urban hospital in Washington, DC. A web-based wireless handheld computer system, providing real-time access to Electronic Patient Record (EPR) data with a prescription-writing interface, was added to an existing EPR system that already permitted (but did not require) computerised prescribing using a desktop PC. The numbers of hand-written and computer-generated prescriptions were recorded before and after introduction of the wireless handheld computers.

Results: 475 patients received 167 prescriptions during the study period. Before the introduction of the wireless handheld computers, 59% of all prescriptions were computer-generated and the remainder (41%) were hand-written. After handheld computers were introduced, 73% of all prescriptions were computer-generated, and only 27% were hand-written. Physicians who already used the desktop computer to write prescriptions were more likely to use the handheld computer than were physicians who did not use the desktop computer.

Conclusion: The availability of wireless handheld computers can increase voluntary utilisation of computerised prescribing systems in an emergency department.

166 MAKING AN IMPACT ON EMERGENCY DEPARTMENT FLOW: IMPROVING PATIENT PROCESSING ASSISTED BY CONSULTANT AT TRIAGE

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Background: Pressures on Emergency Departments have never been higher to see more patients, more quickly, and meet more targets. There are many suggested models of improving the flow and clinical effectiveness of managing patients presenting as an emergency, and many models for who should provide the initial screening consult (ISC). Triage, or ISC, does not commonly involve a physician in the U.K., and there has been little standardisation of models of training and seniority for the triage clinician.

Objective: To test the hypothesis that an initial screening consult (ISC) by a senior clinician is a cost effective way to improve patient flow through, and reduce waiting times in, a busy metropolitan teaching hospital Emergency department (ED)

Methods: A comparison study known as the IMPACT project to assess the differences in ED waiting times with ISC by ED Consultant at triage versus our usual Manchester triage system. All patients who would normally be directed to the triage area were seen by the senior clinician team consisting of senior ED nurse and ED consultant, with ISC performed by Consultant, for a total 16 hours per week, in four hour blocks, 0900–1700 Monday-Friday, for three month period. Comparison with similar four hour blocks of normal triage during the three month period. The aim was to expedite care by ordering xray and laboratory tests, and performing therapeutic interventions or redirecting patients where appropriate. Some patients were discharged home from triage. The waiting time in the majors, minors and triage areas of the ED were assessed every 2 hours during the study and comparison periods. An anonymous patient satisfaction survey form was filled in by the patient at the end of their episode of ED care. Telephone follow up at one week was attempted for all IMPACT patients discharged home from triage whose ED number ended even.

Results: Waiting times in the department fell dramatically during periods of IMPACT. The average wait for patients to be seen in the minors area fell from around 4 hours or more at peak times to under an hour. Patients reported being mostly very satisfied with episode of care, and having waited much shorter, than expected. No adverse outcomes of IMPACT patients discharged from triage were detected from telephone follow up.

Conclusions: Patient processing is improved, waiting times fall, and patient satisfaction increases with senior clinician triage. As no extra staff were employed IMPACT was cost neutral, although extra resources would be required for it to be sustainable. Further work will assess process improvements from ISC of ambulance cases and those patients not seen initially in the triage area.

167 ISO-RESOURCE MAPPING AS A METHOD OF MEASURING RESOURCE CONSUMPTION OF EMERGENCY ADMISSIONS

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Knowledge about resource consumption and utilisation is vital in modern healthcare environments. In order to manage both human and material resources efficiently, a typical approach is to group the patients based on common characteristics. The most widely used approach in Australia is driven by the Case Mix funding formula, namely to classify patients according to diagnostic related groups (DRGs). Although DRGs, the basic tool for performance based funding of inpatient activity in Victorian Hospitals, can appear clinically meaningful, our experience suggests that DRG groupings do not necessarily present a sound basis for relevant knowledge generation. In this

paper, we propose an alternative grouping of the patients based on a neural clustering approach, which generates homogeneous groups of patients with similar resource utilization characteristics. Demographic information for patients admitted from the emergency department at Frankston Hospital in Melbourne Australia, was collected from the hospital's Victorian Emergency Management Database (VEMD) and the Victorian Inpatient Management Database (VIMD) between July 1997 and June 2001. The data was processed using Neural Shell, a Neural Based Network Algorithm application to generate the clusters. The clusters reveal interesting differences in resource utilization patterns unable to be explained by traditional analysis of DRGs. A detailed case study of patients presenting to the Emergency Department at Peninsula Health, Frankston Campus who are admitted to an inpatient service and as an admitted patients under care of the Department of Emergency Medicine is presented. The study demonstrates the quality of knowledge generated by this process. The proposed approach can therefore be seen as an evidence-based predictive tool with high-knowledge generation capabilities.

Critical care/Airway/Anaesthesia/Analgesia

168 RAPID SEQUENCE INTUBATION FOR TRAUMA PATIENTS IN SCOTLAND

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Objective: Rapid sequence intubation (RSI) is now accepted as the technique of choice for securing the airway in trauma patients who require intubation in the emergency department (ED). This can be performed by an anaesthetist, an intensive care doctor or a suitably trained and experienced emergency physician (EP). We aimed to identify any differences between anaesthetists and emergency physicians with regard to RSI in trauma patients in Scotland.

Methods: Prospective, multi-centre observational study of RSI in the EDs of seven urban Scottish teaching hospitals which contribute data to the Scottish Trauma Audit Group (STAG) - an ongoing national audit of trauma care. Data were collected prospectively on every intubation attempt for two calendar years commencing 11 January 1999. STAG data (RTS, ISS, operative details, length of ICU stay) were collected as part of routine audit. The datasets were merged and analysed.

Results: 201 STAG patients were identified who had had an RSI. Patients who were intubated by emergency physicians had a higher ISS (median 26 v 25, Mann-Whitney of rankings $p=0.024$) and a lower RTS (median 5.03 v 5.97, Mann-Whitney of rankings $p=0.006$) than those intubated by anaesthetists. Trauma patients in the EP group were more likely to be intubated within 15 minutes (50.6% v 18.9%, $p<0.001$, Chi square). Mortality was 33.7% for EPs and 27% for anaesthetists ($p=0.385$). Although there was no difference in the proportion of Grade I and II views at laryngoscopy between the groups ($p=0.110$), anaesthetists had a significantly higher first attempt success rate than EPs (89.2% v 74.2%, $p=0.010$, Chi square). There was no difference in observed complications (10 patients in the EP group and 12 patients in the anaesthesia group, $p=1.0$, Chi square).

Conclusion: Emergency physicians and anaesthetists have comparable success, complication and mortality rates for trauma patients undergoing RSI in the emergency department.

169 RAPID SEQUENCE INTUBATION IN SCOTTISH URBAN EMERGENCY DEPARTMENTS

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Background: Airway care is the cornerstone of effective resuscitation. In UK practice, anaesthetists and emergency physicians provide this care. The aim of this study was to determine current practice for rapid sequence intubation (RSI) in emergency departments in Scotland.

Methods: Two year, multi-centre, prospective observational study of endotracheal intubation in the emergency departments of seven Scottish urban teaching hospitals.

Results: 1631 patients underwent an intubation attempt in the emergency department and 735 patients satisfied the criteria for RSI.

Abstract 171

| Minute Volume | Operational Oxygen Requirements | | | | | | | | | |
|---------------|---------------------------------|------|------|------|------|------|------|------|------|------|
| | 80 | 240 | 390 | 550 | 710 | 860 | 1020 | 1170 | 1330 | 1490 |
| 3 | 80 | 240 | 390 | 550 | 710 | 860 | 1020 | 1170 | 1330 | 1490 |
| 4 | 110 | 320 | 520 | 730 | 940 | 1150 | 1360 | 1560 | 1770 | 1980 |
| 5 | 130 | 390 | 650 | 910 | 1170 | 1430 | 1690 | 1950 | 2210 | 2470 |
| 6 | 160 | 470 | 780 | 1100 | 1410 | 1720 | 2030 | 2340 | 2660 | 2970 |
| 7 | 190 | 550 | 910 | 1280 | 1640 | 2010 | 2370 | 2730 | 3100 | 3460 |
| 8 | 210 | 630 | 1040 | 1460 | 1880 | 2290 | 2710 | 3120 | 3540 | 3960 |
| 9 | 240 | 710 | 1170 | 1640 | 2110 | 2580 | 3050 | 3510 | 3980 | 4450 |
| 10 | 260 | 780 | 1300 | 1820 | 2340 | 2860 | 3380 | 3900 | 4420 | 4940 |
| 11 | 290 | 860 | 1430 | 2010 | 2580 | 3150 | 3720 | 4290 | 4870 | 5440 |
| 12 | 320 | 940 | 1560 | 2190 | 2810 | 3440 | 4060 | 4680 | 5310 | 5930 |
| 13 | 340 | 1020 | 1690 | 2370 | 3050 | 3720 | 4400 | 5070 | 5750 | 6430 |
| 14 | 370 | 1100 | 1820 | 2550 | 3280 | 4010 | 4740 | 5460 | 6190 | 6920 |
| 15 | 390 | 1170 | 1950 | 2730 | 3510 | 4290 | 5070 | 5850 | 6630 | 7410 |
| time/min | 10 | 30 | 50 | 70 | 90 | 110 | 130 | 150 | 170 | 190 |
| cylinder | vol / ltrs | | | | | | | | | |
| C | 170 | | | | | | | | | |
| D | 340 | | | | | | | | | |
| E | 680 | | | | | | | | | |
| F | 1360 | | | | | | | | | |
| G | 3400 | | | | | | | | | |
| J | 6800 | | | | | | | | | |

Emergency physicians intubated 377 patients and anaesthetists intubated 355 patients. There was no difference in median age between the groups but there was a significantly greater proportion of males (73.2% v 65.3%, $p=0.024$) and trauma patients (48.5% v 37.4%, $p=0.003$) in the anaesthetic group. Anaesthetists had a higher initial success rate (91.8% v 83.8%, $p=0.001$), achieved more good views (defined as Cormack-Lehane Grade I and II) at laryngoscopy (94.0% v 89.3%, $p=0.039$) and experienced fewer immediate complications than emergency physicians (8.7% v 12.7%, $p=0.104$). Emergency physicians intubated a higher proportion of patients with physiological compromise (91.8% v 86.1%, $p=0.027$) and a higher proportion of patients within 15 minutes of arrival (32.6% v 11.3%, $p<0.0001$).

Discussion: Anaesthetists achieve more good views at laryngoscopy with higher initial success rates during RSI, but emergency physicians perform RSI on a higher proportion of critically ill patients and a higher proportion of patients within 15 minutes of arrival. Complications are fewer in the anaesthetists group, but this may be related to differences in patient populations. Training issues for RSI in the emergency department are currently a topic of debate. Complication rates for both groups are in keeping with previous studies.

170 EMERGENCY INTUBATION BY EMERGENCY PHYSICIANS AND ANAESTHETISTS IN AN URBAN TEACHING HOSPITAL

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Introduction: Early and effective management of the airway is essential in the care of the critically ill patient. Advanced airway interventions may be performed by anaesthetists or suitably trained Emergency Physicians (EP) depending on local policies. This study reports on practice in the emergency department of a large, urban teaching hospital and examines the transfer of these patients to their final destination.

Materials and methods: This is a prospective, observational study. A proforma was completed for every patient in whom endotracheal intubation was attempted in the emergency department between 11.01.99 and 05.10.01.

Results: Data were collected on 857 patients. Rapid Sequence Intubation (RSI) was performed in 434 patients. 252 patients were in non-traumatic cardiac arrest. Regarding the RSI group, EP were the 1st attempt speciality in 62%. Anaesthetists obtained more 'good' laryngoscopic views (Cormack-Lehane grade I or II) than EP (96% versus 89%, $p=0.044$). Anaesthetists also achieved a higher 1st attempt success rate (93% versus 84%, $p=0.015$) with fewer complications (6.6% versus 16.4%, $p=0.005$). Median time from leaving the emergency department to arrival at final destination was 75 minutes (range

5 to 270 minutes). 46% of patients went to CT, 22% directly to ITU and 26% to the mortuary. Peri-transfer documentation was minimal/absent in most cases.

Discussion: In this hospital it is common for EP with training and experience to perform advanced airway management including RSI. The complication rate in the RSI group was higher for EP. The transfer of patients from the emergency department to final destination is poorly documented and of variable duration. A definitive transfer document is being developed. A co-operative policy has been developed between Anaesthesia/Critical Care and Emergency Medicine to increase the training and experience of EP in airway management.

171 THE HOPE OXYGEN TRANSPORT CHART

Authors not supplied. Address not supplied

Objectives: To produce an simple table for the calculation of the oxygen required for the safe transport of ventilated patients.

Method: We calculated the theoretical oxygen consumption of the Oxylog 100 ventilator operating over a range of minute volumes and plotted it against anticipated journey time. We adjusted the value obtained to take into account any anticipated variables.

These were:- The manufacturer stated a tolerance of 20% in the minute volume delivered. The ventilator is oxygen driven and has a fixed oxygen requirement per cycle. A minimum pressure of oxygen is required to operate the ventilator. The non-ideal behaviour of compressed oxygen and the effect of temperature. Any adjustment was made on a "worst case scenario" basis. The calculated values were then doubled. This allows a large safety margin for unforeseen events.

Results: The results are shown in the table.

Conclusions: The table is easy to use. It allows rapid calculation of the quantity of oxygen required for the transport of ventilated patients. It limits the risk of a mathematical error being made in what can be a time critical and stressful situation. A wide safety margin has been built in.

Medicine

172 CAN BODY SURFACE MAPPING (BSM) SYSTEM CAN DETECT MYOCARDIAL DAMAGE BETTER THAN THE 12 LEAD ECG IN THE EMERGENCY DEPARTMENT?

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Background: The 12 lead ECG is the only reliable method of immediately diagnosing AMI in patients presenting with chest pain.

Abstract 172, Table 1 Performance of standard 12 lead ECG

| | | Gold standard for AMI | |
|-------------|----------|-----------------------|----------|
| | | Positive | Negative |
| 12 Lead ECG | Positive | 14 | 11 |
| | Negative | 13 | 122 |

Abstract 172, Table 2 Performance of Body Surface mapping

| | | Gold standard for AMI | |
|-----|----------|-----------------------|----------|
| | | Positive | Negative |
| BSM | Positive | 17 | 23 |
| | Negative | 10 | 110 |

Abstract 172, Table 3

| | 12 Lead ECG | Body Surface Mapping |
|-------------------|--------------|----------------------|
| Prevalence of AMI | 15% | 15% |
| Sensitivity | 52% (44–60%) | 63% (55–70%) |
| Specificity | 92% (87–96%) | 83% (72–89%) |
| Positive LR | 6.27 | 3.64 |
| Negative LR | 0.52 | 0.45 |

However, it is limited by the location of the V leads. BSM uses multiple (80) leads to interrogate the entire myocardium.

Method: This is a blinded diagnostic test study. Patients presenting with chest pain compatible with myocardial ischaemia were potentially eligible. Eligible patients had a BSM and a 12 lead ECG taken within 30 minutes of each other in the emergency department. The BSM treating physician was blinded to the result. A panel blinded to any clinical information subsequently read the data. The diagnosis of myocardial damage was made on an enzymatic gold standard (12 hour Troponin T or serial CKMBs).

Results: 415 patients were enrolled in the trial. Data on 160 patients is currently available (see tables).

These early results suggest that BSM may have an increased sensitivity for the diagnosis of AMI. However, this increase in sensitivity may occur at the expense of specificity. An a-priori power study indicates that the final study will have sufficient power to determine if these findings are statistically significant. Final analysis of the entire cohort will be presented at the conference.

173 EVALUATION OF AN ULTRA-SHORT 'RULE OUT MYOCARDIAL INFARCTION' (ROMI) PROTOCOL FOR LOW RISK PATIENTS PRESENTING WITH CHEST PAIN TO AN EMERGENCY DEPARTMENT CHEST PAIN EVALUATION UNIT

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Introduction: Chest pain is a common presenting complaint in Emergency Medicine. The symptom is poorly specific as an indicator of significance. It can also represent a spectrum of pathology from Musculoskeletal chest pain to Myocardial Infarction.

Aims: The aim of this study was to evaluate the safety and effectiveness of a new 90 minute Rule Out Myocardial Infarction protocol for Low Risk patients presenting with chest pain.

Methods: A 2 bed Chest Pain Evaluation Unit (CPEU) was established in the ED. Patients presenting with chest pain were screened for a number of exclusion criteria based on history or electrocardiographic (ecg) findings. Patients underwent a physical examination and had Cardiac Markers (Troponin I, CKMb and Myoglobin)

taken at presentation, and 90 minutes later. A second electrocardiograph was taken at 90 minutes. If cardiac markers remained within normal limits, the ecg was unchanged and no cardiac cause for chest pain was found on examination, the patient was discharged and advised to attend a general practitioner for follow up. All discharged patients were followed up at one week by telephone. Patients were referred for admission if there were any ecg changes or if enzyme markers were elevated.

Results: 91 patients were assessed in the CPEU during a 6 week evaluation period. 47% were discharged home. 53% were admitted. All patients discharged from the Emergency Department were well when contacted at follow up except for one patient who had been discharged after referral for admission and who re-attended 5 days later with ecg changes and elevated cardiac markers.

Discussion: A number of Emergency Department ROMI protocols have been suggested in the past though few have utilised as short a time frame as this one. An early evaluation of this 90 minute protocol suggests that it may be a safe and effective tool in the management of Low Risk patients presenting to the emergency department with chest pain. However numbers in the evaluation period were small. An ongoing evaluation of the protocol is in process at two sites.

174 RANDOMISED CONTROLLED TRIAL OF A CHEST PAIN OBSERVATION UNIT VERSUS ROUTINE CARE

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Background: The Chest Pain Observation Unit (CPOU) is a recent development in the management of patients presenting to hospital with acute, undifferentiated chest pain. We aimed to determine whether use of a CPOU would- 1) Reduce the proportion of patients admitted to hospital with chest pain, 2) Reduce the proportion of patients with an acute coronary syndrome inadvertently discharged home, and 3) Improve patient centred measures of health.

Methods: Whole days were randomised to "CPOUopen" or "CPOUclosed". On "CPOUopen" days, patients were managed according to CPOU protocols. On "CPOUclosed" days, patients were managed at the discretion of the emergency physician. All patients with chest pain were screened for eligibility according to specific criteria. Eligible patients were invited to attend a review clinic (two days after initial presentation) for electrocardiograph and troponin T measurement. Patients completed self report health questionnaires (SF-36, Euroqol and Hospital Anxiety Depression Scale) at two days and one month. Recruitment will end in April 2002 with over 900 patients recruited.

Results: To date, 332 days have been randomised, and 722 patients recruited. Follow up rates are- 100% for primary outcome, 87% for review clinic, 74% for initial questionnaire and 68% for one month questionnaire. Six month interim analysis shows that CPOU open days achieve a significant reduction in admission rate (31% v 54%), and non-significant trends towards reduction in inappropriate discharge and improvement in patient centred health. Complete data for all outcomes will be presented.

Conclusion: Interim analysis suggests that a chest pain observation unit reduces admission rates for chest pain. Final trial data will be presented to determine whether CPOU also reduces inappropriate discharges and improves patient centred health.

175 EFFECT OF SINGLE BOLUS THROMBOLYSIS ON DOOR TO NEEDLE TIME

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The purpose of this audit was to determine the effect of a single bolus thrombolytic compared with the use of Streptokinase and t-PA on door to needle time.

The National Service Framework for CHD has set very clear targets for the administration time for thrombolysis. By April 2003 the door to needle time must be 20 minutes in 75% of eligible patients. This has proven to be a challenge, currently 45% of patients are receiving thrombolysis within 30 minutes of arrival to the A&E department.

An initial audit was undertaken to identify possible areas for improvement. This audit highlighted the time taken to prepare and administer the thrombolytic. Preparation of both Streptokinase and t-PA required reconstitution and the setting up of infusion pumps, taking on average 12 minutes. It was considered that a potential reduction in preparation time of the thrombolytic from 12 minutes to 3 minutes would confer a significant reduction in the door to needle time.

In the second phase of the project, patients admitted to the A&E department with ST elevation myocardial infarction who met the criteria for thrombolytic therapy received TNK. An independent observer recorded the time from the attending physician's verbal order for treatment to the time the nurse attached the syringe to the venous cannula. The study was powered to detect a 9 minute difference in preparation time, with the data from the first audit being used as the control.

As changes in staff awareness and hospital organisation lead to shorter door to needle times, the relative importance of drug preparation time is likely to increase. Choice of thrombolytic agent may significantly influence performance against the new standards.

176 HOW USEFUL ARE CLINICAL FEATURES IN PATIENTS WITH SUSPECTED PULMONARY EMBOLUS?

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Background: The patient with suspected pulmonary embolus (PE) is a frequent diagnostic challenge in emergency medicine. This study was undertaken to determine which clinical features were predictive of a diagnosis of PE.

Method: A retrospective study, of patients presenting with suspected PE, to a UK emergency department was undertaken. Patients were followed up for six months following their initial attendance. Logistic regression analysis was used to determine which features were predictive of PE.

Results: 222 patients were included in the study. PE was diagnosed in 54 (24.8%) patients. Univariate logistic regression demonstrated that the following features were predictive of PE: age >55, recent immobilisation or major surgery (IM), recent lower limb trauma or surgery (TR), clinical deep vein thrombosis (DVT), dyspnoea, cough, pulse rate >110, respiratory rate > 25 and oxygen saturations > 94 %. All the above features were entered into a multivariate logistic regression model. This showed that age >55 ($p=0.03$, odds ratio (OR) 2.39), IM ($p=0.04$, OR 4.76), TR ($p=0.007$, OR 10.96), DVT ($p=0.03$, OR 4.02) and oxygen saturations > 94 % ($p=0.008$, OR 0.35) were significant predictors of pulmonary embolism.

Conclusion: Several clinical features have been identified which would mandate investigation in patients with suspected pulmonary embolus. No features have been identified which would negate the need for further investigation.

177 ISCHAEMIA MODIFIED ALBUMIN (IMA™) IS MORE SENSITIVE THAN THE PRESENTATION 12 LEAD ECG TO DETECT PATIENTS WITH CORONARY ARTERY DISEASE (CAD)

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The 12 lead ECG is the first test performed on patients attending ED with acute chest pain. However, rigorous studies based on post mortem diagnosis show that ECG diagnostic sensitivity for coronary artery disease is only 41–61%. The admission ECG, although excellent for selecting patients for thrombolysis, has a diagnostic sensitivity for myocardial infarction of 55–75%. The ECG has limitations regarding the diagnosis of CAD in patients with acute chest pain (i.e.: disagreement among readers, lack of detection of small areas of ischemia, and presence of confounding baseline patterns). Ischemia Modified Albumin (IMA) measured by the Albumin Cobalt Binding (ACB™) Test has shown promise as a marker of ischaemia in patients with or without myocardial necrosis. We have compared the sensitivity of IMA with that of presentation 12 lead ECG in patients attending the emergency department with chest pain suggestive of myocardial ischemia.

Methods: We enrolled 68 patients, 50 male, 18 female, mean age 59 (range 37–84) \pm 10.7 years, with symptoms of acute myocardial ischaemia. Venous blood was drawn at presentation for IMA. IMA is based on the observation that the exposure of circulating albumin to ischaemic myocardial tissue results in a modification of the protein that decreases its binding capacity to exogenous cobalt. We used a cutoff of 85 U/mL to define IMA positive based on a previous normal range study. We defined positive coronary artery disease as the presence of a coronary angiogram >70% stenosis in any epicardial vessel. A positive ECG was defined as ECG ST elevation > 1mm, ST depression > 1mm, new T wave inversion > 2mm.

Results: Using IMA alone to predict a positive coronary angiogram gave a sensitivity of 75%, specificity 50%, positive predictive value (PPV) 88%, and negative predictive value (NPV) 30%. Using the presentation 12 lead ECG alone to predict a positive coronary angiogram

gave a sensitivity of 35%, specificity 91%, positive predictive value (PPV) 95% and negative predictive value (NPV) 23%. The combined test (IMA or ECG positive = positive; IMA and ECG negative = negative) versus positive angiography or final diagnosis of stable or unstable angina gave a sensitivity of 90%, specificity 55%, PPV 93%, and NPV 45%.

Conclusions: IMA has a greater sensitivity (>2-fold) than ECG used alone. Moreover, it considerably increases the predictive value of the ECG for CAD.

178 BIPHASIC ANAPHYLAXIS IN A UK EMERGENCY DEPARTMENT

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Objectives: 1. Ascertain the incidence and significance of biphasic anaphylaxis in emergency department patients. 2. Determine the interval between initial and recurrent reactions. 3. Identify predictive factors for biphasic reactions. 4. Compare our findings with previous studies and suggest an evidence-based post-recovery observation time

Method: Retrospective review of patients admitted with acute anaphylaxis at a UK emergency department. Anaphylaxis defined as an acute, allergic reaction involving two or more body systems. Biphasic reaction defined as recurrent symptoms requiring intravenous, intramuscular, subcutaneous, or nebulised therapy after a period of remission. Remission period defined as an interval of one hour or more during which no treatment was required. Details of past medical history, the presenting features of the reaction, treatment, and subsequent clinical course, were abstracted from the hospital notes.

Results: 103 episodes were identified in 91 patients. 1(1%) was fatal, 4 (2%) were protracted reactions, 9 (9%) were biphasic. In one the second phase was more severe than the first. In 8/9 biphasic reactions remission lasted under 6 hours. 1/9 occurred after 35 hours. No significant differences were found between patients with and without biphasic reactions in allergen, presenting symptoms and signs, treatment given or time to receive treatment.

Conclusions: This is the largest study of its kind to date. We found the incidence of biphasic anaphylactic reactions in the ED population to be 9%. Neither the likelihood nor the severity of the second phase can be predicted. The literature confirms our finding that the majority of delayed reactions occur within 8 hours. Little is gained by a policy of 24 hour admission. We suggest discharge 8 hours after response to treatment, provided patients understand the possibility of recurrent symptoms and can return quickly to hospital should these occur.

Trauma

179 LACK OF CHANGE IN THE PROCESS AND OUTCOME OF TRAUMA CARE IN ENGLAND AND WALES SINCE 1994

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Objective: To demonstrate trends in trauma care in England and Wales from 1989 to 2000

Study population: Database of the Trauma Audit and Research Network which includes hospital patients admitted for 3 days or more, those who died, were transferred or admitted to Intensive Care area.

Method: In order to demonstrate trends in outcome, severity adjusted odds of death per year of admission to hospital were calculated for all hospitals ($n=99$) and 20 hospitals who had participated since 1989 (adjustments are for Injury Severity Score, age and Revised Trauma Score). The grade of doctor initially seeing the injured patient in A&E and median pre-hospital times per year of admission were calculated to demonstrate trends in the process of care. Trend analyses were carried out using simple linear regression (odds ratio vs. year).

Results: The analysis shows a significant reduction in the severity adjusted odds of death of 3% per year over the 1989–2000 time period ($p<0.001$). During the period 1989–1994 the odds of death declined most steeply (on average 6% per year $p=0.004$). Between 1994–2000 no significant change occurred ($p=0.35$). This pattern was mirrored by the 20 permanent members where the odds of death also declined more steeply over the 1989–1994 period. The percentage of severely injured patients (ISS >15) initially seen by a consultant increased from 10 to 24 from 1989–1994 but has decreased to 19%

subsequently. Pre-hospital times for severely injured patients have not changed significantly since 1994 (51 to 45 minutes).

Conclusion: The majority of the case fatality reduction for trauma patients reaching hospital over the 1989–2000 time period occurred prior to 1995 when there was most marked change in the initial care of severely injured patients.

180 DEVELOPMENT OF A CLINICALLY USEFUL TOOL TO PREDICT PSYCHOLOGICAL MORBIDITY FOLLOWING INJURY

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Introduction: Traumatic events leading to accidental injury produce psychological disturbance among vulnerable individuals such as Post-traumatic Stress Disorder, anxiety disorders and depression. Intervention studies to date have adopted a 'spray and pray' approach with all patients following injury, without targeting those who may be at-risk of developing such disorders. In terms of efficient service development, the ability to screen for patients likely to develop significant psychological morbidity would seem desirable and possible. In order to do this, reliable indicators of a normal versus an abnormal response need to be identified. This study aims to identify predictors of psychological morbidity following accidental injury among a cohort of Emergency Department (ED) patients and use these to develop a tool which may be clinically useful.

Participants, methods and results: 823 ED attenders (16 to 70 years) following accidental injury were recruited over an eighteen-month period. Baseline assessment documented demographic and accident-related details, psychological symptoms (Hospital Anxiety and Depression Scale (HAD)) and personality trait (Eysenck Personality Inventory). Follow-up at one and three months documented physical progress, psychological symptoms using HAD, PTSD symptoms using the Revised Impact of Events Scale (RIES), involvement in litigation, pain and coping strategies. Follow-up rates at one month were 79% and three months, 69%. Risk factors were identified from 20 variables documented at the baseline or one-month interview. Modeling of the one-month responders using univariate analysis identified significant predictors from the original 20 in relation to the outcomes (HAD and RIES). Multivariate linear regression subsequently identified the group of variables most predictive of outcome and suitable for development into a clinically useful tool.

Comment: Modeling using linear regression techniques has identified risk factors for psychological outcome following injury. Further work is needed to test the model in a clinical setting such as the ED, acute ward or Primary Care centre.

181 IMPROVING HEAD INJURY OUTCOME PREDICTION: THE USE OF TIME-ADJUSTED SERUM S-100B LEVEL

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Introduction: Head injury is the leading cause of death and disability in the most productive years of life. The incidence of disability for those thought to have relatively minor injuries is now known to be higher than previously anticipated. One approach to improving outcome prediction has been the measurement of serum markers released after injury, whose levels reflect brain tissue damage. Protein S-100B has shown promise as such a marker. Interpretation of serum levels after injury is complicated, however, by its seemingly rapid clearance. A relatively short half-time (25 minutes) has been demonstrated in patients undergoing cardiopulmonary bypass procedures. A similar effect is thought to occur after traumatic brain injury, although definitive clearance characteristics have yet to be established. Rapid clearance from serum would affect comparison of levels in patients with blood taken at varying times after injury. We aimed to estimate the clearance characteristics following head injury, and use this to time-adjust S-100B levels measured in a previous outcome prediction study.

Methods: Half-time was estimated by collecting serial blood samples from adult patients with mild traumatic brain injury presenting to the Emergency Department. (n=9) Curve-fit analysis was used to find the elimination constant, from which the half-time was calculated. This was then used to standardize S-100B levels for the time elapsed between injury and sampling in 122 patients whose neurological outcome had been assessed at one month. Comparison between adjusted and non-adjusted S-100B measurements as a predictive test for severe disability was made using ROC (Receiver Operator Characteristics) plots.

Results: The half-time was 97 minutes (95% C.I. 75–136). The area under the curve of the ROC plot for time-adjusted S-100B levels as a predictive test for severe disability was 0.91 (95% C.I. 0.82–0.99 p<0.0001). Area under the curve for non-adjusted measures was 0.89 (95% C.I. 0.791–0.985 p<0.001)

Conclusion: The half-time of S-100B following mild traumatic brain injury is around 97 minutes. Adjusting for the time elapsed between injury and sampling of S-100B improves the accuracy of outcome prediction based on its level in serum.

Paediatrics

182 MORTALITY FROM POISONING IN CHILDREN IN THE UK: 1978–1997

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Introduction: We present data indicating toxicological causes of death in children (<15 years). In the twenty-year period ending 31st December 1997 there were 1865 deaths due to a variety of toxins. The most common causes were related to smoke inhalation: toxic effects of carbon monoxide-782; toxic effects of polyester fumes and smoke-721.

Methods: Data was collected from the Office of National Statistics under headings of age, sex, date of death and primary and secondary causes of death as recorded on the death certificate.

Results: Of the 1865 deaths, 1503 were secondary to toxic effects of carbon monoxide, polyester fumes and smoke, all relating to house fires. Antidepressants accounted for 55 deaths whilst a group including distalgesic and the aromatic analgesics paracetamol and phenacetin accounted for 40. The next largest groups were the opiates (27), butane/propane (15), acetone and other hydrocarbon solvents (15). Salicylates accounted for 8 deaths, as did each of barbiturates, iron and hydrogen cyanide. There were more male deaths (994) than female (871), the difference first being noticed in the third year and disappearing by the ninth year.

Conclusions: The most common toxicological cause of death in children is secondary to smoke inhalation in house fires. Drugs are the next most common, with antidepressants associated with the greatest mortality. Opiates continue to be a significant cause of death as do the aromatic analgesics and distalgesic, however salicylates are no longer a significant factor, thus continuing a trend reported in a similar study in 1980. All the deaths from the inhaled hydrocarbon gases (butane/propane, freon etc.) were clustered in the 12–15 year age groups, whereas there were no deaths from iron toxicity over the age of 3 years.

183 ISABEL : A WEB-BASED DIFFERENTIAL DIAGNOSTIC TOOL FOR EMERGENCY PAEDIATRICS: RESULTS OF AN INITIAL EVALUATION

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Objectives: To test the accuracy and the safety of a Web-based differential diagnostic tool (ISABEL) for a set of case histories collected during two phases of evaluation, Phase I: hypothetical cases provided by clinicians and Phase II: real clinical presentations to emergency paediatric departments.

Design: Prospective, descriptive study.

Setting: Acute paediatric units in 2 teaching and 2 district general hospitals in the South-East of England.

Materials: Sets of summary clinical features and their expected diagnoses from Phase I (hypothetical cases provided by participating clinicians in August 2000) and final diagnoses from Phase II (real children presenting to the participating acute paediatric units between October and December 2000).

Main outcome measures: Presence in the ISABEL output list of a) the expected or final diagnosis and b) all clinically significant diagnoses for each case, as decided by an expert panel.

Results: 99 hypothetical cases from Phase I, and 100 real-life case scenarios from Phase II were included in the study. ISABEL displayed the diagnosis expected by the clinician in 90/99 hypothetical cases (91%). Cases from Phase II evaluation covered a range of paediatric specialities and represented 55 unique final diagnoses. ISABEL displayed the final diagnosis in 83/100 real cases (83%) and the complete set of all clinically significant diagnoses for each case in 73/100 (73%) cases.

Conclusion: ISABEL was safe and accurate in generating differential diagnoses for a variety of real as well as hypothetical case scenarios.

184 ARTIFICIAL NEURAL NETWORKS TO PREDICT DISPOSITION IN CHILDREN WITH BRONCHIOLITIS

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Background: Artificial Neural Networks, (A.N.N.), apply complex non-linear mathematical functions to pattern recognition problems. They are trained with known input and output values and then applied to previously unseen cases. Bronchiolitis is a common lower respiratory tract infection in infants.

Objective: To train an A.N.N. ensemble to predict disposition of children with bronchiolitis.

Methods: The training data was obtained from a retrospective chart review of children admitted to a children's hospital over a one-year period. Cases for the chart review were identified from hospital inpatient enquiry, (H.I.P.E.), data. The initial decision to admit was made by a non-consultant hospital doctor, (NCHD). A consultant reviewed all patients within 24 hours. Those who were discharged within 24 hours were retrospectively classified as suitable for discharge. A single reviewer extracted predetermined variables from each chart. These data were used to train A.N.N. ensembles to predict disposition. The A.N.N. ensembles were then tested on cases not previously seen by them using a modified bootstrapping technique.

Results: One hundred and nineteen cases were reviewed of which 37 were discharged within 24 hours. Twelve clinical variables were used for A.N.N. training. The A.N.N. ensembles correctly classified patient disposition in 81% (range 75%-90%) of the test cases presented to them. These results were statistically significant, $p < 0.0001$.

Conclusion: A.N.N.s can be trained to predict disposition in children with bronchiolitis. This has implications for the development of decision support systems that may be incorporated into electronic medical records to increase patient safety.

184a PAIN RELIEF IN THE PAEDIATRIC POPULATION

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Over the past few years there has been a greater awareness of the need to both recognise and treat pain in the Paediatric population. As recently as 1994 Sacchetti *et al* documented very poor analgesia provision for the Paediatric population. When compared to the adult population this was particularly dreadful.

The recent surge in interest in analgesia provision is not without its problems. The ideal route and the method of delivery needs to be clarified. The assessment of pain relief is not without its difficulties.

This paper will focus on the historical situation with regard to pain relief in children and bring the story up-to-date. There will be a discussion on the various forms of pain assessment and the problems inherent with each. This will then be followed by an up-to-date discussion of the various methods of pain delivery that will include:

- Non-pharmacological methods of pain relief
- Pharmacological methods of pain relief
- Discussion on the merits and demerits of various drugs involved

A paradigm for analgesia provision for the Paediatric population will be provided for discussion.

Pre-hospital: EMS

185 PRE-HOSPITAL CARE: THE EVIDENCE BASE: THE AUSTRALIAN PRE-HOSPITAL CARE RESEARCH REGISTER, A MODEL FOR INTERNATIONAL COLLABORATION?

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Purpose: "The science of pre-hospital care is scanty". This study aimed to answer two questions: what is the state-of-the-art of the

evidence-base for pre-hospital care; and, what is the current status of pre-hospital care research in Australia?

Methods: A literature review was undertaken to identify systematic reviews, defined as reviews of randomised controlled trials, of pre-hospital care and a critical analysis performed. To identify the current status of pre-hospital care research in Australia, a proforma was developed, trialed and distributed to 800 individuals and organisations, including ACEM. The principle investigator also visited each capital city meeting with clinical leaders of the ambulance service and at least one emergency department.

Results: Only 3 "systematic" reviews of pre-hospital care were identified. Two of these included all aspects of pre-hospital care during the period 1984-1995/6, while the other, a Cochrane Collaboration review, covered only trauma from 1966-2000. The Australian study identified only 91 projects, however, only one was a RCCT. The majority of studies were clinical, with cardiac arrest and trauma predominating and were based in ambulance services. There were many unpublished projects and the local and national pre-hospital care research network is not well developed.

Conclusions: Although this Australian study was not a systematic review, there are commonalities with the findings of three recent systematic reviews, eg. scarcity of RCCT's, poor methodology, lack of research culture, ethical considerations and funding. The Australian Pre-Hospital Research Register is now establishing local partners with the aim to prospectively register major projects, facilitate information sharing, and develop a network and agenda in pre-hospital care research in Australia. Such development is consistent with developments in other countries. This model may provide a suitable base for international collaboration.

186 PRE-HOSPITAL CARE: THE EVIDENCE BASE: IS THE COCHRANE COLLABORATION RELEVANT TO PRE-HOSPITAL CARE?

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Purpose: The Cochrane Collaboration is an international organisation of health professionals and consumers. It "prepares and maintains systematic reviews of the effectiveness of health care, and disseminates them widely to influence decisions about health care provision and practice". The Collaboration celebrates its 10th anniversary this year. This paper asks, "is the Cochrane Collaboration relevant to pre-hospital care"?

Method: An analysis of the objectives, structure, strategic plan, collaborative review groups, and the Cochrane Library was undertaken to determine their relevance to pre-hospital care.

Results: Through its international Centres, one of which is located in Australia and another in the UK, the Collaboration maintains an extensive and active network of collaborative review groups, Cochrane fields, and methods working groups who identify randomised controlled clinical trials (RCCTs) in health care. Members prepare systematic reviews using a standard protocol and maintain the Cochrane Database of Systematic Reviews which is regularly updated and made widely available through the Cochrane Library, distributed quarterly on a CD-ROM. Many review groups include topics related to pre-hospital care, however, there is no cross-review group co-ordination in pre-hospital care. There are few (9) systematic reviews directly applicable to pre-hospital care, of which one has been influential. Members of the Cochrane Centres are "collaborative" and helpful. The Cochrane Library contains a rich resource, particularly the philosophy and methods of evidence-based practice. However, the evidence base of pre-hospital care, if judged on RCCT's alone is "scanty".

Conclusion: The Cochrane Collaboration is relevant to pre-hospital care, provides a solid internationally accepted and growing structure for improving the evidence base of pre-hospital care, would be enriched by creating a pre-hospital care Network in the Collaboration and, is commended to those interested in advancing the science of pre-hospital care.

187 SUGGESTING A REVISED "CHAIN OF SURVIVAL" FOR THE NEW MILLENNIUM

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The "Chain of Survival", designed in the early 1980's, has been a major "lighthouse" guiding emergency cardiac care since that time.

The WHO MONICA Project 1985–1990 shows that, of those who die in an acute coronary event, 60%–70% die before reaching hospital – “the community is really the ultimate coronary care unit”. In Australia, the mortality rate from acute coronary heart disease is approximately 175 per 100,000 per year, however, the event rate is approximately 450 per 100,000 per year.

The current “chain of survival” focuses on the former, ie. out-of-hospital cardiac arrests, which requires “death” as entry into the “chain”. Despite advancements in knowledge, clinical practice, professional and community education, and service delivery to strengthen each of the links in this chain, outcomes from out-of-hospital cardiac arrest remain universally poor.

The current “chain of survival” does not accommodate individuals with an acute coronary event who remain “alive”. Studies since the 1980’s have demonstrated that “myocardium can be saved”, with improved clinical outcomes, as a result of aspirin, thrombolytics and other early cardiac interventions in non-fatal, acute coronary events. These interventions are time-dependent, however, studies consistently show delay in the time to coming under care is in excess of the optimum timeframe.

A “chain of survival” for the new millennium must explicitly include both those who have an acute coronary event but are alive, as well as those who are already in cardiac arrest, and must also address the phenomenon of “delay”. This paper proposes and substantiates such a “Chain of Survival” to provide the blueprint for resuscitation endeavours in the new millennium.

188 THE UNEXPECTED BENEFITS FROM THE IMPLEMENTATION OF THE ADVANCED MEDICAL PRIORITY DISPATCH SYSTEM (AMPDS) IN A LARGE METROPOLITAN AMBULANCE SERVICE

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Purpose: AMPDS is an internationally used, medically predetermined, structured system for call takers in emergency medical dispatch centers. In 1996, the (Melbourne) Metropolitan Ambulance Service introduced the AMPDS concurrently with a computer assisted dispatch (CAD) system and an “ambulance response grid”. This paper describes the implementation of AMPDS and reports on some unexpected benefits identified during an evaluation conducted in 2000/01.

Method: The setting is a large, publicly funded metropolitan ambulance service serving a population of 3.5m, which uses a private, combined emergency services dispatch centre. A case study model was used to examine the implementation of AMPDS.

Results: This project was a major technology and cultural change for the ambulance service. The core outcomes expected of the system were achieved. Unexpected benefits were identified, including: the production of a frequency distribution table for each response determinant at the point of call taking, a tool not previously available, which has enabled evidence-based decision making; a structured tool to enable triage of appropriate cases, which enabled the implementation of a new fire department-based first responder program; identification of a large cohort of “sick persons” who probably didn’t require an ambulance response and for whom alternate care strategies are currently being trailed; more appropriate resource allocation and risk analysis; identification of clinical events for further studies; and, provided the basis for the subsequent introduction of in-field direct electronic data entry of patient information by Paramedics.

Conclusion: Despite some initial concerns, AMPDS has provided greater benefits than expected and has led to improved decision-making in managing this ambulance service’s emergency responses. Further studies are indicated to determine the sensitivity and specificity of selected determinants.

189 THE PHYSICIAN RESPONSE UNIT: A MODEL OF PREHOSPITAL CARE

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Introduction: The Physician Response Unit (PRU) is a pilot service set up jointly by The Royal London Hospital (RLH) and London Ambulance Service (LAS). It represents a model of physician led prehospital medical care to Category A emergency calls, by means of a rapid response vehicle, in the east central sector of London. A descriptive analysis of the first 6 months of operation will be presented.

Results: Since its inception in July 2001 the PRU has attended some 386 Category A emergency calls. The most frequent calls attended were collapse/unconscious 19% (74/386), chest pain 13.7% (53/386), difficulty breathing 13.7% (53/386), seizures 12.9% (50/386) and road traffic accident 7.25% (28/386). There were 21 patients seen as a result of crew requests for assistance. Of the 372 patients seen, 80.2% (n=300) were conveyed to hospital and 13.1% (n=49) were assessed and managed at home thereby preventing attendance at the emergency department. Of the 300 patients conveyed a medical escort was provided in 27.3% (n=82) of cases. Medical therapy was initiated before arrival in 30% (115/372) of patients. Notably 1 patient received pre-hospital thrombolysis and 2 underwent rapid sequence intubation. A 12 lead ECG was performed in 21% (78/372) of patients. There was a 35% (81/230) admission rate for patients conveyed to the RLH. Of those patients managed at home 37 attended follow up with their GP, 1 attended the emergency department the next day and 11 could not be followed up.

Conclusions: Integration of a doctor into the prehospital phase provides continuity of care, directed referral and early medical intervention where necessary. With close interagency working some ambulance callouts can be averted and home management of selected patients according to standard operating procedures can be achieved preventing unnecessary attendances to an emergency department. The future direction of this service will be subject to ongoing evaluation.

190 CAN TELEMEDICINE IMPROVE PATIENT CARE? CLINICAL BENEFITS OF THE GRAMPIAN DTI PROJECT

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Introduction: This pilot study, based in the Accident and Emergency department of a major teaching hospital, aimed to test the viability of providing specialist advice to a network of 4 remote community hospitals via a telemedicine link. Aberdeen Royal Infirmary Accident and Emergency department sees on average 51,000 new patients per year. There are however large numbers of patients (approximately 40,000 new patients per year) who attend community hospitals within the Grampian region. Inevitably the discrepancy in experience and facilities leads to large numbers of patients being transferred for specialist advice and on going care. This presentation outlines the range of conditions for which advice was sought indicating the usefulness of telemedicine in the clinical setting.

Methodology: Telemedicine workstations were placed in each of 4 community hospitals allowing 24hr access via videoconferencing to A&E and related specialist care. Usage of the link over a 12-month period was monitored, as was the nature of injuries treated. Consultation was recommended prior to transfer of a patient to definitive care. Follow up and on going care of injuries by telemedicine was encouraged.

Results: Over the 12-month period of the study 298 consultations took place. These were regarding conditions ranging from cervical spine fractures to soft tissue injuries. Transfer was avoided on 187 occasions, representing approximately 17,000 patient journey miles saved. Transfer was deferred in 21 cases, allowing attendance at an appropriate outpatient clinic. Often patients requiring hospital admission were admitted directly to the appropriate specialty thus avoiding A&E.

Discussion: The primary effect of consultation by telemedicine prior to transfer was to reduce the over triage of patients felt to require hospital care. The experience of patients requiring admission is improved; often admission direct to the relevant specialty can be arranged obviating the need for A&E attendance. (This project was funded by the Department of Trade and Industry and in conjunction with the Remote Health Care Unit of the Department of General Practice, Aberdeen University).

Disaster

191 CHEMICAL PERSONAL PROTECTIVE EQUIPMENT AND USER PHYSIOLOGY

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Aims: To determine the effect of chemical personal protective equipment (CPPE) ensembles on user physiology during the decontamination of chemically contaminated casualties.

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| | Median (25 th , 75 th Percentile) | | CPPE | Control |
|---|---|-------------------------|---------|---------|
| | Z | p value | | |
| Weight Difference (Kg) | -0.200 (-0.350, -0.150) | -0.150 (-0.187, -0.012) | -0.3071 | 0.002 |
| HR Max % Change from Baseline | 153.16 (141.85, 165.53) | 163.02 (148.33, 179.01) | -1.975 | 0.048 |
| RR Max % Change from Baseline | 181.31 (154.15, 209.71) | 173.42 (151.24, 203.28) | -0.447 | 0.655 |
| Skin Temperature Max % Change from Baseline | 101.39 (100.19, 102.79) | 101.83 (100.47, 102.91) | -0.598 | 0.550 |

Methods: Twenty test subjects were recruited. Working as teams of four for a 60-minute period, each carried out the decontamination of standardized simulated chemically contaminated casualties. This 60-minute 'NHS hour' was defined, using the consensus obtained from a Delphi study, to be representative of the tasks that health service personnel would be expected to undertake during the decontamination of chemically contaminated casualties. Each team completed the 'NHS hour' on three separate occasions while wearing a CPPE ensemble, and once while wearing a control ensemble of theatre scrubs. The following physiological parameters were recorded during the 'NHS hour': weight difference, heart rate, respiratory rate and surface skin temperature. We used the Mann-Whitney test to compare weight difference, and the maximum % change from baseline for heart rate, respiratory rate and surface skin temperature, for the two study groups.

Results: The results are shown in the table

Conclusions: While the use of CPPE for one hour does have a statistically significant effect on some aspects of user physiology, the clinical significance of this remains to be determined. Further work is required.

192 PLANNING FOR MAJOR BURNS INCIDENTS IN THE UK USING AN ACCELERATED DELPHI TECHNIQUE

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Background: Major incidents require careful planning if they are to be managed well. Although a generic plan to deal with all major incidents is essential, a number of "special incidents" deserve special consideration because of their potential to impact on specialist services. This paper examines the problems of managing a major incident involving large numbers of burns casualties.

Method: A 3 round Delphi study was conducted using a multidisciplinary panel of experts from prehospital care, emergency medicine, burns surgery, intensive care and emergency planning. The Delphi study explored prehospital, receiving hospital and burns centres issues through all phases of the major incident response.

Results: A series of consensus statements on the management of burns incidents are presented. The results of the Delphi have been synthesised into a number of guidelines and action cards for individuals who will be involved in a major incident response involving large numbers of burns. The specific planning for burns incidents is integrated into the all hazards approach to major incidents operating in the UK. A triage system for patients with burns in major incidents is also presented.

Conclusion: The Delphi technique has allowed the formulation of guidance for the management of burns major incidents. Although specifically tailored to the UK, most of the guidance is Internationally applicable.

Education

193 VIDEO CASE BASED LEARNING. A NEW WAY OF TEACHING DOCTORS NEW TO EMERGENCY MEDICINE

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A recent BMJ editorial by Goldbeck-Wood *et al.* has alerted medical practitioners to the need for observational research whereby quality is as important as outcome in the learning experience. Despite increased

recognition of the educational needs of doctors new to Emergency Medicine their preparation and induction remains less than ideal. Decreased exposure during the pre registration year, time limited induction programmes, limitation of availability of seniors for supervision and the need to become an independent practitioner compromise this ideal. Preparation often consists of didactic instruction from the "hospital expert" with little opportunity for the emergency physician to relate his/her actual shop floor experience and practice. The current system requires maximum Consultant time, minimal clinical exposure, and struggles to address clinical decision making, and safe appropriate management. In an age of digital image we have produced an interactive video (VHS, DVD, CD ROM) which consists of 30 "real" patients presenting their history, examination, and investigation findings, and giving key management summaries of "safe" emergency medical practice. The video is designed to be used independently, or as teaching material for Senior Emergency Physicians.

Hypothesis: In junior doctors without previous Emergency Medicine experience, a stand alone interactive clinical based teaching video is superior to standard topic based lectures in improving knowledge of 12 common Emergency Medicine presentations in a two hour induction programme.

Study design: A randomized controlled trial. 10 Subjects without previous Emergency Medicine experience. As part of first day induction programme, randomised into 2 groups.

Group 1 – 2 hour teaching session consisting of an interactive video covering 12 common Emergency Department presentations, interlaced with relevant questions and answers. Each case is summarized outlining safe appropriate Emergency department management.

Group 2 – 2 hour standard topic based lectures on same 12 cases, containing identical factual information as the video, given by the same senior Emergency Physician who narrates and appears in the video.

Outcome measurement: Short answer factual examination on the 12 topics, 1 week after teaching.

194 A SITE FOR SORE EYES!

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4 am. Emergency Department SHO. Queue includes: "Drunk" head injury patient, Rape victim, Chest pain with abnormal ECG, Wheezy 2 year old Where can I get the help and information I need.

We present the past, present and future of clinical information management. Our single portal, live website, merges evidence based publications with local policies and guidelines. The very latest information relevant to each Emergency Medicine topic is presented. With it's educational focus, use of multimedia in web technology and personalization potential, the site represents real opportunity to integrate shop floor clinical practice with published evidence.

See it (don't weep) at nww.ubht.nhs.uk/edhandbook

195 BESTBETS: THE CRITICAL APPRAISAL DATABASE

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Aims: 1.To compliment the existing dataset of short cut reviews, found at <http://www.bestbets.org/>. 2.To facilitate an interactive, on-line environment where best practice can be disseminated readily and widely.

Methods: Many questions arising from the practice of emergency medicine are not always addressed by the highest quality evidence. Relevant papers brought to a journal club (run by the Emergency

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| Publication Type | Questions for checklist from panel members | Questions from published checklists | Total no of questions in final list |
|---------------------------|--|-------------------------------------|-------------------------------------|
| Generic | 0 | 26 | 26 |
| Case-control | 10 | 26 | 36 |
| Cohort | 7 | 26 | 33 |
| Decision Rules | 3 | 26 | 29 |
| Diagnosis | 3 | 26 | 29 |
| Economic | 8 | 26 | 34 |
| Educational interventions | 10 | 26 | 36 |
| Guidelines | 6 | 26 | 32 |
| Prognosis | 11 | 21 | 32 |
| Qualitative | 14 | 26 | 40 |
| Review/Meta-analysis | 8 | 25 | 33 |
| Screening | 1 | 26 | 27 |
| Survey | 4 | 26 | 30 |
| Trials | 6 | 26 | 32 |

Department at Manchester's Royal Infirmary) often contained useful information despite flaws in research design. Critical appraisal checklists were then introduced at meetings (Crombie, Greenhalgh). These greatly assisted the learning/teaching process by compelling personnel to correctly identify the research design within the paper and then proceed to ask the right questions of the material. A critical appraisal panel of 3 Consultants in Emergency Medicine and one Senior Specialist Registrar set up a timetable by which all published checklists would be harvested, collated into like groupings and evaluated (see table).

Step 1. Three senior informaticists conducted a literature review within the Medline/Cinahl/Embase/Psychlit databases and the Internet. All relevant citations were studied for secondary sources and the final total of 115 checklists were sorted into a rudimentary order by research type.

Step 2. The panel met to discard irrelevant material, confirm collations and establish a core list of standard questions applicable to any trial design. Collated material was shared between members for individual study and revision.

Step 4. New consensus checklist material fed back into journal club and the final 14 checklists forwarded onto the web designer for inclusion to the database.

Results: This new critical database is accessible from Easter 2002. From here, contributors to best evidence topics (BETS) will have the option to appraise an article on-line; answers will be in response to an organized template of questions. Visitors to the website then study these evaluations alongside the relevant BET. This it is hoped will lend transparency to the appraisal process and credence to any clinical bottom line.

International/Societal

196 DOMESTIC VIOLENCE IN A UK EMERGENCY DEPARTMENT, AN INCIDENCE AND PREVALENCE STUDY

Author not supplied. Address not supplied

Background: Studies indicate that domestic violence is common among patients attending Australian, Canadian and US Emergency departments. There is no data about the prevalence of domestic violence in adults attending UK Emergency departments.

Aims: This study was conducted because the reported high rates of domestic violence seemed inconsistent with my own experience. Further hypotheses tested were that victims of domestic violence had increased risks of deliberate self-harm, alcohol abuse and increased use of medical care.

Design: A cross-sectional descriptive study. All adult patients who presented to a single Emergency department, within randomly allocated time blocks, were interviewed by a single researcher. Questions were based on the validated Conflict Tactics Scale and had also been used in a widely cited US study. This was to improve the validity and comparability of the results. This project received ethical approval.

Results: 307 patients were approached for the study. The response rate was 83.4%. 1.8% (95% confidence interval 0.3–5.1%) of patients with current partners were attending as a result of acute domestic violence. The lifetime prevalence of domestic violence among women was 22.1% (95% confidence interval 15.1–30.5) and 22.4% among men (95% confidence interval 15.6–30.4). The one-year prevalence was 5.0% in women and 4.4% in men. These rates were substantially lower than in the US study. The mean age of respondents reporting lifetime abuse was less than those denying abuse. A significant association was found with reported abuse and deliberate self-harm in women (Odds Ratio 75.4 95% confidence interval 13.1–433.7). There was no significant association between reported abuse and: affirmative answers on the CAGE questionnaire, or self reported medical care.

Conclusions: Domestic violence is prevalent in patients attending Emergency departments. It may be becoming more common. The association between domestic violence and deliberate self-harm needs further investigation to see whether this is a causal relationship.

Posters

197 THE WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE (WADEM): FROM MAINZ TO MELBOURNE

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The World Association for Disaster and Emergency Medicine (WADEM) started life as "The Club of Mainz" in 1976 and holds its 13th World Congress in Melbourne in May, 2003. WADEM is an international, humanitarian association dedicated to the improvement of disaster and emergency medicine. This paper traces the history of WADEM, its objective, membership, mission, achievements, and current activities.

The original objective of WADEM was to improve the worldwide delivery of pre-hospital and emergency care during everyday and mass disaster emergencies. Whilst the Association has grown over the years, the founding objective has remained the same: "to work actively to solve technical, scientific and political problems surrounding the management of emergency incidents".

WADEM's membership is multi-disciplinary, international, collaborative, and diverse, welcoming practitioners, researchers, educators, and administrators who are interested, in its core domains of pre-hospital, emergency, disaster, military, and humanitarian medicine.

"Individual members are active in field operations, however, the organization remains non-operational, fulfilling its mission through:

1. Facilitation of academic and research-based education and training;
2. Interpretation and exchange of information through its global network of members and publications;
3. Development and maintenance of evidence-based standards of emergency and disaster health care and provision

of leadership concerning their integration into practice;

4. Coordination of data collection and provision of direction in the development of standardized disaster assessment and research and evaluation methodologies; and,

5. Encouraging publication and presentation of evidence-based research findings in scientific publications and international conferences and congresses". (General Assembly, Lyon, 2001)

Through its peer reviewed journal, *Prehospital and Disaster Medicine*, its biennial World Congresses, collaboration with international organisations such as the WHO, and its Committees and Task Forces, WADEM's leadership makes an important contribution to "Global solutions for Global crises".

198 NEW MILLENIUM, NEW ANTIDOTES? AVAILABILITY OF ANTIDOTES TO ACCIDENT AND EMERGENCY DEPARTMENTS IN THE UK AND IRELAND

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Introduction: The study aims to determine the timeliness of availability of predetermined antidotes to Accident and Emergency Departments in the United Kingdom and Ireland.

Materials and Methods: 312 'major' Accident and Emergency Departments were identified using the 2000-1 edition of the BAEM directory.

- 38 specific antidotes and 28 obsolete antidotes were identified based on recent guidelines.
- Principal Pharmacists were sent a questionnaire to identify timeliness of availability, location and quantity of each antidote in their centre.

Results: 230 of 312 centres replied, a response rate of 74%. The mean number of antidotes held was 30 (median 31). No department held all 38 antidotes. There was no correlation between department size and availability of antidotes.

- Atropine, glucagon, diazepam, naloxone, benzylpenicillin and flumazenil were available in 96-100% of Accident and Emergency Departments in a timely manner.
- Agents such as physostigmine, sodium nitrite, Prussian blue and pralidoxime were poorly available.
- Antidotes to cyanide and to heavy metals were well represented. It is of concern that six centres (3%) had no antidote to cyanide and 15 (7%) had no antidote for toxic alcohols.
- Pralidoxime (antidote to organophosphates) was available in only 111 centres (51%) and in a timely manner in 95 (42%).
- 14 (48%) of the 29 antidotes that ideally should be held locally were being held regionally. 8 of 9 antidotes (81%) that ideally should be held regionally were held locally in a variable manner.
- 28 obsolete agents were identified. All were available to variable degrees. Of concern is that Ipecac and Fuller's Earth were available in 60% and 62% of departments respectively.

Conclusions: The availability of antidotes to Accident and Emergency Departments in the United Kingdom and Ireland is haphazard. Antidotes are not available in a timely manner.

199 NALTREXONE MEDIATED ACUTE OPIATE WITHDRAWAL: AN INCREASING CLINICAL PRESENTATION IN DRUG ADDICTS

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Naltrexone is a long acting opiate receptor antagonist used in controlled withdrawal programmes in drug addicts to maintain opiate abstinence and prevent relapse in former addicts. It acts by competitively blocking the μ and κ opioid receptors inhibiting the effects of exogenous administered opiates. Addicts require to opiate free for a period of 7-10 days and undergo a supervised naloxone challenge before being accepted into a detoxification programme. Accidental or intentional ingestion of naltrexone in opiate dependent individuals will result in an acute blockade of opiate receptors and precipitate a

severe opiate withdrawal reaction. Symptoms of withdrawal can appear after only five minutes following ingestion and may last up to 48 hours. Symptoms include confusion, agitation, hallucinations, sweating, tachycardia, abdominal pain and episodes of profuse vomiting and/or diarrhoea which may result in significant fluid losses. Management is supportive with sedation (benzodiazepines), anti-emetics (metoclopramide), intravenous fluids and non-opiate analgesia (non-steroidal preparations). Anti-spasmodic agents (hyoscine) may be required for intestinal cramps. Opiate administration has no effect and is potentially dangerous. Patients may become extremely agitated and possibly violent requiring restraint, the administration of heavy sedation and possibly general anaesthesia. We present three cases of naltrexone ingestion in opiate addicts precipitating an acute withdrawal reaction requiring sedation, and in one case the administration of general anaesthesia to enable investigation and management of their clinical conditions. The nature, severity and duration of naltrexone induced acute opiate withdrawal varies greatly between individuals and the clinical course of events is unpredictable. With the trend for more addicts to be maintained on naltrexone in the community, and the possibility that current addicts may see naltrexone as a misguided means to break the cycle of drug dependence, the potential exists for increasing numbers of similar presentations. Physicians involved in the emergency care of these patients must be aware of the dramatic clinical course of the ingestion of naltrexone in opiate abusers and be prepared to manage the complications.

200 THE CANADIAN C-SPINE RULE IN THE UK

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Background: The lack of guidelines for referral for plain radiography in suspected cervical spine injury has resulted in considerable variation in practice and inefficient use of radiography. Stiell et al have developed the 'Canadian C-Spine Rule' to allow doctors to be more selective in the use of radiography in alert, stable trauma patients.

Aims: (1) To determine the accuracy, reliability and clinical sensitivity of the rule in the UK setting. (2) To determine the current rate of referral for cervical radiography and to assess the impact of the rule on this rate.

Methods: Prospective cohort study of alert, stable adults presenting with acute blunt trauma to the head and neck ongoing from Dec 2001 to May 2002. In addition to their routine assessment patients are evaluated using the Canadian C-Spine Rule and a data sheet is completed. The decision to refer for radiography is based on the treating doctor's standard practice.

(Preliminary) Results: From Dec 2001-Jan 2002 198 eligible patients have been examined. 153 patients have been enrolled in the study. To date 113 data sheets have been evaluated. (13 were incomplete). Of the 100 completed data sheets 52 patients underwent radiography (52%). 14 patients would not have required radiography if the Canadian C-Spine Rule had been applied. 6 patients not x-rayed would have had radiographs according to the rule. 2 patients with clinically important C-spine injuries would have undergone radiography according to the rule. 75% of doctors were "very comfortable" or "comfortable" using the rule.

Conclusions: The referral rate for cervical radiography in this study is considerably less than in published North American studies. Nevertheless the 'Canadian C-Spine Rule' has the potential to decrease this rate further and to reduce practice variation. Doctors are comfortable with its use.

201 PROSPECTIVE EVALUATION OF NON-RADIOLOGIST PERFORMED EMERGENCY TORSO ULTRASOUND FOR THE DETECTION OF HAEMOPERITONEUM IN ABDOMINAL TRAUMA IN THE UK

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Aims: To evaluate non-radiologist performed emergency torso ultrasound against established investigations for the detection of intra-abdominal blood in patients with abdominal trauma.

Methods: The Focused Assessment with Sonar for Trauma (FAST) technique was performed during the primary survey on adult patients triaged to the resuscitation room with multiple trauma or suspected abdominal injury over a six-month period. All investigations were performed by one of two non-radiologists trained in FAST. The ultrasound findings were compared against the investigation of choice of the

attending surgeon / accident & emergency physician – computed tomography (CT), diagnostic peritoneal lavage (DPL), laparotomy or clinical observation. Physiological data on arrival was recorded and patients followed for clinically significant events until hospital discharge or death. Ethical approval for the study was granted by the Queens Medical Centre Ethics Committee reference G5040102.

Results: Seventy-two patients who had sustained abdominal trauma, six with penetrating injuries, were evaluated by FAST. The mean injury severity score of the patients was 14.75. Seven true positive scans were detected and confirmed by CT, DPL or laparotomy. One false negative scan occurred following an abdominal stab wound; haemoperitoneum being subsequently diagnosed at laparoscopy. One false positive scan was detected on reviewing the recorded images during the secondary survey. The sensitivity of the technique was 88% and specificity 98%, with an overall accuracy of 97%. The sensitivity of FAST was 100% in blunt trauma and 50% in penetrating trauma. Five scans were technically incomplete; in two pericardial views were not obtained, whilst in three surgical emphysema obscured views of the left upper quadrant. All scans were completed within 4 minutes.

Conclusions: Emergency torso ultrasound for the detection of haemoperitoneum can be successfully performed by trained non-radiologists in the UK. It is an accurate and rapid investigation, but should be used with caution in penetrating injury.

202 A RANDOMIZED CONTROLLED COMPARATIVE PILOT STUDY OF THE EFFICACY OF 1% PRILOCAINE AND 0.5% PRILOCAINE IN BIERS BLOCK MANIPULATIONS OF WRIST FRACTURES

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Introduction: With the withdrawal of 0.5% Prilocaine by Astra due to manufacturing reasons in 2000 the supply of the most commonly used drug for Biers block manipulation of wrist fractures in the Emergency department is drying up. Although 1% Prilocaine has been used in theatre settings for regional anaesthesia there is no study documenting the efficacy of 1% Prilocaine in the ED setting.

Method: 49 patients were randomly allocated to receive either 40mls of 0.5% Prilocaine or 20mls of 1% Prilocaine and 20mls of normal saline flush. The use of flush was designed to overcome the problem of reduced volume of drug in the 1% group. Sensation over the dorsum of the hand was tested from the time of instillation until the time of manipulation at ten minutes from the end of drug delivery. Pain scores prior to and during the procedure were documented as were the number of manipulations required. 24 patients received 0.5% Prilocaine 25 received 1% Prilocaine.

Results: Each group was statistically comparable at base line in terms of age, sex and pain score prior to the procedure. Time to dull sensation over the dorsum of the wrist was 2 minutes from the start of the procedure. During the procedure most of the patients experienced no pain at all with a mean change in pain score of -5 in the 0.5% group and -6 in the 1% group. There was a slight tendency for the 1% group to require a second manipulation (Fisher's exact test $p=0.14$). There were no complications in either group.

Conclusion: This study strongly suggests that 1% Prilocaine followed by 20mls of normal saline flush is as effective as 0.5% Prilocaine at producing suitable regional anaesthesia for wrist fractures in the ED setting. A further larger trial is recommended.

203 DEVELOPING A RISK ASSESSMENT TOOL TO IDENTIFY THE VULNERABLE OLDER PERSON IN A&E

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Introduction: Older people are waiting up to 1½ 1/2 hours longer to see a doctor in A&E, than younger people (ACHCEW 2001). Because of age-related changes, older people are more vulnerable to the effects of these waits and inadequate care can result in adverse outcomes including pressure sores, confusion and dehydration (Audit Commission 1995). The literature to date suggests that older people arriving in A&E have special needs that exceed their primary medical/surgical presenting problem (Meyer & Bridges 1998).

Methodology: A risk assessment tool was developed by an inter-professional expert panel of clinicians, with the aim of identifying the vulnerable older person upon presentation to A&E. A pilot study was conducted over 4 weeks. Nursing staff were asked to score vulnerability using the risk assessment tool. All patients over 75 attending

A&E were eligible for the risk assessment. Nursing staff also indicated whether or not they agreed with the score.

Results: 36 patients were assessed using the tool: High Risk = 19% (n=7), Medium Risk = 39% (n=14), Low Risk = 42% (n=15). Median time in A&E was significantly longer for High Risk patients than other patients ($p=0.005$ Mann-Whitney test). There was a trend towards correlation of higher risk score with longer waiting times (correlation coefficient 0.328).

Conclusion: This pilot study has highlighted the problem that older frailer people are waiting longer to be assessed in A&E than less vulnerable older individuals. It is possible to identify the vulnerable older person upon presentation to A&E using a risk assessment tool and further work is needed to validate this process which could be used to enhance the quality of care for older people with complex needs.

204 LOW IMPACT FRACTURES AND OSTEOPOROSIS

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Clinical Resource Efficiency Support Team (CREST) Guidelines issued in March 2001 state that 30–40% females and 15–20% of males will have one or more osteoporotic fractures in their lifetime.

A low impact / fragility fracture is defined as a fracture to wrist, hip, or vertebral body occurring either spontaneously, or as a result of a fall from standing height or less. The CREST guidelines state such a fracture is conclusive evidence of the risk of another fracture and is an indication for treatment of osteoporosis without the need for further investigation.

In light of this a prospective survey of patients attending an urban Emergency Department (ED) with low impact fractures was undertaken. Risk factors for osteoporosis, previous low impact fracture and current osteoporosis treatment were identified. A total of 48 patients were included from April-June 2001.

Agings ranged from 30–90 yrs (mean 66yrs). 83% (n=40) were female. 13% (n=6) had a previous diagnosis of osteoporosis, two of these patients were on no treatment. 20% (n=10) had a previous low impact fracture, none of these patients were on treatment for osteoporosis. 87% (n=42) had never been diagnosed with osteoporosis, of these patients, the fracture types were wrist 76% (n=31), vertebral body 12% (n=5) and hip 12% (n=5). 83% (n=40) patients had risk factors for osteoporosis 53% being post menopausal, the rest being steroid use, smoking, alcohol abuse, and anorexia. 84% (n=39) were on no treatment for osteoporosis.

The survey identifies that the vast majority of people presenting to the ED with low impact fractures are on no treatment despite risk factors for osteoporosis being present. According to the guidelines these patients should be treated without further investigation. This has resource implications for both Emergency Medicine and Primary Care.

205 SUSPECTED SCAPHOID FRACTURES: AN AUDIT OF THE USE OF BONE SCINTIGRAPHY IN DIAGNOSIS

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Background: Bone scintigraphy is proven to be effective in the diagnosis of suspected scaphoid fractures, as it is 100% specific. Therefore patients can be safely discharged from follow up if their bone scan is negative.

Aims: An audit of 213 patients with suspected scaphoid fracture was conducted. Comparison was made with a traditional management protocol against a strategy where earlier bone scanning was utilised to aid diagnosis.

Methodology: A retrospective study was conducted in which A&E notes were sourced from lists of patients having scaphoid x-ray. Information was stored regarding clinical findings, sequence of investigation and follow up arranged. 135 notes were traced from June and July 2001 during which time patients were managed with repeated follow up and x-rays. A new protocol was introduced which employed bone scintigraphy at the 1st return clinic (10–14 days) for symptomatic patients. The audit cycle was completed for December 2001 with a sample size of 78 patients, and comparisons were drawn.

Results: In December the number of bone scans requested had increased by 64.7% which resulted in a reduction in clinic appointments. Attendance at the second return clinic was reduced by 18.6% and the third clinic was reduced by 56.7%.

Conclusion: The use of bone scintigraphy is a safe and acceptable way to investigate suspected scaphoid fractures, and has been shown to reduce the number of follow up appointments in the accident and emergency setting.

Abstract 206 Initial ketamine dosage and need for subsequent doses

| Ketamine (initial dose) | 0.5mg/kg | 1mg/kg | 2mg/kg | Unrecorded |
|-------------------------------|------------|-----------|----------|------------|
| No. of patients | 61%(n=276) | 19%(n=88) | 7%(n=31) | 13%(n=58) |
| 2 nd dose required | 24%(n=67) | 14%(n=12) | 10%(n=3) | 19%(n=11) |
| 3 rd dose required | 1%(n=3) | 1%(n=1) | 3%(n=1) | 2%(n=1) |

206 PAEDIATRIC INTRAVENOUS KETAMINE SEDATION: A 10-YEAR EMERGENCY DEPARTMENT EXPERIENCE

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Ketamine is a dissociative anaesthetic, increasingly being used in the emergency department (ED) for procedural sedation. It is a particularly useful agent for brief, painful procedures in the paediatric population.

We present our 10-year experience in the use of intravenous (IV) ketamine in the ED of a District General Hospital – Craigavon Area Hospital. A protocol was established and data sheets regarding 453 ketamine procedures were prospectively collected between September 1990 and April 2000.

The average patient age was 6.9 years (median 6yrs). The indications for sedation were fracture reduction 61% (n=272), wound management 29% (n=131), foreign body removal 5% (n=21) and others 5% (n=21).

Ketamine was always administered in the presence of at least three staff trained in paediatric airway management. An initial IV dose of 0.5mg/kg was given in 61%(n=276), 1mg/kg in 19% (n=88), 2mg/kg in 7% (n=31) and in 13% (n=58) the dosage was unrecorded. Further IV ketamine doses were needed in some cases as shown in the table. IV atropine was co-administered routinely (0.01mg/kg range 0.1–0.4mg). IV midazolam was given in 81% (n=368) with a dose range of 0.2–20mg (mean 1.8mg). Recent evidence has shown midazolam confers no added benefit in reduction of emergence phenomena and it is no longer routinely administered with ketamine in this ED.

There were 2 incidences of laryngospasm both successfully managed with a short period of bag-valve-mask ventilation. There were no problematic emergence phenomena in this series (see table).

Ketamine is an effective ED agent for procedural sedation – used predominantly for children with fractures or wound management in this department. An initial IV dose of at least 1mg/kg appears to provide optimal sedation in this series.

207 ELECTRONIC PATIENT RECORDS, AN AMBULANCE SERVICE SOLUTION

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An Electronic Patient Report Form has been developed to replace hand written paper and is being piloted in conjunction with Blackpool Victoria Hospital Acute Trust.

The system enables ambulance staff to input patient information into a user-friendly handheld P.C. Demographic data will be pre-populated using the radio data system, already installed on all Lancashire vehicles. This transfer saves the crew time and enables them to concentrate on the clinical requirements of the patient. Once data is input, it is then transferred to the receiving hospital department using Smart Card technology. It can be printed onto paper or transferred into the Hospital Electronic Patient Record. The EPRF is returned by NHS Net to a data warehouse at ambulance control where it is stored electronically together with all the dispatch data.

All Lancashire Ambulances will eventually be equipped with this equipment. The system runs on hand-held solid state PC's and is designed with an easy to use on-screen display and data input. The device is rugged and durable. The system also allows software upgrades and development, and all data is encrypted and secure.

The unit is not simply be a data collection tool, it will also acts as an information resource for staff. Included on the unit will be an electronic clinical handbook enabling crews to access drugs working practices and protocols whilst on scene. In addition patient care pathways are built in to facilitate thrombolysis and trauma management.

The system enables accurate reporting, monitoring and audit of the 140,000 patient journeys annually. The benefits to the Trust in the

monitoring of Clinical Standards, measurement of Clinical Effectiveness and minimizing Clinical Risk are immense. Indeed, monitoring against NSF targets would be difficult without this electronic solution.

208 THE OUT-OF HOSPITAL EMERGENCY TEAMS. SITUATION IN SPAIN AND ANDALUSIA

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Even though the first Mobile Intensive Care Units were created in Belfast in 1966, it was not until the 90' s that out-of-hospital emergency teams became common in Spain.

The Spanish model of out-of-hospital emergency care is based on 3 aspects: Three figure telephone number, Co-ordination Centres, Out-of-Hospital physicians

Although Spain has a three-digit number for contacting the Emergency Co-ordination Centres (ECC) the number is not the same in all parts of Spain.

The Council of European Communities is implanting at the moment, in the whole of Spain, the number 112 which is the number hoped to be used in the future in all of Europe. This number integrates all emergency services (police, fire, civil protection, ECC etc.).

The most common model for out of hospital emergency care in Spain is that of the out of hospital physician. All models have a common characteristic that is the presence of a physician both in the ECC and in the Emergency Teams. Regarding the make up of the Emergency Teams (the personnel of an advanced life support (ALS) ambulance that attends emergency situations) there is no one format, although the most common is that of a 3-person team made up of physician specialised in emergencies, a Nurse specialised in emergencies, and an Emergency Medical Technician (EMT).

Andalusia is a region in the South of Spain with more than 8,000,000 citizens. It is divided in eight provinces. Looking now at the model in Andalusia; the Health Ministry of the Andalusian government created in 1994 the "Empresa Publica de Emergencias Sanitarias-EPES" (Public Service Company for Medical Emergencies), thus taking charge of setting up 061 emergency teams in the whole of the self-governing region of Andalusia. In some provinces this model coexists alongside some private medical emergency companies.

209 DELIBERATE TOXIC INGESTION IN CHILDREN AND ADOLESCENTS

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Introduction: The National Poisons Information Service (NPIS) Cardiff Centre receives telephone enquires from Wales and South West of England. The patterns of self-poisoning in adults have previously been published. We present data collated from enquiries to the NPIS (Cardiff) to assess how the pattern of deliberate toxic ingestion in children and adolescents compares.

Methods: Data was collected from the database at the NPIS (Cardiff) for all enquiries made from January 1994 to December 2000 for all those aged between 7 and 21 years. Information collected included age, sex, substance ingested and the circumstance of the ingestion.

Results: There were 27968 enquires to NPIS (Cardiff) during the study period concerning those aged 7 to 21 years. There has been a huge increase in the number of enquiries in this age group over recent years; there were 1472 in 1994 compared with 6169 in 2000. 67% (n=18735) of enquires concerned deliberate ingestions. 62% (n=11686) of these involved females. There were peak incidences at 15 and 20 years in girls compared to 18 and 20 years in boys. There were 18 deliberate ingestions recorded in 7 year olds and 26 in 8 year olds (see figure).

Analgesics were the most commonly ingested substance with 49% (n=9177) of episodes. Paracetamol was the most common drug

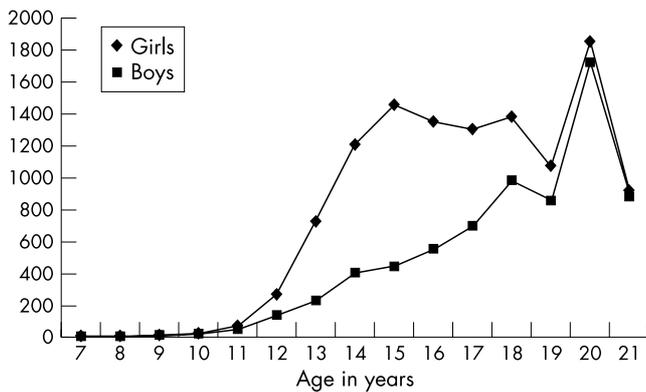


Figure 1 Number of enquiries to NPIS (Cardiff) for deliberate ingestions by age and sex 1994-2000 (abstract 209).

found. Antidepressants accounted for 17% (n=3181). These figures were similar to those found in a local study in 1992-3 looking at patterns of poisoning in patients aged 15 and over. Recreational drugs were the most commonly ingested agents in boys between 7 and 11 years.

Conclusions: Deliberate ingestion rates in children and adolescents, like adults, have increased over recent years. Worryingly this study has found a number of deliberate ingestions in the 7 and 8 year olds. Analgesics were the most commonly ingested substances. Recreational drugs are a particular concern in the younger boys.

210 AN AUDIT OF PRACTICE WITH IDENTIFICATION OF AREAS FOR IMPROVEMENT IN THE TREATMENT OF PATIENTS WITH A DIAGNOSIS OF POSSIBLE DEEP VEIN THROMBOSIS (DVT)

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Background: Patients presenting with a possible DVT are a common clinical problem in A&E. We have developed an evidence based investigation pathway for patients with a possible DVT, who are triaged to our clinical decisions unit (CDU). This paper describes this clinical pathway, investigation outcomes and identifies areas for improvement.

Methodology: Patients who present to A&E with possible DVT are triaged to our Clinical Decisions Unit (CDU). All patients have a pre test probability (PTP) estimated for DVT (using Wells criteria) and a D Dimer level (DD). Low PTP patients, with a normal DD are discharged home and seen in the clinic (in 7-10 days). Moderate PTP patients with a normal DD have an ultrasound scan (USS) before being discharged and are reviewed in clinic. High PTP patients with a normal DD and USS are considered for venography and reviewed in clinic if the imaging was non diagnostic. All patients had an USS if their DD was elevated.

Results: 239 patients were entered into the protocol. Of the 60 in the low PTP group 6 had a raised DD, but none had a positive USS for DVT. Of the 126 in the moderate PTP group, 38 had a raised DD of which only 21 had a confirmed DVT on USS. In the 53 patients in the high PTP group 33 had a raised DD, of which 20 had a proven DVT on USS. There were only 2 patients in the series with normal DD that were positive for DVT on USS (both in the high PTP group). Only 1 patient in the high PTP group needed a venogram and this was reported as normal.

Conclusion: Our CDU protocol for investigation of patients with possible DVT is valid and safe. 41 Patients in a series of 239 were diagnosed as having DVT and all patients were adequately followed up. Patients with a low PTP can be safely discharged if they have a normal DD without an USS. However all patients in the moderate to high groups need USS and should be reviewed if the initial tests are normal. Further work needs to be done to evaluate the consistency of inter-observer agreement when using Wells score for the PTP.

211 AN AUDIT OF PSYCHOSOCIAL ASSESSMENT OF PATIENTS WHO PRESENT TO THE EMERGENCY DEPARTMENT AFTER DELIBERATE SELF-HARM

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A quarter of all patients who commit suicide have attended hospital in the previous year with a non-fatal episode of deliberate self-harm

(DSH). For this reason it is important that patients who deliberately self-harm have a proper psychosocial assessment in the Emergency Department and appropriate intervention offered.

We analyzed the adequacy of documented psychosocial assessment of 100 consecutive DSH patients by Emergency Department staff. Some type of suicide risk assessment was recorded in 66% of cases; a full suicide risk assessment was recorded in 46%. A full psychosocial assessment should also include: 1. Presence or absence of a psychiatric history (recorded in 65%); 2. Presence or absence of previous self-harm: (54%); 3. Alcohol consumption: (51%); 4. Mental state examination: (35%).

This was comparable to an audit in 1996 in the same department of 404 episodes of DSH showing full suicide risk assessment in 72% of cases.

We introduced a DSH assessment proforma requiring doctors to record details and timing of the attempt, along with information on social history, alcohol consumption, previous psychiatric history and treatment and previous self-harm attempts. A modified SADPERSONS score (MSPS) was included to assist with suicide risk assessment.

Audit of a further 100 DSH case records showed marked improvement: full suicide risk assessment was recorded in 92%, presence or absence of psychiatric history in 85%, presence or absence of previous self harm in 80%, alcohol consumption in 75%, and a mental state examination in 80%.

We conclude that this simple measure improved assessment of DSH patients thus maximizing the opportunity for referral for appropriate intervention.

212 IMPROVING QUALITY IN THE DIAGNOSIS OF PULMONARY EMBOLISM ON A CLINICAL DECISION UNIT

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Objective: To evaluate the effectiveness of an evidence based strategy for the investigation of patients attending an Emergency Department with a symptom complex suggestive of pulmonary embolism (PE).

Methods: The Clinical Decision Units(CDU) in Leeds have a structured pathway for investigation of patients with symptoms and or signs suggestive of possible pulmonary embolism. Patients are initially stratified on clinical grounds and then go on to undergo further tests including a D-dimer assay, leg doppler ultrasound, nuclear scanning and/or spiral CT scanning depending upon their pre-test probability and a predetermined pathway.

Results: In the first year of the CDUs, 392 patients were evaluated for possible PE. 28 were defined as having a high clinical probability for PE of whom 7(25%) went onto be diagnosed as having had a PE. 134 patients had an intermediate pre-test probability for PE. Nineteen of these (14.2%) were diagnosed as having had a PE. Of the remaining 196 patients stratified as low clinical risk, 7 (4%) were diagnosed as having suffered pulmonary thromboembolism. Detailed data on the accuracy of each investigation pathway and outcome at 3 month follow up will be provided.

Conclusions: Pre-test risk stratification and appropriate use of advanced diagnostics can optimise the use of resources in the investigation of possible pulmonary thromboembolism. The quality of processing can be improved by managing the patients on a CDU.

213 THE PATIENT, THE NHS NATIONAL PLAN AND THE MENTAL HEALTH ACT: DELAYS IN EMERGENCY PSYCHIATRIC ADMISSION

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Introduction: The NHS National Plan calls for 75% of patients to complete their emergency episode within 4 hours this year, and 90% by next year. Currently, in London this is only achieved in 67% of patients. In nearly all acute hospital Trusts in England the psychiatry services are provided by a separate Trust, and, mental health assessments, as part of detaining patients the Mental Health Act (MHA) require the co-ordination of several agencies external to the Emergency Department.

Objective: This study aimed to identify delays in emergency psychiatric admission from the emergency department, especially with respect to the Mental Health Act.

Method: The study was done in a busy inner London Emergency department. Prospective data collection forms (demographic data and times from patient arrival to patient discharge) were filled out at the

time of the patient's attendance. Similar data was derived from the emergency department's computer system to identify psychiatric admissions over an eight month period, December 2000 to July 2001. Further information was collated from individual patient notes.

Results: 52, 815 patients were seen in the department, of which 3% were psychiatric patients. 18% of these were potential admissions. Two% of the psychiatric admissions were discharged within four hours of their arrival in the Emergency Department. The average time spent in the Emergency Department for MHA Section admissions was 22 hours (3.4–80 hours) and for voluntary admissions 7.5 hours (2–17 hours). The main delays were identified as waiting for the arrival of the duty psychiatrist 2 hours (0.5–6 hours) for a duty social worker, 6 hours (1–28 hours), bed identification, 2 hours (0–7 hours) and transport 3.75 hours (.75–5.4 hours).

Conclusion: The existing process contributes to performance well outside the targets of the NHS National Plan for patients presenting with psychiatric presentation to the Emergency Department. Collaborative work between the Emergency Department, Liaison Psychiatry and other relevant services is currently under way to reduce these delays.

214 DO RADIOGRAPHS OF CHILDREN DISCHARGED FROM A PAEDIATRIC EMERGENCY DEPARTMENT NEED REPORTING?

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Objectives: To ascertain (1) whether plain radiographs initially interpreted by doctors working in a paediatric Emergency Department should be reported by radiologists and (2) whether there are any identifiable risk factors for disagreement between the initial and final interpretations.

Methods: The study was a prospective observational study. All children discharged from the Emergency Department at Starship Children's Hospital in Auckland, and who underwent plain radiography during their stay, were included. Data were collected regarding the type of radiograph, seniority of interpreting doctor, confidence of interpretation, and provisional radiographic findings. Specialist paediatric radiologists subsequently reported all radiographs.

Results: A total of 973 episodes were included in the study. The overall disagreement rate was 26%. The clinically significant disagreement rate was 5%. There was no relationship between seniority of Emergency Department doctor, or confidence of initial interpretation, and likelihood of disagreement. Chest radiographs, then abdominal films, then skeletal films were more likely to result in disagreement ($p < 0.0001$). However this order was reversed when looking at the likelihood of a clinically significant disagreement ($p < 0.05$). The highest risk of disagreement was found in chest films initially thought to be normal (OR = 5.3) and the lowest in skeletal films initially thought to be abnormal. Some radiological appearances causing frequent disagreement were identified.

Conclusions: We demonstrated higher than expected rates of disagreement, when paediatric radiologists reported films initially viewed in our paediatric Emergency Department. Certain radiograph types and radiological appearances were associated with increased risk of disagreement. There has been almost no prospective research into this area within paediatric populations, and many of these findings have not previously been reported. Should this data prove generalisable, there are implications for radiological education in doctors working within Emergency Medicine, and implications for risk management.

215 SPECULUM EXAMINATION IN WOMEN <20 WEEKS GESTATION PRESENTING TO ACCIDENT AND EMERGENCY DEPARTMENTS WITH BLEEDING, IS IT NECESSARY?

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Background: Current literature provides little if any evidence to support the practice of both speculum and bimanual examination preceding USS in pregnant women with vaginal bleeding. Vaginal bleeding complicates 1 in 5 early pregnancies. Accident and Emergency Departments (A&E) often initiate management of these women. In the interest of best care it is important to identify the correct role of speculum examination in their management.

Objectives: We performed a study to assess to what extent each of the various clinical modalities significantly influenced the care

pathway. Specifically we looked at the role of the speculum examination in pregnant women (<20/40) presenting to A&E with vaginal bleeding. This represents the first stage in an approach to developing safe guidelines on clinical examination and investigations in A&E.

Method: A prospective study over a 4 month period included women presenting to A&E with vaginal bleeding at <20/40. Exclusion criteria were haemodynamic instability or known cervical carcinoma. The clinician documented a diagnosis and management plan on a standard questionnaire after bimanual examination and after subsequent speculum examination.

Results: 186 women were included in the study. Of these, a total of 4 (2%) had a change of management plan and 9 (4.8%) patients had a change of diagnosis after speculum. Contingency tables were constructed to show the significance of these findings.

Conclusion: The results suggest that speculum examination contributes to a small minority of management decisions. This finding is statistically significant and may be used to develop evidence based guidelines. The next stage is to identify which women benefit and to tailor clinical examinations accordingly.

216 KETAMINE: AN OBSERVATIONAL CASE SERIES EXAMINING EMERGENCY DEPARTMENT USE FOR SEDATION/ANALGESIA DURING URGENT PAINFUL PROCEDURES

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The use of ketamine for sedation/analgesia in the Emergency Department is gaining in popularity, particularly for paediatric sedation. Enthusiasm for the dissociative anaesthetic state in preference to the deep sedation often needed for urgent painful manipulations led to increased use of ketamine in children and adults in our department. 27 cases, illustrating a variety of serious conditions in which ketamine aided treatment, are presented (see table on next page): 7 children (4 male, 3 female) and 20 adults (11 male, 9 female; mean age 37, range 22–71). 14 adult patients initially received opiates. Initial ketamine IV bolus given was 0.5–0.7mg/kg. 4 cases involved multiple trauma. No serious complications were observed. Ketamine should be considered an ideal agent to aid urgent painful procedures, especially if the level of pain anticipated would otherwise necessitate deep sedation.

217 THE LANCASTER EXPERIENCE OF KETAMINE FOR PAEDIATRIC SEDATION. 500 CASES

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Ketamine sedation has become the technique of choice for paediatric sedation in the Accident and Emergency department. Lancaster has a unique experience of ketamine use with atropine and local anaesthesia, mainly to facilitate suturing of simple lacerations. The first 500 recorded cases are presented. The population characteristics, indications, side effects, and complications are discussed with reference to previously published reports. Parental and physician satisfaction make ketamine sedation the technique of choice. Low dose (2mg/kg intramuscular) may offer the same operating conditions as higher dose (2.5mg/kg intramuscular) with less incidence of side effects.

218 HOW TO DELIVER EFFECTIVE CLOSED CHEST COMPRESSIONS IN THE EMERGENCY DEPARTMENT

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Objective: This study was carried out to establish the length of time over which an individual can maintain effective chest compressions and the most effective pattern of rest and handover among a team. The continuing effectiveness of chest compressions was compared between groups of 2 or 3 rescuers performing chest compressions for 1, 2 or 3 minutes over scenarios lasting 18 minutes.

Method: Evaluation of the effectiveness of compressions was achieved using a computerised resuscitation manikin (Laerdal/ Skillmeter) on a hospital trolley. 21 volunteers competent in basic life support participated. The results were analysed using 1-way analysis of variance and Dunnett's contrast of the various scenarios.

Abstract 216

| Pat. no. | Age/sex | Weight (Kg) | Condition/treatment | Opiate (mg) | Ketamine (mg) | Adverse events |
|----------|---------|-------------|--|--------------------|-------------------------------------|--------------------------|
| 1 | 13 M | 55 | M/R/S # Tib-fib | Morphine 5 | 25 + 10 | Nil |
| 2 | 32 M | 85 | M/R/S trimalleolar #/disl. | Morphine 10 | 50 | Emergence euphoria |
| 3 | 42 M | 75 | M/R/S Tib-fib # - skin at risk | - | 50 + 10 + 10 | Nil |
| 4 | 17 M | 70 | Bilat pneumothorax, chest drains | Morphine 10 | 30 + 10 | Nil |
| 5 | 14 F | 60 | M/R/S Tib-fib# | Morphine 10 | 30 | Nil |
| 6 | 24 F | 65 | Ex-fix of pelvic fracture, M/R/S femur and bilat. Tib-fib #s | Diamorphine 7.5 | 50 + 10 | Nil |
| 7 | 31 M | 75 | M/R/S open humerus #, hand ischaemic | Morphine 10 | 30 + 20 + 10 | Nil |
| 8 | 28 F | 75 | M/R/S open wrist # - hand ischaemic | Morphine 10 | 40 | Nil |
| 9 | 31 M | 80 | M/R/S open and closed bilat. Tib-fib #s | - | 50 | Nil |
| 10 | 30 M | 80 | M/R/S open elbow #, hand traumatic amputation, C5&6 unstable fractures | - | 30 + 10/20mg boluses to 150mg total | Nil |
| 11 | 37 M | 105 | M/R/S open ankle # | Morphine 10 + 10 | 40 + 20 | Nil |
| 12 | 17 M | 75 | Exploration, toilet and suture of deep lacerations | Diamorphine 5 | 40 | Nil |
| 13 | 8 F | 24 | M/R/S supracondylar elbow # - skin at risk | - | 60mg IM | Nil |
| 14 | 32 M | 80 | M/R/S open and closed Colles #s | Morphine 10 + 10 | 30 + 20 + 10 + 10 | Nil |
| 15 | 6 F | 20 | Splintage femur # | - | 50 mg IM | Nil |
| 16 | 71 M | 65 | # ribs and pneumothorax. - chest drain | - | 30 | Nil |
| 17 | 54 F | 55 | Pneumothorax. - chest drain | - | 35 | Nil |
| 18 | 30 M | 110 | # femur shaft and intercondyles, # Tib-fib. M/R/S and log-roll | - | 50 + 20 + 20 + 20 + 20 | Nil |
| 19 | 34 F | 60 | Liver laceration. Transfer & CT scanning | Morphine 10 | 30 | Emergence fear |
| 20 | 40 F | 60 | M/R/S elbow #/disl. | Morphine 10 | 50 | Nil |
| 21 | 28 M | 75 | Pneumothorax - chest drain | - | 50 + 20 + 10 + 10 | Nil |
| 22 | 45 F | 75 | M/R/S trimalleolar #/disl. | - | 40 + 10 | Nil |
| 23 | 22 M | 80 | Inspect, xray, and splint crushed hand - open #s | - | 40 + 20 + 20 + 20 | Emergence disorientation |
| 24 | 14 M | 65 | M/R/S ankle #/disl. | - | 40 + 10 + 10 + 10 | Nil |
| 25 | 40 F | 55 | M/R/S, log-roll. Open tib-fib#, closed fib #. Clavicle #, elbow # (ie 4 limbs) | - | 30 + 10 + 10 | Nil |
| 26 | 47 F | 90 | M/R/S/Trimalleolar #/disl. | Fentanyl 0.1 + 0.1 | 50 + 20 + 20 + 10 | Nil |
| 27 | 45 F | 65 | M/R/S disl. Elbow and distal radius # | Morphine 10 | 40 + 20 | Nil |

KEY - M/R/S = manipulation, reduction, splintage. # = fracture. Disl. = dislocation. Weights estimated

Results: The results demonstrated that a 3 person team delivering 1 minute sets of chest compressions in rotation is significantly better than any other scenario at 5 minutes and beyond (p<0.0001). By 18 minutes 91.5% of all chest compressions delivered by this 3 person team were greater than 70% effective, there was no significant difference between the 1st and final set of chest compressions.

Conclusion: Continuous chest compressions can only be performed for 1 minute, preferably by 3 rescuers in rotation, to maintain a high level of effectiveness. Longer periods of chest compressions should be discouraged.

Abstract 219

| Time from arrival in A&E | Group A Chest pain within 12 hours of onset | Group B Chest pain > 12 hours since onset |
|--------------------------|---|---|
| 0 | ECG | ECG, Troponin I |
| 4 hours | ECG | |
| 8-12 hours | ECG, Troponin I | |

219 RAPID CHEST PAIN ASSESSMENT AND RISK STRATIFICATION IN A CLINICAL DECISION UNIT IN THE UK: EXPERIENCES OF THE FIRST YEAR

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Background: Rapid assessment protocols for exclusion of acute coronary syndromes are becoming recognised as an efficient and safe method for managing patients who present to A&E with undifferentiated chest pain. There is still a paucity of data to describe the experiences of these programmes in the UK.

Aims: To describe the protocol used to exclude acute coronary syndromes in patients admitted to the Clinical Decision Unit (CDU), at the Leeds General Infirmary with undifferentiated chest pain. To describe the first year's experience in the use of this protocol and the outcome for patients.

Methodology: The CDU chest pain protocol aims to rule out acute coronary syndromes in patients presenting with non-traumatic chest pain, who have either a normal or non diagnostic ECG. Patients are assessed as described in the table. Patients were discharged at least 12 hours after onset of their chest pain if a) there were no ECG changes, b) troponin I < 0.1 ng/l and c) no continuing symptoms. Other patients were admitted under the care of the physician or cardiologists.

Results: A total of 608 patients were assessed. The mean age was 52.6 years. There were 448 patients assessed via group A and 160 via group B. At the end of their assessment 68 patients (11%) were admitted to the hospital for further investigation and treatment. The rest

were discharged either to the care of their general practitioner or for cardiology out-patient assessment. Only one patient who had been discharged subsequently developed a myocardial infarction, but this patient had a troponin I of 0.1 exactly at discharge.

Conclusion: The chest pain assessment protocol at Leeds General Infirmary is a highly sensitive method of excluding acute coronary syndromes.

220 A BETTER DEAL FOR THE LESS UNWELL

Authors not supplied. Address not supplied

Introduction: In April 2001 after several months of planning, the Primary Care Suite (PCS) was opened at University Hospital Lewisham in London. The centre was opened for 12 hours a day and staffed by GPs and Emergency Nurse Practitioners (ENP's). A strict protocol was followed regarding who was suitable to be seen in the PCS, which focused on the care of patients who would normally be triaged as category 4 or 5 using the Manchester triage system (low category).

Method: Senior nurses and GP sessions had been removed from the main A&E department, and a lot of time was given to the ENP's by middle grade doctors to advise and assist them in the management of their patients. We studied the effects this had on the waiting times of patients who were triaged to higher categories to ensure that there was no detrimental effect, and also to measure whether there was a significant decrease in the waiting times for patients with triage category 4 or 5. We studied two periods of three months. The first before the PCS opened exactly a year before, and the second after the

PCS had opened. Using the ReMass computer system we were able to calculate the median waiting times for each triage category. We repeated the same analysis for patients attending during the opening times of the PCS and when it was closed.

Results: The results showed a significant decrease in waiting times for category 4 and 5 patients. These were more dramatic when the PCS was open and there was little change when it was closed. There was no change in the waiting times for patients of other categories.

Conclusion: We concluded from this work that the PCS had been a success. It had improved patient care to low triage category patients without any detrimental effects to other patients of a higher triage category with respect to waiting times. We feel that our study, which preceded the recommendations of the Ministry of Health, has helped us to focus on new ways to tackle increasing waiting times in a busy A&E department.

221 HOW DOCTORS SPEND THEIR TIME IN AN EMERGENCY DEPARTMENT?

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Study objective: To determine the various activities of a doctor in the Emergency Department and the time spent performing these activities.

Methods: An observational time and motion study was performed in a 16-bedded Emergency Department in a teaching hospital with 169 acute beds and annual patient attendances of 33,000. Participants were Senior House Officers in their first six months in emergency medicine. A single investigator followed each doctor for 180-minute periods and recorded time spent on various type and number of activities. Activities were categorised as Direct patient care (e.g. history and examination), Indirect patient care (e.g. charting), or Non-patient care (e.g. break time).

Results: On average, subjects spent 30% of their time on direct patient care, 51% on indirect patient care, and 10% on non-patient care. The activity on which the subjects spent most time, directly related to patient care, was history taking (mean 23.01 ± 10.71 minutes) whereas the activity which took up most time, indirectly related to patient care, was charting (28.25 ± 12.33 minutes). Non-patient care activities, which comprised 10% of total time, included waiting time (3.42 ± 2.01) and personal time (16.44 ± 14.16). In contrast to the four main activities directly related to patient care, there were up to twenty-nine different types of activities that indirectly related to patient care. The mean number of such activities (indirect patient care) over the observation period was 22 ± 3 .

Conclusion: In this study emergency doctors spent about half their time on indirect patient care and constantly performed a broad variety of activities indirectly related to patient care. This may limit the expected number of patients processed over a fixed period of time and has implications for staffing of Emergency Departments.

222 A RANDOMISED CONTROLLED TRIAL OF THE ONSET OF ANALGESIC EFFICACY OF DEXKETOPROFEN AND DICLOFENAC IN LOWER LIMB INJURY

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Objective: To assess the onset of analgesic efficacy of oral dexketoprofen compared with oral diclofenac in patients with acute lower limb injury.

Design: A prospective, randomised controlled trial.

Setting: An urban teaching hospital emergency department.

Interventions: Patients who fitted the study criteria were given either 25mg oral dexketoprofen trometamol or 50mg sodium diclofenac immediately after triage; baseline and 15 minute pain scores were then recorded for one hour.

Results: There were 122 patients enrolled in the study (diclofenac = 57 and dexketoprofen = 65). There were no significant differences in age, sex or type of injury between the two groups. In the whole study population the difference in pain scores between diclofenac and dexketoprofen at 0, 15, 30, 45 and 60 minutes were -0.02 (95% confidence interval -0.51 to 0.47), 0.53 (-0.03 to 1.09), 0.70 (0.16 to 1.24), 0.89 (0.32 to 1.47) and 0.83 (0.21 to 1.45). For those that completed the full sixty minutes of assessment (n=83) ANOVA revealed that there was a significant decrease in pain score at both 45 and 60 minutes (p=0.04 and 0.004 respectively).

Conclusions: Dexketoprofen trometamol is an effective rapidly acting analgesic for the treatment of soft tissue injuries. It appears to work faster and more effectively than diclofenac.

223 BETA-BLOCKADE OF ACUTE MYOCARDIAL INFARCTS IN THE EMERGENCY DEPARTMENT

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Introduction: Despite overwhelming evidence of the benefits of early beta-blockade in the treatment of acute myocardial infarction (AMI) in the pre-thrombolytic era, there remains controversy in their use today. The American College of Cardiology/American Heart Association Guidelines (1999 update) recommends the early use of beta-blockade in AMI regardless of reperfusion therapy. There is strong opinion, especially in the USA, that beta-blockade should constitute one of the first interventions in the treatment of AMI in the Emergency Department (ED). There appears to be widespread variation in practice, however, and many Emergency Physicians do not initiate early beta-blocker therapy.

Aim: To examine the early use of beta-blockers in the treatment of ST-elevation AMI in the ED of St Thomas' Hospital, a large teaching hospital in London.

Method: A retrospective study was carried out over a six month period looking at all patients with ST-elevation AMI. The notes were reviewed to determine whether beta-blockers had been administered in the ED and whether any contraindications existed to their use. The type of reperfusion therapy was also recorded.

Results: In total 42 AMIs were recorded. 11 of these patients received primary percutaneous coronary intervention. In the ED, 18 were thrombolysed and 11 received no reperfusion therapy. 2 sets of notes were missing. Of 21 patients eligible for beta-blockers only 1 received them. A further 17 patients had absolute contraindications to beta-blockade whilst 2 had only relative contraindications.

Conclusion: Despite strong opinion in favour of early beta-blocker treatment in AMI only 4.8% of eligible patients actually received it in the ED. The early use of beta-blockers should be considered in the treatment pathway for AMI in the ED or we risk denying a large body of eligible patients a potentially beneficial treatment.

224 EVALUATION OF AN INCREASED "STA-LIATEST" D-DIMER CONCENTRATION IN DETERMINING THE NEED FOR DOPPLER ULTRASONOGRAPHY IN THE DIAGNOSIS OF DEEP VEIN THROMBOSIS (DVT)

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Introduction: The clinical diagnosis of DVT is unreliable and the management of patients presenting to A&E departments with suspected DVT is problematic as urgent ultrasonography is not readily available. Currently this department uses a D-dimer concentration of $\geq 0.5\mu\text{g/ml}$ (in conjunction with clinical findings and risk factors) in assigning the need for ultrasonography in the diagnosis of DVT.

Objective: To evaluate increasing the current D-dimer value of $\geq 0.5\mu\text{g/ml}$ in assigning the need for ultrasonography in the diagnosis of DVT.

Design: A retrospective cohort study of patients attending our A&E department with suspected DVT.

Methods: Patients underwent D-dimer testing at triage and where indicated i.e. D-dimer $\geq 0.5\mu\text{g/ml}$ or strong clinical suspicion / risk factors, subsequent Doppler ultrasonography.

Results: 184 patients attending between 4/10/00 and 19/9/01 underwent D-dimer and ultrasonography testing for suspected DVT. Between D-dimer values of $\geq 0.5\mu\text{g/ml}$ and $\geq 0.8\mu\text{g/ml}$ the negative predictive value was maintained i.e. 90.5% and 91.7% respectively, without significant increase in the percentage of false negatives i.e. 1.1% at D-dimer $< 0.5\mu\text{g/ml}$ and 3.3% at D-dimer $< 0.8\mu\text{g/ml}$. By elevating the D-dimer value to $\geq 0.8\mu\text{g/ml}$ as assigning the need for ultrasonography would reduce the need for ultrasonography by some 30%.

Conclusions: In patients without strong clinical suspicion / risk factors for DVT the application of a D-dimer value of $\geq 0.8\mu\text{g/ml}$ for determining the need for ultrasonography has the potential for saving a large proportion of unnecessary ultrasounds without compromising the diagnosis of DVT. Thus a D-dimer value of $< 0.8\mu\text{g/ml}$ in the correct clinical setting can be used as the sole test to exclude DVT at the time of patient presentation.

225 THE WATERFORD PROGNOSTIC SCORING SYSTEM FOR SOFT TISSUE SPORTING INJURY TO THE KNEE JOINT: A PILOT STUDY

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Objective: To devise a scoring system for sporting injuries to the knee, which could be used by the Emergency Physician to identify those patients that would return to pre-injury sporting level within 8 weeks.

Methods: All knee injuries over a 3 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 8 weeks was gauged simply by return to competitive sport versus persisting morbidity.

Results: 39 knees were reviewed, 18 were "back to sport" within 8 weeks - mean score 6.38 (S.D.2.38), 21 remained "injured" - mean score 13.28 (S.D.2.88). The final score in these groups was 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 8 weeks versus persisting morbidity. The system can be used to reassure on the one hand, and on the other increase the import of early orthopaedic evaluation for the "injured" group.

226 THE EFFECT OF SPINAL IMMOBILISATION ON PULMONARY FUNCTION

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After trauma, protection of the cervical spine is a vital part of patient management. Advanced trauma life support (ATLS) requires continuous immobilisation of the entire patient with a semi-rigid neck collar, tape and straps. The aim of this study was to determine whether there is a significant difference in a patient's pulmonary function, while strapped to a spinal board, lying supine, compared to 30° reverse Trendelenberg tilt. Should these results effect the way we transport trauma victims.

Method: Twenty healthy non-smoking adults were studied, after informed consent had been obtained from each subject. Measurements included forced vital capacity (FVC) and forced expiratory volume in one second (FEV₁). We used the Microlab hand-held spirometer. Subjects were studied under 3 conditions. 1. Standing, with collar off. 2. Lying supine, with collar on and strapped to spinal board. 3. Lying at 30° reverse Trendelenberg tilt with collar on and strapped to spinal board. Three trials of pulmonary function were taken under each of the conditions listed above. Reproducibility of FVC was ensured because the best two of three spirograms for these parameters did not vary by more than 5%.

Results: We found that there is a significant difference (P<.0005) in FEV₁ and FVC, between conditions 1 and 2 (see table). This can be seen as a restrictive change on the spirograms. There was also a significant difference (p<.0005) between conditions 2 and 3. On questioning, all of the participants preferred to be strapped to the spinal board at 30° reverse Trendelenberg tilt.

Conclusion: We have therefore a) revalidated the fact, that the transport of trauma victims produces a marked restrictive defect in pulmonary function, and b) shown that by tilting the bed 30° reverse Trendelenberg, there is a statistically significant improvement in both FEV₁ and FVC compared to supine. Because victims of multiple trauma often have thoracic cage and proximal airway abnormalities, central hypoventilation caused by central nervous system trauma, and pulmonary shunting caused by lung contusions it would seem reasonable to suggest that such normotensive victims should be transported on a spinal board at a 30° reverse trendelenberg tilt.

227 ARE WE GETTING THE POINT? NEEDLESTICK INJURIES: AN ONGOING PROBLEM

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Background: Gloves worn in the Emergency Department provide protection against blood and body fluid borne infection. Patterns of glove perforation following hollow needle use is unknown and the incidence, using sensitive electronic testing has not been described.

Abstract 226

| | Standing | Supine | p value |
|---|-------------|-------------|---------|
| FEV | 3.56+/-0.48 | 2.70+/-0.45 | <0.0005 |
| FVC | 4.10+/-0.69 | 3.19+/-0.64 | <0.0005 |
| values shown as mean+/- standard deviation (litres) | | | |
| | Supine | Inclined | p value |
| FEV | 2.70+/-0.45 | 2.87+/-0.45 | <0.0005 |
| FVC | 3.19+/-0.64 | 3.45+/-0.66 | <0.0005 |

we used a paired, 2 tailed t test for comparison

Aims and Objectives: To identify the pattern and rate of glove perforation following hollow needle use in our Emergency Department.

Methods: Gloves used by staff handling hollow needles over a three month period were collected anonymously and placed in bins marked dominant and non-dominant. Gloves were then tested using the Electrical Conductance Test. If positive, the gloves were re-tested using the Water Load Test and perforations marked.

Results: Of 289 gloves collected, 145 were dominant, 144 non-dominant and 9.7%(28/289) were perforated, compared to 1/100 control gloves (p<0.01 Fisher exact probability). Ten perforations (6.9%) were noted in the dominant gloves and 18(12.5%) in the non-dominant gloves (p=0.1 Chi-squared test). No staff reported needlesticks during the study. Most perforations occurred on the thumb and index fingers.

Conclusion: Risk of acquiring HIV through needlestick and parenteral exposures is 0.32%. Despite manufacturers' flaw rate of 1.5% and a perforation rate of 3% on donning gloves we believe a perforation rate of 9.7% is unacceptably high. As pits in Latex may admit viruses, and be undetectable to the Water Load Test (industry standard), we recommend the routine use of the Electrical Conductance Test in glove testing. Only 289 gloves collected during this period, when 12,000 patients were treated, suggests poor compliance with glove use. As gloves have a protective effect during needlestick injury we recommend the routine use of gloves with all procedures and double gloving for high-risk procedures. This study emphasizes the need for practice of universal precautions, ongoing education and active reporting of all needlestick injuries.

228 SUTURING SKILLS IN EMERGENCY MEDICINE RECRUITS

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Background: Wound suturing is an integral part of training and daily workload in Emergency Medicine.

Aims and Objectives: To evaluate competence in suturing in Senior House Officers entering training in Emergency Medicine.

Methods: Thirty-six trainees were assessed placing two sutures in simulated wounds in artificial skin using 4/0 Nylon and Latex gloves. Data collected included; position of needle in needleholder, angle of entry of needle to skin, handling of suture needle, safety and security of knot formed. Gloves were assessed for perforation using an electrical conduction test.

Results: Of 72 Emergency Medicine SHO's in N.Ireland, 36 attended regional induction. Ten gloves were perforated (28%) by nine doctors. Seventeen (47%) doctors had an acceptable needle holding position, 25 (69%) showed correct angle of entry of the needle to skin and 12 (33%) produced a safe and secure knot. Eighty nine percent (32) of SHO's handled the suture needle.

Conclusion: SHO's entering Emergency Medicine training have poor suturing skills and a high glove perforation rate. This suggests serious health implications for both patients and doctors.

229 THE IMPACT OF A SUTURE WORKSHOP IN AN EMERGENCY DEPARTMENT

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Background: Needle handling during suturing has been connected with glove perforation and possible transmission of blood borne pathogens. The No Touch Technique (NTT) as taught on the Basic Surgical Skills course attempts to eliminate needle handling.

Aims and Objectives: The aim of this study was to assess the impact of introducing the NTT into an inner city emergency department (ED). The rate of glove perforation following suturing was measured as a marker.

Methods: Gloves (Bodyguards) used in suturing were collected over a 3 month period. Following this a 1-day NTT suture workshop was conducted in the ED and gloves were collected for a further 3 months. All doctors (14) were included in this study regardless of grade. All gloves were tested for perforation with the electrical conductance test. One hundred unused gloves were tested as controls.

Results: Two hundred and forty gloves were collected. One hundred and seven in the pre NTT group and 133 in the post NTT group. A perforation rate of 19/107 occurred in the pre NTT group and 28/133 in the post NTT group. Chi squared testing revealed no significant difference ($p > 1$) between the two groups. Control demonstrated a perforation in 1 of the 100 tested.

Conclusion: A single day suturing workshop is insufficient in reducing the glove perforation rate following suturing in the ED. More time should be dedicated to training doctors in the skills required for safe suturing. Additionally we believe that doctors' perceived low risk of needle stick injury may inhibit the desire to improve suturing skills.

230 THE INFLUENCE OF THE BASIC SURGICAL SKILLS COURSE ON NEEDLESTICK INJURIES

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Aims: assess the impact of the basic surgical skills course on glove perforation during simple suturing.

Methods: The study was conducted at a regional BSS course. Fifteen senior house officers attended. All participants were asked to place two simple sutures (Ethilon) in artificial skin whilst wearing surgical gloves (Bodyguard). After completion of this task the gloves used were collected in bins marked dominant and non-dominant hand. Any perceived needlestick injuries were documented. Each participant performed this task three times. On the final day of the course the simple suturing exercise was repeated three times and all gloves collected. Ninety gloves were tested after wearing and performing no task as control. All gloves were tested electronically for perforations.

Results: Pre-course the perforation rate was 4.4%(2/45) in the dominant hand, 11.1%(5/45) in the non-dominant hand and 7.8%(7/90) overall. Post-course the perforation rate was 0%(0/45) in the dominant hand, 2.2%(1/45) in the non-dominant hand and 1.1%(1/90) overall. No needlestick injuries were reported during the study. Control perforation rate was 1.1%(1/90).

Conclusion: The BSS course significantly reduces ($p=0.032$) the glove perforation rate whilst suturing. We conclude that the BSS course improves sharps awareness and feel formal teaching should be encouraged in other specialities where suturing occurs.

231 CARBON MONOXIDE POISONING: THE OTHER SILENT KILLER

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The use of end-tidal breath carbon monoxide as a screening tool in suspected carbon monoxide poisoning.

Introduction: Carbon-monoxide is a toxic, colourless, odourless and tasteless gas. Its toxicity can result in fatality and neurotoxic sequelae. Its non-specific manifestation results in underdiagnosis without a high index of clinical suspicion. The availability of a cheap, painless, validated screening tool provides the clinician an additional diagnostic modality.

Study: This six month study was undertaken to determine the utility of breath end-tidal carbon-monoxide (ETCO) as a screening tool in suspected carbon-monoxide poisoning.

Method: Patients clinically suspected by the accident and emergency examining doctor to have symptoms suggestive of carbon-monoxide poisoning were screened with the Bedford EC50ToxCO end-tidal expired air carbon monoxide monitor. Those screened had an audit sheet filled.

Results: Fifty-three patients were screened. Twenty-nine had normal ($< 1\%$ ETCO) levels and were discharged. The commonest reasons for screening this group were unexplained nausea/vomiting (37.9%), suspected smoke inhalation (34.5%), headache (27.5%) and dizziness/vertigo (27.5%). Ten patients (all smokers) had ETCO levels greater

Abstract 231

| Age | Symptom | Reason to screen | Blood CO | Breath ETCO |
|-----|-----------|------------------|----------|-------------|
| 4 | Syncopy | Symptom | | 23.5% |
| 5 | dizziness | Symptom | | 27.5% |
| 9 | dizziness | Symptom | | 19.4% |
| 36 | None | Child ill | 15% | 9.3% |
| 43 | None | Child ill | 14.8% | 9.3% |
| 44 | None | Child ill | 11.3% | 7.4% |
| 45 | Headache | Symptom | 16.2% | 13.1% |

than 1% but less than 5%. Seven patients with ETCO levels greater than 5% including three children needed further management (table).

Discussion: Death from carbon monoxide poisoning claims around 1800 lives each year in the United Kingdom. Its clinical under-diagnosis remains a problem that needs easily applicable convenient diagnostic tools. The end-tidal carbon monoxide monitor is one such tool. Its convenient, inexpensive, painless ease of use facilitates measurements in mass casualty situations and in children who can be spared painful blood sampling.

Conclusion: The end-tidal carbon monoxide monitor was shown to be a useful adjunct in the diagnosis and management of suspected carbon monoxide poisoning

232 SURVEY OF EMERGENCY DEPARTMENTS PREPAREDNESS FOR TERRORIST ATTACKS

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Introduction: Terrorism has threatened civil population of developed countries with the use of weapons of mass destruction (WMD). Since September 11, 2001, most of emergency physicians have asked themselves if their Emergency Department (ED) has properly prepared to deal with a large-scale terrorism act.

Material and Methods: We have surveyed all EDs of Catalonia - a European region with most than 6,000,000 of people - to know the level of preparedness to deal with terrorism acts using WMD. Questionnaire focused on hospital characteristics, ED activity, equipment, resources and organisation, as well as respondent skills, opinions and perception regarding the level of ED preparedness.

Results: Fifty-nine of 79 EDs (75%) responded. Hospitals had written plans for multiple casualties disasters in 29%, for biological incidents in 24% and for chemical incidents in 7%. Any ED physician had been participated in courses regarding those kinds of incidents in 59%, 15% and 25% respectively. Less than 25% of responders considered themselves with enough information to face a terrorist attack, and less than 10% considered their ED as fully prepared. Forty-eight percent of ED had a permanent operating room, 24% garments to protect personnel from chemical/biological agents, 7% decontamination systems for patients, and 21% antidotes for the most probably used biological weapons. Only 10% considered that their ED would be able to manage 20 or more casualties at a time. In whole, higher levels of preparedness correlated with the amount of ED activity rather than hospital location or size.

Conclusions: We found that, nowadays, our EDs are not prepared for a terrorist incident with WMD because of limited resources and equipment, low organisation level and lack of experience and skills. Health authorities should promote a better ED facilities preparedness for facing hypothetical large-scale terrorist incidents, and emergency physicians should urgently update their knowledge and skills to face up to terrorist event with WMD.

233 VALIDATION OF A PAEDIATRIC PAIN ASSESSMENT TOOL DESIGNED FOR USE IN THE ACCIDENT AND EMERGENCY DEPARTMENT

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Objective: There are multiple pain assessment tools in use but not validated in the context of an A&E environment, where the atmosphere is tense and the child is using such tools for the first time. The tool we

Abstract 233

| Phase 1 | | | | Phase 2 | | | |
|---------|------|-----|--------|---------|------|-----|--------|
| Nurse 1 | | | | Nurse 1 | | | |
| None | Mild | Mod | Severe | None | Mild | Mod | Severe |
| None | 6 | 2 | | None | 3 | | |
| Mild | 1 | 16 | 7 | Mild | 7 | | |
| Mod | | 3 | 8 | Mod | 2 | 6 | |
| Severe | | | 2 | Severe | | | 1 |

propose comprises both objective self-reporting and subjective observations of behaviour and injury severity. The pain tool comprises a mixture of smiley faces, numerical and behavioural scales. Our aim was to determine the inter-observer reliability of this tool when used in the Accident and Emergency department.

Method: We included all children attending the department complaining of pain. Sickle cell children were excluded as they go through a separate assessment process. We validated the pain tool in two phases. In Phase 1 the two nurses assessed the child and completed the pain score consecutively and blind to each other. In Phase 2, Nurse 1 questioned the child while Nurse 2 observed. Both filled in a pain score independently. The two phases were trialed over a total period of five weeks.

Outcome measures: Each nurse graded the overall score as 'none', 'mild', 'moderate' or 'severe'. The pain score for each child was recorded and the degree of correlation between the two observers was calculated.

Results: The results are shown in the table.

The Kappa value for Phase 1 was 0.44 (95% CI 0.25 – 0.63) signifying moderate agreement. The Kappa value for Phase 2 was 0.79 (95% CI 0.44 – 1.15) signifying very good agreement.

Conclusion: We have developed a pain tool specifically for use by children in the Accident and Emergency department and have shown high inter-observer agreement. This tool has been proposed for use in the forthcoming 'BAEM Guidelines for Analgesia in Children in A&E Departments.

234 MULTI-AGENCY STRATEGIES TO TACKLE VIOLENCE IN A LARGE INNER CITY EMERGENCY DEPARTMENT

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Violence and threats of violence are an increasing problem in Emergency Departments in the UK. The government has backed a campaign of Zero Tolerance. More than one strategy is needed to tackle this problem. Over the past 2 years the Department at QMC has worked closely within the hospital community and with Outside agencies to develop multiple strategies to tackle this problem.

Queen's Medical Centre is a large teaching hospital department seeing 124,000 new patients per annum. There is a well-established system of recording and pursuing acts of aggression, violence and harassment (AVH). Over a period of 7 months. In 2001 there were 177 documented cases of AVH (Representing approximately 0.2% of all attendees) Of these 29 involved actual violence, 42 threats of physical violence and 106 episodes of verbal abuse. 41 people were arrested, or had police involvement, and a total of 85 solicitors letters were sent out to patients or their relatives.

Amongst other strategies employed are: -

- 1 Security Liaison Group meetings – regular meetings between A&E staff, security, Health and Safety and the local police
- 2 Court Injunctions in cases of serious continued violence
- 3 Anti-Social Behaviour orders instituted by the Magistrates Court against people when all other avenues have failed, setting limits on behaviour.
- 4 Staff training in de-escalation and escape techniques
- 5 Adequate reporting/police statements for all incidents of AVH
- 6 Raising awareness of previous episodes of AVH so that staff are not put at risk
- 7 Personal attack alarms and 24 hour security presence

To tackle violence in Emergency Departments it is vital to adopt a multi agency response, and understand clearly the avenues available,

to tackle the high levels of violence against Staff in Emergency Departments. The presentation will include local experiences of legal applications.

235 ARE WE OVER-TRIAGING?

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Objectives: Triage is a tool to ensure patients are seen in order of clinical need. Increasingly it is being used as a performance indicator and to compare case-mix within between departments. This study looked retrospectively at the accuracy of triage performed by experienced staff nurses according to the national triage scale and compared this to the opinion of 2 consultants in emergency medicine.

Methods: The charts of 50 consecutive patients in triage categories 1, 2 and 3 were checked by a Emergency Nurse Practitioner and Specialist Registrar in Emergency Medicine, according to the National Triage Scale. Two Consultants in Emergency medicine were blinded as to the original triage category and asked to triage the patient looking at all the clinical information available.

Results: The accuracy of triage was better in the higher categories. Priority 3 patients tended to be "over-triaged". Kappa statistic for priority 1 and 2 was 0.77 and 0.68 respectively. Again there was good concurrence by the consultants with the priority 1 and 2 patients, varying more in priority 3.

Conclusions: We were concerned that we were not able to meet waiting times for some categories of patient because we were putting them in a higher category than they should have been. This proved not to be the case.

236 PARACETAMOL PACK SIZE LIMITS: THE LAST WORD ON THEIR EFFECT

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Introduction: Paracetamol is the drug most commonly ingested in overdose in the UK and accounts for about 40% of toxic ingestions presenting to hospital. In late 1997, the Health Secretary announced a measure to reduce deaths from suicidal toxic ingestion. Over-the-counter sales of Paracetamol were to be limited. No more than two packs of maximum 16 tablets were to be available at one transaction. We assessed the effect of the new regulations on presentations to the Welsh Poisons Unit (total admissions 1623 in 1998; 1853 in 1999).

Methods: Data was collected on patients admitted to the Poisons Unit between 1st September 1997 and 31st December 1999. Information was extracted from the patients' notes and later collated and stored electronically.

Results: 1532 patients had a diagnosis of toxic ingestion of Paracetamol-containing tablet or NSAID. Monthly numbers presenting to the Unit (fig.2) did not fall over the course of the study. 861 cases were Paracetamol (males 358; females 503). Average numbers of tablets taken in each Paracetamol ingestion remained relatively unchanged (see figures).

Conclusions: The change in the law limiting the availability of Paracetamol for over the counter sales made no difference either to numbers of patients presenting to the Poisons Unit over a 27-month

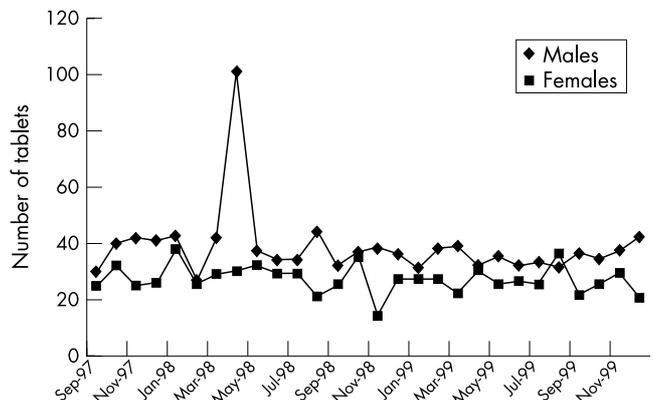


Figure 1 Average numbers of tablets taken per admission for a toxic ingestion by gender (abstract 236).

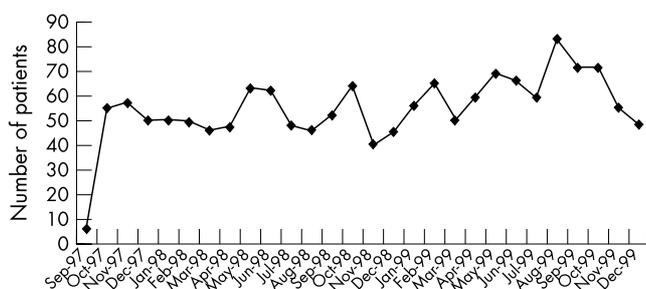


Figure 2 Paracetamol and NSAID admissions to the Poisons unit by month (abstract 236).

period encompassing the introduction of the law. Average numbers of tablets taken in each presentation was also unchanged.

237 MANAGEMENT OF RIB FRACTURES IN THE EMERGENCY DEPARTMENT

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Introduction: Rib fractures indicate severity of blunt chest trauma and occur in 4%-10% of all injured patients. Rib fractures, particularly in elderly patients, constitutes a major challenge since their presentations and outcome differ from the adult population in addition to their high morbidity and mortality.

Objectives: To assess the management of rib fractures in the Emergency Department.

Study design: Retrospective review of patients with rib fractures over a period of 6 months.

Methods: All the patients coded as 'closed fracture chest' and 'multiple trauma' were identified through the computer database and case records examined in detail.

Results: One hundred and two patients were analysed. Of those 28 patients were over 60 years and 74 patients were less than 60 years of age. The management of these patients were summarised in the table.

Conclusions: Patients with rib fractures, particularly elderly patients, were not treated with adequate and effective analgesia even though they had higher incidence of rib fractures (particularly multiple rib fractures) and complications. Appropriate measures need to be put in place to identify high-risk patients with rib fractures in the Emergency Department and adopt a lead role in co-ordinating the multi-disciplinary teams in the management of these patients.

238 REDUCING THE NUMBER OF REPEAT VISITS BY RECURRENT ATTENDEES TO AN EMERGENCY DEPARTMENT WITH A WRITTEN OFFER TO MEET A DOCTOR AND NURSE FROM THE DEPARTMENT

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Aim: To reduce the number of visits by recurrent attendees to an emergency department by offering and arranging a meeting with a doctor and nurse from the department.

Methods: Patients with recurrent attendances over the preceding year were identified from the computer records. Children under the age of sixteen were not included. Patients who had recurrently attended but who had also been admitted were excluded. The fifty

patients with the highest number of attendances were simultaneously sent a letter offering to meet with the first author and one of the departments senior nurses. The patients GPs were also informed of this process and were asked to contact us if they perceived any problems or an increase in visits by the patients to their surgeries.

The letter identified them as a recurrent attendee in the top fifty and offered a discussion of the patients attendances, the availability and appropriateness of different NHS services and offered them the opportunity to discuss their needs. Patients were told that they could bring one other person to the discussion with them as desired. When requested, a structured interview was arranged using the format described in the letter. Further medical intervention was organised if considered necessary at the meeting.

Results: Fifty patients were identified with a combined total of 432 attendances between them over the preceding year. 65% of these attendances had been via by an emergency ambulance. Of these patients, 12 (24%) replied to the letter and 4 (8%) requested and attended an interview. Over the following three months the number of attendances in this group of patients was predicted to be 108 but was found to be 73 - a reduction of 32.4%. Further subgroup analysis was not possible given the small numbers.

Discussion: In the short term this simple strategy has led to a sizeable reduction in the number of attendances in this group of patients. This has benefited the department in terms of saving time and expenses and has also reduced the emergency ambulance workload. Such a strategy should be widely applicable.

239 DO RESUSCITATION ATTEMPTS IN CHILDREN WHO DIE, CAUSE INJURY?

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Objective: To determine the incidence, type and pattern of injury related to resuscitation attempts in children who die.

Design: Retrospective review of ambulance, hospital and autopsy case records.

Method: All children who died aged 0-14 years between 1994 and 1996, and underwent a full autopsy at the Victorian Institute of Forensic Medicine were identified. Children who were subject to recognised trauma before resuscitation or died because of a congenital abnormality were excluded. The records of all remaining children were reviewed. Children were grouped according to whether resuscitation was attempted or not.

Results: From a total of 346 children who died, 204 (58.6%) were identified as meeting the inclusion criteria. Resuscitation was performed in 153 (75%) children and was commenced prior to ambulance arrival in 123 (60.3%) children. Injuries were detected at autopsy in 65 (42.5%) of children who had resuscitation compared with 6 (11.7%) of children who had no resuscitation ($p < 0.0001$) χ^2 . All but two of these injuries were of a minor nature consisting principally of bruises or abrasions. Two significant injuries were identified both occurring as a result of readily identifiable resuscitation procedures. The likelihood of injury increased with the length of resuscitation. In children resuscitated for less than 60 minutes the incidence of injury was 27% compared with 62% for children resuscitated for longer. ($p < 0.0001$)

Conclusions: In children who die, minor injuries such as bruises and abrasions that may be attributed to resuscitation, are common. Serious injury however is extremely rare. Resuscitation in children is therefore a safe practice. Where an unexplained serious injury is detected following resuscitation it is unlikely to have been caused by resuscitation and other causes such as non-accidental injury should be considered.

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| No: | Management in Emergency Dept | Age <60 years (n=74) (% in brackets) | Age >60 years (n=28) (% in brackets) |
|-----|--|---|---|
| 1 | Falls as mechanism of injury | 40 (54%) | 21 (75%) |
| 2 | Seen by Senior House Officers | 48 (65%) | 22 (79%) |
| 3 | X-rays of the chest performed | 52 (70%) | 24 (86%) |
| 4 | Number of patients with rib fractures | 18 (12%) | 18 (64%) |
| 5 | Patients with multiple rib fractures | 9 (12%) | 5 (18%) |
| 6 | Patients NOT treated with analgesia | 4 (5%) | 9 (28%) |
| 7 | Complications | 0 (0%) | 3 (11%) |

240 BEDSIDE CARDIAC MARKER TESTING AS A TOOL IN RISK ASSESSMENT FOR ACUTE CORONARY SYNDROMES IN THE EMERGENCY DEPARTMENT

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Objectives: Patients with suspected acute coronary syndromes (ACS), and non-diagnostic initial electrocardiograms (ECG), pose a diagnostic dilemma in the emergency department (ED). We assessed how the number of major risk factors, patient perception (PP), doctor's perception (DP), point of care testing of cardiac markers (POCT), and quantitative laboratory testing of cardiac markers (LAB) performed as predictors of final diagnosis in such patients in the first 7 hours after chest pain. The introduction of a diagnostic algorithm using POCT into the ED was also assessed.

Methods: Questionnaires were completed, and the biochemical markers troponin-I, CK-MB and myoglobin assayed on arrival and at 7 hours, on 35 patients with suspected ACS and a non-diagnostic initial ECG. Retrospective analysis of clinical notes gave final diagnoses of ACS (n=5), non-ACS (n=25) and unknown (n=4), with 1 exclusion. Sensitivities, specificities and positive and negative predictive values (PPV, NPV) were calculated on those with definite final diagnosis.

Results: PP and DP were sensitive (100%) but poor predictors of diagnosis (specificities 11; and 23%; respectively). Cardiac marker testing by POCT and LAB had high specificity levels (range 88 – 100%). LAB testing of troponin-I at 7 hours had the highest sensitivity of any individual marker (100%). LAB testing of combined markers was highly sensitive (100%) but less specific (82%), whereas POCT was specific (90%) with low sensitivity (60%). The sensitivity for admitting ACS patients using a diagnostic algorithm incorporating POCT was 100%, with a specificity of 52%.

Conclusions: Risk stratification of patients with chest pain using risk factors, history and ECG changes can be enhanced by additional use of early cardiac enzyme testing. POCT proved to be an effective "rule-in" test, though there may be benefit in using a laboratory assay when screening chest pain patients in the ED, when high sensitivity levels are desired.

241 A PRACTICAL EVALUATION IN THE USE OF STRAIN GAUGE PLETHYSMOGRAPHY AND DIGITAL PHOTOPLETHYSMOGRAPHY IN THE DIAGNOSIS OF DEEP VEIN THROMBOSIS

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Aim: To Highlight the practical differences between two different methods of Plethysmography

Methods: A prospective study comparing Strain Gauge Plethysmography (Venometer) and Digital PhotoPlethysmography (D-PPG) in patients presenting with suspected DVT. Patients were clinically assessed and a note of their risk stratification made before having Venometry, Venometry and D-PPG, and D-PPG respectively. The time taken and the ease of use of each method was documented on a Pro-forma by the staff. All patients were contacted after discharge to determine if they had found either investigation problematic.

Results: A total of forty-six patients (19 male and 27 female) were recruited. Seventeen had Venometry and eight had D-PPG only, twenty-one had both procedures. The mean age of the patients was 52 years. On average it took nine minutes (3–30minutes) to perform D-PPG compared with 15 minutes (8–20 minutes) for Venometry. In

Abstract 242

| | Strain Gauge Plethysmography (52) NPV=95% | D-Dimer + Strain Gauge Plethysmography (40) NPV=92% |
|--------------------------------|---|---|
| High Risk 20% +ve DVT | | |
| Total number | (6) | (4) |
| Sensitivity | 50% | 100% |
| Specificity | 50% | 0% |
| Negative Predictive Value | 60% | 0% |
| Medium Risk 13% +ve DVT | | |
| Total number | (10) | (28) |
| Sensitivity | 75% | 50% |
| Specificity | 66% | 83% |
| Negative Predictive Value | 80% | 90% |
| Low Risk 4.5% +ve DVT | | |
| Total number | (36) | (8) |
| Sensitivity | 0% | 100% |
| Specificity | 88% | 00% |
| Negative Predictive Value | 100% | 100% |

the 21 patients in which both D-PPG and Venometry was performed, three (14%) were assessed as being in high-risk group, 10(47%) and 8(38%) were in the medium and low risk groups respectively (see table). Of those who had a D-PPG 27(93%) found it tolerable compared to 36(94.5%) of the patients who had Venometry. One (3.5%) of the D-PPG patients found the test uncomfortable.

Conclusion: This pilot study has shown that D-PPG is quicker to perform and has a higher negative predictive value in ruling out DVTs. However It can be uncomfortable to perform in a minority of patients.

242 WHAT ROLE DOES RISK ASSESSMENT HAVE IN THE A&E SCREENING OF DVT

S.K.Shubber, L.Thai Lim, H.Sayers, L.Rocke. *The Department of Accident & Emergency Medicine, The Royal Victoria Hospital, Belfast, Northern Ireland*

Aim: To Highlight the importance of risk assessment in patients with suspected DVT.

Methods: A Prospective study using an algorithmic approach to patients attending the A&E department with Deep Vein Thrombosis. The patients were clinical assessed and given a score accordingly using Well's classification and placed into three risk groups High, Medium and Low risk groups respectively. The Patients were then screened for DVT using the D-Dimer test and the Strain Gauge Plethysmography (Venometer) on one hand and the Strain Gauge Plethysmography (Venometry) on the other. A D-Dimer result of 500 or more considered being positive.

Results: A total of 92 (29 male and 63 female) were recruited, 40(13 male and 27 female) had Venometry and D-Dimer, and 52(16 male and 36 female) had Venometry only. The mean age of all the patients was 56 years. There were no DVTs diagnosed in patients who according to the modified Well's classification were low risk and screened negative to both D-Dimer and Venometry or Venometry alone (see table).

Conclusion: DVT Screening Tools should used in conjunction with good clinical assessment using a modified Wells as part of an algorithmic approach. All patients who are medium or high risk should have Ultrasound or Venography.

243 DEVELOPING THE ROLE OF EMERGENCY MEDICINE ULTRASONOGRAPHY IN THE UK. THE LEEDS EXPERIENCE

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Structure: Since 1998 we have been developing a structured programme to introduce ultrasonography into emergency medicine clinical practice in our department. This paper describes the process and the quality assurance programme that has been developed.

Process: Existing programmes vary from a minimum of 1-hour didactic teaching and 1 hour practical experience to a maximum of more than 500 supervised examinations. We initially started with

Abstract 241

| | Digital PhotoPlethysmography | Strain Gauge Plethysmography |
|--------------------|------------------------------|------------------------------|
| DVT N=3 | | |
| True Positive | 3 | 2 |
| Sensitivity | 100% | 66% |
| False Negative | 0 | 1 |
| No DVT N=18 | | |
| True Negative | 11 | 14 |
| Specificity | 61% | 77% |
| False Positive | 7 | 4 |

FAST (focused assessment with sonography in trauma) and used a combination of didactic teaching and supervised practice.

Output: Nineteen emergency physicians were trained in the use of FAST and had entered patients into the study. Over 17 months 133 patients were studied. Compared to the 'gold standard' (of subsequent CT, laparotomy, post mortem or observation) the presence or absence of free fluid was correct in all but one case. On review of videoed scans by an expert sonographer no gross errors were detected.

Further developments: Having shown that after a brief training program, emergency physicians could perform FAST to rule in significant intra-abdominal injury, and that FAST scanning ability was retained well, we developed further training in the following areas; the assessment of the abdominal aorta, assessment for foreign bodies/abscesses and gaining vascular access. Each of these four areas is subject to on-going observational study and every assessment is recorded as part of a quality assurance programme.

Conclusion: Focused ultrasonography skills can be taught to and retained by emergency physicians in the UK. Further evaluation and the ongoing quality assurance programme will quantify the level of benefit to patient care.

244 E-TARN: EUROPEAN TRAUMA DATABASE

M.N. Smith. *Address not supplied*

Objective: Establish a Europe wide trauma database.

Method: Through out Europe national databases have been set up. Each national database collects slightly different data using a range of techniques. We would like to establish a Europe wide database in order that these differences can be reduced. The future database could become a useful research tool for the future development of European trauma care. Following on from initial contact in 2000, a letter of interest and intent was forwarded to clinicians throughout Europe.

The drafting of a proposal for the setting up of such a database has followed a positive response. This proposal has been forwarded to the Desk Officer of the European Community in an attempt to obtain European funding. A reply is awaited.

Results: 34 Trauma clinicians were contacted. 23 responded with interest. Interest has come from Scandanavia, Germany, Spain, Portugal, Holland, Switzerland, Croatia, Greece, Ireland and the UK.

Conclusion: An initial enthusiastic response must be followed by progress and development. The setting of core data criteria agreed by all partners is our next target. Parallel development must occur in web based collection. This is considered to be an essential aspect of the proposal.

We welcome further interest and comment.

245 A SURVEY OF CURRENT PRACTICES FOR MANAGING DOMESTIC VIOLENCE (DV) WITHIN ACCIDENT AND EMERGENCY DEPARTMENTS

S.N. Smith. *Address not supplied*

Introduction: DV is a significant social issue. After an episode of DV, victims show increased attendance rates to primary care and emergency departments for non-related conditions. Studies reveal that only 5% of women are questioned about DV in A&E. The Department of Health document on DV states health professionals should be "asking questions routinely" and that protocols should reflect this universal screening.

Method: A postal survey was sent to one hundred A&E departments within the UK. The survey consisted of four questions with a simple positive/negative response options with supplementary questions attached.

Results: The response rate was 80%. Only 31% routinely screened for DV. Only 5% had a formal nursing interview for screening in addition to screening at triage. Of those that had the details of a DV liaison worker in the department, only 38% had this in a form which could be given to the patient. As regards protocols for the management of victims of DV, 22.5% of departments that responded possessed one. 36% of departments have regular sessions on DV as part of their staff training.

Discussion: This survey reveals that under one third of A&E departments routinely screen for DV, and most stated screening was at triage level, which has previously been revealed to have a low detection rate. DV also appears to take a low priority in the educational programmes of the surveyed departments. Improved detection of DV has been shown to occur after implementation of formal educational

Abstract 246

| | SENSITIVITY % | SPECIFICITY % |
|--------------------|---------------|---------------|
| GMSPS ≥ 5 | 67 | 88 |
| STEIHM ≥ 2 | 22 | 69 |
| NIKLISSON ≥ 2 | 33 | 63 |
| LECLERC ≥ 0 | 22 | 68 |
| GARLAND ≥ 2 | 44 | 65 |
| MOC SCORE ≥ 2 | 29 | 76 |
| TÜYÜSZ ≥ 3 | 30 | 76 |
| TESORO ≥ 2 | 67 | 85 |

programmes. Over three-quarters of departments have no protocols for the care of victims of DV, which may lead to inconsistencies. In summary, at present A&E departments are failing to make attempts to identify and manage DV against women.

246 COMPARISON OF 8 SEVERITY SCORES FOR MENINGOCOCCAL DISEASE IN CHILDREN PRESENTLY ACUTELY AND THE APPLICATION TO DETERMINE WHICH BEST INDICATES THE NEED FOR INTENSIVE CARE ADMISSION

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Objective: To determine which of 8 severity scoring systems for meningococcal disease (the Glasgow Meningococcal Septicaemia Prognostic Score (GMSPS), Steihm, Niklasson, Leclerc, Garland, the MOC Score, Tüyüşz, Tesoro) can be best used to identify children acutely presenting with meningococcal disease who will need intensive care (ICU) admission.

Design: Retrospective case note study.

Setting: Emergency Department and Paediatric ward of a District General Hospital.

Patients: During a 13 month period, 35 patients aged less than 14 years with proven meningococcal disease.

Method: A predetermined score associated with high probability of mortality was taken as an indication of absolute need for ICU admission. A score below this had to be determined for definitive ICU admission. The sensitivity and specificity of each scoring system was calculated and will be presented in the poster.

Results: This department uses the GMSPS and the results would validate this practice. Present guidelines are that children with initial GMSPS of 8 or above, or those who after a drop of 3 or more in 1 hour should be admitted to ICU, as they have high mortality. From the results of this study, we feel that ICU admission should be considered for patients with GMSPS of 5 or above (see table).

247 MESSAGE IN A BOTTLE: DELIBERATE INGESTION OF AMYL NITRITE

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Case report: A 47 year old man presented to the Emergency department following an overdose of an unknown substance, in addition to alcohol ingestion. High flow oxygen was administered by the paramedic crew. A small brown bottle containing some of the ingested substance was with the patient.

He was markedly cyanosed, confused (Glasgow Coma Scale 12/15), tachycardic (HR130) and normotensive (BP110/86). Pulse oximetry showed PaO₂ 85% but respiratory effort was normal and unobstructed.

High flow oxygen was continued. An arterial blood sample was taken, and the blood noted to be dark chocolate brown in colour. Arterial oxygen was 44.64kPa, despite deep cyanosis. Methaemoglobin concentration was 19.8%. Oxygen saturation was 99.8%.

At this time, one of the nursing staff identified the small brown bottle as containing "poppers".

A diagnosis was made of methaemaglobinaemia secondary to the ingestion of amyl nitrite.

Toxbase was consulted and the advised treatment followed: intravenous methylene blue 0.1-0.2 ml/kg of 1% solution over 5 minutes and high flow oxygen continued.

Prior to the administration of methylene blue, a second arterial blood sample showed the methaemoglobin concentration to have risen to 24.3%.

Within 30 minutes of methylene blue administration, the patient had made a good recovery. He was no longer cyanosed and his GCS 14/15. He was transferred to the medical admission ward for further observation and discharged after 48 hours with review by the alcohol addiction team.

Discussion: "Poppers" contain the organic compound amyl nitrite. This substance can be used as an aphrodisiac, and is becoming more popular after a reduction in use during the 1990s.

Reference will be made in the poster relating to the diagnosis, investigation and management of methaemoglobinemia and further information relating to "poppers", including a number of illustrations and photographs.

248 ANGIOEDEMA IN THE EMERGENCY DEPARTMENT- THINK ABC THEN ACE

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Background: Angioedema is a rare but potentially life threatening condition presenting to Emergency Departments, (ED) about which little has been published in the Emergency Medicine literature. It is seldom recognized that this is often causally related to ACE inhibitors which should then be discontinued, and mis-diagnosis as allergic reaction or anaphylaxis is common

Objective: To ascertain the prevalence, the identification of possible causation and the management of angioedema presenting to a busy metropolitan teaching hospital ED.

Methods: Retrospective review of notes from patients presenting to the ED with angioedema over a two year period. Literature review of English language papers from 1980–2001.

Results: Fifty eight patients with angioedema were identified, of whom 23 were recorded as taking an ACE inhibitor. In only 5 of these patients was the ACE inhibitor discontinued. Forty three of the patients had an initial diagnosis of "allergic reaction" or "anaphylaxis", and treatment regimens were variable. Three patients required intubation out of 12 with oropharyngeal swelling.

Conclusions: Angioedema is an under recognized and potentially life threatening condition presenting to Emergency departments about which little has been published in the Emergency Medicine literature, and which is often mis diagnosed. Emergency physicians need to be familiar with its presentation, aetiology, and the importance of discontinuing precipitants such as ACE inhibitors.

249 AUDIT OF MERSEYSIDE FLYING SQUADS - A SIX MONTH PROSPECTIVE STUDY

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Objectives: To evaluate protocols, clothing and equipment. To ascertain the frequency of call-outs, interventions performed and evaluate training. To provide regional standards.

Methods: A questionnaire and visit assessed equipment and clothing against current European standards. Team composition, protocols, logbooks and equipment were inspected. A prospective study of call-outs using a proforma for ambulance service requests.

Results: Eight trusts participated. Seven provide 24-hour cover. One had comprehensive protocols. Four had logbooks. Personal protective equipment (PPE) was substandard in 2 (25%) for essentials and 7 (87%) lacked other items eg. gloves. All squads carried crystalloids, colloids and various analgesics. Three (37%) routinely took anaesthetic drugs and staff trained in their use. Eighteen requests were made for flying squads. Two (11%) were cancelled. Teams were not provided due to staff shortages for two calls (11%). Ten (55%) call-outs occurred between 8am – 5pm. Mean time from 999 call to request - 14 minutes. Requests were due to entrapment in all cases, RTAs in 83%. Consultants attended 36%, middle grade doctor 50% and SHO 14%. SHOs accompanied senior doctors to 4 incidents (29%). Interventions included IV access 64%, fluids 57%, analgesia 50%, extrication advice 42%, splintage 36%, airway manoeuvre 7%, amputation (lower limb) 7% and triage 7%. One trust provided comprehensive training. Two trusts gave informal tuition. One trust gave basic training to nursing staff. Four trusts (50%) had no training.

Conclusions: PPE was substandard in 25%. Protocols and logbooks are not universal. Training is absent in 50% of

trusts. Case-note review showed teams provided valuable input. To make pre-hospital activity safe and efficient changes must be implemented.

Recommendations for Regional Standards: North Cheshire protocol as a template for trusts. PPE upgraded to European standards. Pre-hospital care as a mandatory part of teaching curriculums. Senior doctors should attend when possible and opportunities used for training.

250 OUTPATIENT INVESTIGATION AND MANAGEMENT OF PATIENTS WITH SUSPECTED LOWER LIMB DVT, A DESCRIPTION AND AUDIT OF THE SERVICE DEVELOPED BY WREXHAM MAELOR HOSPITAL NHS TRUST

G. Williams. *Address not supplied*

Introduction: The introduction of low molecular weight heparins has allowed the development of protocols for the outpatient management of patients with suspected lower limb DVTs, thus allowing considerable savings in hospital resources. Wrexham Maelor Hospital has developed a unique protocol and audited its success over a 6-month period.

Protocol: All patients with suspected DVT are seen initially in the Accident and Emergency Department. Those considered to be clinically suspicious undergo 2 screening tests; D-dimer (SimpliRed) and digital photoplethysmography (DPPG). If both tests are negative patients are discharged. The remainder undergo colour flow Doppler imaging. Above knee DVTs are warfarinised and managed via the outpatient anticoagulation clinic. Below knee DVTs are managed conservatively. Specific indications for admission are few.

Audit results: Over 6 months 349 patients entered the protocol. 34.4% were discharged on the basis of D-dimer and DPPG results. The remainder were ultrasounded, revealing DVTs in 29.6%. 64.7% of DVTs were above knee. 35.3% were below knee. Only 6% of all patients with DVTs (1.15% of all initial 349 patients) required admission.

Discussion: The Wrexham protocol has been shown to be both safe and effective.

The combination of D-dimer with DPPG as a screening test had a sensitivity of 1.000 compared to 0.957 for D-dimer and 0.798 for DPPG. The specificity for the combination of tests was 0.245 compared to 0.601 for D-dimer and 0.334 for DPPG. To our knowledge no DVTs were missed and there were no complications of anticoagulation. There have been considerable savings in hospital resources; Ultrasound requests have been reduced by 34.4% and an estimated 2662 patient bed days per annum have been saved. A major strength of the service is its 24 hour a day infrastructure.

Conclusion: We have instituted an efficient and cost effective service with clear benefits to both patients and hospital resources.

251 LATERAL RADIOGRAPHS IN HIP FRACTURES. ARE THEY NECESSARY?

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Purpose: To determine whether lateral radiographs of the hip are required for surgical decision making in patients with hip fractures.

Method: A prospective study was carried out on all patients presenting with hip fractures. Standard anteroposterior (AP) and lateral radiographs were taken. The lateral radiograph was placed in a sealed envelope and was not viewed by the emergency doctors or the admitting medical staff. The AP radiograph was reviewed by the orthopaedic the orthopaedic surgeon in charge of the patient and a decision was made regarding surgical treatment. The lateral radiograph was not routinely viewed unless it was deemed necessary by the surgeon. Any change in the surgical decision based on the lateral radiograph was then recorded.

Results: There were 127 patients with pertrochanteric fractures and 171 patients with subcapital fractures. For pertrochanteric fractures a surgical decision based on the AP radiograph alone was made in 114 (90%) of cases. In 13 cases (10%) lateral radiographs were reviewed. In 10 cases there was no change in the operative plan made on the basis of the AP view. In the remaining 3 cases (2%) the proposed operation was changed.

Of 171 subcapital fractures 140 were displaced (82%) and 31 (18%) were undisplaced. A decision was made on the basis of the AP view alone for 108 patients (63%). Lateral radiographs were reviewed for 35 (25%) patients with displaced fracture and influenced

management in 19 cases (14%). Lateral radiographs were viewed for 28 (90%) patients with undisplaced fractures and influenced surgical decision making in 7 cases (23%).

Discussion: Lateral radiographs are a painful procedure in patients with hip fractures and good quality lateral radiographs are often difficult to obtain. In this study they were of very little value in surgical decision making in patients with an obvious pertrochanteric fracture. For subcapital fractures they were considered necessary in a high proportion of patients and influenced surgical decision making in a significant percentage of cases.

Conclusion: Lateral radiographs are not routinely required for patients with pertrochanteric fractures unless there is doubt about the diagnosis. They influence management in a sufficient proportion of patients with subcapital fractures to make routine lateral radiographs worthwhile, particularly if the fracture appears undisplaced on the AP view.

252 A COMPARISON OF SERIAL HALVING AND THE RULE OF NINES AS A PRE-HOSPITAL ASSESSMENT TOOL

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The aim of this study was to determine whether serial halving is comparable to the rule of nines in making initial assessments of body surface area burned following endorsement of the technique by the Faculty of Pre-Hospital Care of the Royal College of Surgeons of Edinburgh.

Ten 'casualties' were made up to represent burn victims (range 6-61%). An external panel of six consultants and one specialist registrar in plastic surgery were invited to assess the simulated casualties. They gave individual and a consensus estimate of body surface area burned. 125 members of local emergency services and military paramedical staff were given a brief video and slide presentation describing either the rule of nines or serial halving. These techniques were then used to assess the ten simulated casualties giving 1,250 estimates of burn surface area.

The understanding of both techniques appeared adequate in both test groups. Estimates from serial halving and rule of nines groups showed variance from the assessments of the external panel. Following 1,250 assessments of burn area no statistical difference was shown between the two methods when analysing patient disposal.

Serial halving has an inherent weakness when assessing certain sizes of burn. The rule of nines has the inherent weakness that the assessors must understand the proportional areas of the body.

The mathematics of percentages and fractions appeared to confuse some assessors. Serial halving is a very simple method of quickly assessing burn areas, making it ideal for triage and initial assessment. It can be taught quickly and assessments using it can easily be guided over the telephone.

253 A CONSIDERATION OF EMERGENCY DEPARTMENT THORACOTOMY IN THE PATIENT SUSTAINING BLUNT TRAUMA

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Introduction: An Emergency Department Thoracotomy (EDT) is one performed "in the ED as an integral part of resuscitating the patient in extremis." In the early 1970s a group of North American surgeons popularised open chest cardiac massage as a resuscitation procedure for patients who had sustained penetrating injury. The aim of the procedure was for the patient to be resuscitated sufficiently that he/she could be transported to the operating room. It was not long before it was used as a resuscitative aid irrespective of whether the patient had sustained penetrating or blunt trauma.

Aims: The study reviewed the available literature on EDT following blunt trauma and quantified the success rate.

Methods: Medline, Embase, The Cochrane Library, The Index Medicus and the articles' reference lists provided the 115 references used in this study.

Results: The search strategy produced 49 papers that included patients who had undergone EDT following blunt trauma. These papers were mainly retrospective case-series. A sum total of 2,064 patients underwent EDTs following blunt trauma and 54 (2.6%) of these patients survived. 14 of these survivors had neurological impairment and one was a late death resulting in a 1.9% functional survival rate. Only three of these survivors are known to have arrived in the ED

without signs of life, (agonal respiration, pulseless electrical activity on the ECG, no swallowing or pupillary reflexes). A further eleven clearly had no recordable vital signs on arrival at hospital.

Conclusion: Patients who have sustained blunt trauma and undergo EDT have a 1.9% chance of functional survival. Patients arriving in the ED without signs of life have a remote chance of surviving an EDT following blunt trauma.

254 ACCIDENT DATA COLLECTION IN OXFORDSHIRE

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In order for any local health authority to prevent accidental injury, it first has to know what accidents happen within its boundaries. In Oxfordshire, as in other authorities, the responsibility for collecting information about accidents is spread over many different agencies both within and outside the health service. Each agency has a particular constituency and role. It collects data for its own purposes and almost never shares them with other agencies. This leads to duplication of effort; failure to track important aspects of accidents; lack of feedback; a fragmented view of accidental injuries; no possibility of subtle or deep analysis of patterns; a bewildering array of untestable prevention strategies; no accountability to the Government; no possibility of comparison with other authorities. Oxfordshire Health Authority has funded a post to examine the different data sources and to write a strategy for bringing them together in a way which reduces each of these problems. The first stage of this work has finished. A description is given of the current accident information flow in the county and the initial ideas for improving this flow are presented.

255 ALCOHOL INTOXICATION IN CHILDREN PRESENTING TO HOSPITAL IN CORNWALL

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Introduction and aims: The risks associated with alcohol use in adults are well recognised. This study investigated the problem of children presenting to hospital with alcohol intoxication.

Methods: Children who presented to hospitals in the western two-thirds of Cornwall with acute alcohol intoxication, proven by laboratory blood alcohol levels, were studied over an 18 month period. This study was part of a multicentre funded injury prevention project based upon the widely accepted Children's Hospital Injury Reporting and Prevention Programme (CHIRPP). Data were extracted and analysed.

Results: 62 children (31 boys) presented with clinical evidence of alcohol intoxication and blood alcohol levels ranging between 6mmol/L - 91mmol/L. 39 children had blood alcohol levels over 40mmol/L (UK driving limit = 17.4mmol/L). 20 children were aged less than 14 years (the youngest being 9 years). 29 children had consumed the alcohol in a public place, 11 at home or in a friend's house. 31 of the children had consumed alcohol in the form of spirits. Only a minority (22 children) presented with an injury, of which all except one were minor. 18 children had a Glasgow Coma Scale of 8/15 or less. All 62 children were kept in hospital for overnight observation and/or treatment.

Conclusions: Extrapolation from these data collected in a rural, socially deprived area indicates that the rate of hospital presentation with alcohol intoxication appears to be in keeping with the available national data. This highlights a significant problem, which needs to be addressed by a variety of measures, giving particular consideration to the ease of access to alcohol by children. Interestingly, the relative lack of any associated injury contrasts strongly with the data available for adults.

256 ARE A&E SHOs GETTING SLOWER?

P. Gilligan, D. Hegarty, R.N. Illingworth. *Address not supplied*

Introduction: The British Association for Accident and Emergency Medicine have suggested that an Accident & Emergency (A&E) senior house officer (SHO) could be expected to see 3,500 patients per year. Our impression was that A&E SHOs are getting slower and seeing fewer patients. We did this study to see if this was so.

Methods: The study took place in a large teaching hospital in an A&E department which sees about 90,000 new patients per year. The department has 12 SHOs working a 52-hour rotating shift. We analysed the data on 118 SHOs who completed six-month posts during a

five-year period between 7/8/96 and 31/7/01. The information recorded included the doctor, their sex, their career plan and the number of new patients seen by them.

Results: Over the five year period the average number of new patients seen by each SHO over a six month period was 1,776 which is consistent with the figure of 3500 per year suggested by the BAEM projection. However, there was a wide variation with a range of 1,069 to 2,659 new patients. The mean number seen in 1996 was 1,745 but this fell to 1,588 in 2001. The 62 male SHOs saw on average 1,880 new patients (range 1,121 to 2659) compared to the 56 female SHOs who saw a mean of 1,675 (range 1,069 to 2,064). There was no apparent difference between the SHOs with a medical or surgical career plan as assessed by the next post held.

Conclusion: Accident & Emergency staffing requirements have been based on the assumption that an A&E SHO would see 3,500 patients per annum. This study shows that this was the case in 1996 but it is not so now. A&E SHOs seem to be getting slower but some are much faster than others.

257 ARE ISOLATED STERNAL FRACTURES ASSOCIATED WITH CLINICALLY SIGNIFICANT CARDIAC CONTUSION?

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Introduction: Historically authors warned that the sternal fracture is the harbinger of serious intra-thoracic pathology and the sternal fracture's association with cardiac contusion has received much attention. It has been routine practice for the patient with a sternal fracture to be admitted to hospital in order to screen for this capricious syndrome; however, recently it has been suggested that an isolated sternal fracture is likely to be a benign injury.

Aims: To discover whether isolated sternal fractures are associated with clinically significant cardiac contusion.

Methods: Medline, Embase, The Cochrane Library, The Index Medicus and the articles' reference lists provided the 83 references used in this study.

Results: The search strategy produced 22 case-series relating to sternal fractures. These papers described 1,711 patients that had sustained a sternal fracture and 775 of these were known to be isolated injuries. Of the patients clearly described with an isolated sternal fracture, (no comorbidity, an otherwise normal clinical examination, normal ECG and only the fracture on the plain radiographs), not one suffered any significant morbidity and none died.

Discussion: The heterogeneous nature of the reporting of these injuries made the analysis difficult. It is clear that sternal fractures can be associated with significant intra-thoracic injury, (including cardiac contusion). Nevertheless, the available literature shows that the isolated sternal fracture is a relatively benign injury: the potential for adverse sequelae is evident at presentation. This study supports the recent proposals by Sadaba et al - (Ann R Coll Surg Engl 2000; 82(3): 162-166) - that patients with an isolated sternal fracture who have no past medical history of cardio-respiratory disease, have a normal chest x-ray, a normal ECG and will manage at home with oral analgesia, may be sent home from the emergency department without the need for in-hospital observation.

258 BREAKING THE CIRCLE OF STRIFE: A UNIFIED APPROACH IN ADDRESSING CHILDREN'S DISTRESS IN EMERGENCIES

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Background: Great strides have been made in improving the lot of children in the emergency department. New techniques, drugs and equipment mean that injuries that in the past required admission for general anaesthetics, etc. can be performed within the emergency department. Such changes have resulted in increased expectations. How do we ensure that every child visiting emergency departments has the least distress possible. A systems approach is required.

Methods: The author has assembled a program of change in a district general hospital seeing more than 28,000 children /year to improve communication with child and carer to achieve consent. In addition, a variety of analgesic and anxiolytic modalities have been established that is system rather than individual-based.

Results: The author will outline the successes & drawbacks at this early stage in the process at time of conference.

Conclusion: A system approach to the care of the anxious child in pain, in conjunction with continuing professional development of all health care professionals, appears to decrease overall distress.

259 CAN A&E CONSULTANTS MATCH THE OTTAWA RULES?

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Introduction: Ankle injuries are among the commonest presentations to A&E Departments. Many studies have discussed the role of senior A&E personnel in major trauma. Few have analysed their performance in the management of minor injuries. This study was completed prior to the introduction of the Ottawa Ankle Rules in our A&E Department.

Aims: To ascertain the x-ray rate of different grades of doctor for blunt ankle trauma.

Methods: Retrospective review of the A&E notes of all patients with acute blunt ankle trauma presenting to the A&E Department at the University Hospital Nottingham from August 1 to Nov 18 1996.

Results: Total number patients 1485. Age range 16-91yrs. Median 30 years. Male female ratio 1.3:1. 78% presented within 48 hours of injury. 1043 (70%) were treated by SHOs, 182 (12%) by staff grades, 71 (5%) by other middle grades 116 (8%) by consultants. Not recorded - 5%. 1298 patients (90%) were referred for radiography. X-ray rate by grade: SHOs 94%, staff grades 98%, other middle grades 80% and consultants 73%. 237 (16%) patients had sustained fractures (including 31 avulsion fractures). 18% of patients were referred to the A&E clinic (of these 25% did not attend). 6 fractures were missed, none by middle grades or consultants.

Conclusions: Most ankle injuries were treated by junior doctors who referred nearly all patients for x-ray. There was over-referral to the A&E Clinic with many patients not attending. X-ray rates reflected seniority. The exception were staff grades who referred 98%. Consultants had the lowest rates of referral for x-ray. Their referral rate of 73% is similar to that achieved in British studies using the Ottawa Ankle Rules. This reinforces the concept that the Ottawa Rules mimic experienced clinicians' practice.

260 COMPARISON OF TISSUE ADHESIVE AND SUTURING IN THE REPAIR OF LACERATIONS IN THE EMERGENCY DEPARTMENT

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Objective: This study was conducted to compare the applications of Histoacryl Blue (HAB) and suturing regarding cosmesis, cost and patient and physician satisfaction in the emergency department (ED).

Methods: A total of 92 consecutive adult patients with lacerations equal to or shorter than 5 centimeters were enrolled in the study. Patients were randomized to either HAB or suturing. Ten-day and three-month cosmetic outcomes were evaluated via Visual Analog Scale (VAS) by a blinded surgeon. Cosmetic outcome, cost and patient and physician satisfaction of both groups were compared.

Results: Only 52 patients completed the follow-up at 3 months. Twenty-eight had been repaired with sutures and 24 with HAB. The differences regarding ten-day and three-month cosmetic outcome scales between the patients repaired with HAB and sutures were not found statistically significant. Application of HAB resulted in greater satisfaction of the patient and the physician (p=0.007 and p=0.000, respectively) (table 1). Costs of HAB were significantly lower than sutures (p=0.000) and were shown in table 2.

Abstract 260, Table 1 Repair methods and satisfaction of the patient and physician

| | Patients Physicians | HAB N (%) | Suture N (%) | HAB N (%) | Suture N (%) | |
|---------------|---------------------|-----------|--------------|-----------|--------------|--------|
| Not satisfied | 1 | (9.1) | 10 | (90.9) | 14 | (50.0) |
| Satisfied | 23 | (95.9) | 18 | (43.9) | 24 | (63.2) |
| Total | 24 | (46.2) | 28 | (53.8) | 24 | (53.8) |

Abstract 260, Table 2 Distribution of costs of procedures

| Cost | HAB | Suture |
|--------------|------------|-----------|
| Below \$10 | 15 (100.0) | - |
| \$10 to \$40 | 3 (16.7) | 15 (83.3) |
| Above \$40 | 6 (31.6) | 13 (68.4) |
| Total | 24 (46.2) | 28 (53.8) |

Conclusion: HAB is a cheaper method of laceration repair and results in greater satisfaction of both patients and physicians, while cosmetic outcomes were comparable. These results suggest that HAB is a viable alternative to suturing for selected lacerations in the ED.

261 DEAD ON ARRIVAL OR DIED IN DEPARTMENT? – FACTORS INFLUENCING CONTINUED RESUSCITATION

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Rationale: Decisions to continue resuscitation into the Emergency Department (ED) in the UK depend largely on the snap judgement of the doctors meeting paramedics at the front door. These doctors may be relatively inexperienced and continue resuscitation when the chance of success is negligible.

Aims: To examine the characteristics of patients suffering out-of-hospital cardiac arrest, and factors influencing decisions to abandon or continue resuscitation in the ED.

Methods: The Northern General Hospital is the sole ED for Sheffield adults and serves a population of approximately 500 000. The ED database was searched from January until December 2000 to identify all patients suffering an out-of-hospital cardiac arrest who subsequently died. Data including "down-time", age, rhythm of arrest, and grade of decision-making doctor were compared.

Results: Of 77180 new attendances, 120 adults suffered out-of-hospital cardiac arrest, had continued attempts at resuscitation en route to the ED, but subsequently died. 52 (43.3%) were certified dead on arrival (DOA) in the ambulance. 65 (54.2%) died despite continued resuscitation attempts in the ED (DID). 3 (2.5%) patients survived. The mean age of DOA patients was significantly older (69.6 years) than DID patients (61.6 years) $p=0.006$. SHOs were more likely to attempt continued ED resuscitation than their senior colleagues ($p=0.03$) and "down-time" was significantly longer for those in whom resuscitation was abandoned on arrival at the ED (mean 40.5 mins vs 30.8 mins, $p<0.001$). VF/pulseless VT was present on arrival at the ED in 15 DID patients. No DOA patient had VF/pulseless VT.

Conclusions: The chance of surviving an out-of-hospital cardiac arrest is poor. If patients were young, had VF/pulseless VT and were met at the ambulance by an inexperienced doctor, they were more likely to be brought into the ED to have continued resuscitation even if it proved futile.

262 ECSTASY AND THE ENVIRONMENT: A CASE SERIES OF TOXICITY

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Objective: There are no published series illustrating acute ecstasy (MDMA) toxicity in patients who have ingested ecstasy while in the same environment. We present data for 7 patients who ingested ecstasy in the same nightclub within a 2-hour period.

Case series: Clinical and toxicokinetic data are shown in the table. Two patients died. Serum MDMA concentrations were obtained 4-8 hours after ingestion. All patients ingested ecstasy in a poorly ventilated underground nightclub during a warm (maximum overnight temperature 17.8°C) summer night (see table).

Conclusion: This series illustrates the range of clinical and biochemical features following ingestion of ecstasy in the same environment. High serum MDMA concentrations correlated with severe clinical and biochemical features including coma, hyperpyrexia, cardiovascular compromise, acidosis and hyperkalaemia. High environmental temperature may have contributed to the observed toxicity.

263 EMERGENCY SURGERY IN PATIENTS IN EXTREMIS FROM BLUNT INJURY TO THE TORSO: HEROIC SURGERY OR FUTILE CARE?

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Trauma strikes unexpectedly, frequently in the young and fit. When trauma victims arrive in the emergency room all possible steps, including surgery, are usually undertaken in an attempt to achieve a successful outcome. However in patients in extremis, cardiac arrest or exsanguinating blunt chest injury the results of resuscitation and emergency surgery are extremely poor.

Seven patients in extremis presented to the resuscitation room of Queens Medical Centre in 2001. All had sustained significant blunt injury to the torso following a motor vehicle / bike crash. Six of the patients had signs of life on arrival; one was undergoing cardiopulmonary resuscitation (CPR), but recovered a cardiac output following pericardiocentesis and fluid administration. Four of the patients went into PEA shortly after arrival but had return of spontaneous cardiac output following a brief period of CPR. The mean injury severity score of the injured patients was 36.1. All the patients underwent emergency surgical procedures; one had a bilateral thoracotomy performed in the resuscitation room, whilst six were transferred to theatre for laparotomy and / or emergency chest surgery. All the patients died within hours of their initial presentation either in theatre or the intensive care unit. TRISS methodology, using the parameters from initial presentation, suggests there were three potentially avoidable deaths.

The concept of futile care in the management of severely injured patients is controversial. The ethical literature defines four concepts of futile care for surgery, however this is countered by reports of survivors from studies of trauma patients in extremis or cardiac arrest. Survivors

Abstract 262

| Case | Age/ Sex | No of tablets ingested | Presentation | Clinical course | Outcome | Blood MDMA (mg/L) |
|------|----------|------------------------|---|--|--|-------------------|
| 1 | M20 | Not known | Collapsed in nightclub | Comatose, temp 43C, pulse 130, BP 60/35, K ⁺ 7.7 mmol/l, pH 7.2 | EMD arrest, resistant VF, death 1 h post admission | 2.40 |
| 2 | M22 | Not known | Fell through glass roof. Trauma screen negative | Comatose, temp 38.5C, pulse 140, BP 80/40, K ⁺ 6.8 mmol/l, pH 7.0 | Hepatic failure, rhabdomyolysis, death 55 h post admission | 0.93 |
| 3 | M18 | 5, and 1g speed powder | Collapsed outside club | Agitated, temp 41.6C, pulse 170, BP 100/40, K ⁺ 5.2 mmol/l, pH 7.28 | 5 day ICU admission, powder identified as amphetamine | 0.33 |
| 4 | M23 | 2 | Self-presented | Alert, temp 37.6C, pulse 148, BP 110/60 | Observed 8 hours | 0.25 |
| 5 | M18 | 4 | Self-presented | Alert, temp 37.2C, pulse 90, BP 150/75 | Observed 4 hours | 0.23 |
| 6 | F18 | 2 | Self-presented | Alert, temp 37.4C, pulse 100, BP 125/65 | Observed 6 hours | 0.13 |
| 7 | M17 | 1 | Self-presented | Alert, temp 37.0C, pulse 80, BP 115/65 | Observed 2 hours | <0.1 |

from these series number only 1-3%, yet this may be seen as justification either for an aggressive surgical approach or an indication that surgery is futile. Guidelines are required on this contentious topic.

264 IN THE MODERN EMERGENCY DEPARTMENT, DOES SKULL RADIOGRAPHY PLAY ANY ROLE IN HEAD INJURY INVESTIGATION?

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Background: 91% of patients with intracranial injuries do not have a skull fracture, yet in Emergency Medicine skull x-ray is often included as an investigation of head injured patients. Our study was designed to assist the clinician in the safe assessment of the head injured patient, and to highlight the difficulties encountered when managing the head injured patient.

Methods: A retrospective audit was carried out, for a 3 month period, of attendances at our Emergency Department, which sees approximately 65,000 patients per annum. Patient charts and skull radiographs were analysed. Patients with G.C.S. of 13 and greater were included in this study as these are the most challenging patients seen in Emergency Department.

Results: Of the 685 skull x-rays reviewed, a total of 11 skull fractures were identified, of which, 1 patient required neurosurgical intervention. We also reviewed 14 C.T. scans done on patients with worsening clinical condition, which showed 8 intracranial abnormalities, despite normal skull radiography. We could find no correlation between skull fracture and intracranial injury in this study.

Conclusion: There is a limited role for skull radiography in the Emergency Department, when investigating head injured patients. Our recommendations include the emphasis on clinical condition of the patient over a period of time, and the further investigation of brain injury with computerized tomography. This will prevent unnecessary irradiation and avoid long delays to patients, thus reducing the workload and financial costs to the radiology department.

265 KNEE INJURIES SUSTAINED IN PAEDESTRIAN ROAD TRAFFIC ACCIDENTS: EPIDEMIOLOGY AND OUTCOME USING A NEW GRADING SYSTEM

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Objective: Knee injuries sustained in road traffic accidents can be severely disabling. Current design guidelines for the front end of motor vehicles aim to reduce tibial fractures but this may be at the expense of an increased risk of injury to the knee itself. The purpose of this study was to describe the type of knee injuries and group characteristics of those sustaining them.

Methods: The medical records of all patients 16 years and over presenting to the Accident and Emergency Department at the University Hospital, Nottingham with a knee injury sustained in a road traffic accident between April 1992 and December 1998 were identified and reviewed using a new grading system.

Results: A total of 374 patients were identified. For the purpose of this study knee injuries were classified into three grades relating to function and disability at six months from the accident and independent of initial severity (table 1). One in five pedestrians struck by a motor vehicle who sustain a significant knee injury (i.e. Grades Ib - III) still require ongoing treatment with limitation of function at six months following the initial accident. On average 48% of significant knee injuries require admission and they spend an average of over two weeks in hospital. Two in five undergo an operation. They need to be

Abstract 265, Table 2 Distribution of injuries in 178 significant knee injuries

| Main Injury | Type | No of injuries | % of total |
|-------------|-----------------------------------|----------------|------------|
| Ligamentous | Anterior Cruciate Ligament (ACL) | 16 | 9 |
| | Medial Collateral Ligament (MCL) | 14 | 7.7 |
| | Posterior Cruciate Ligament (PCL) | 10 | 5.6 |
| Fractures | Distal Femur | 14 | 7.7 |
| | Tibial Plateau | 75 | 42.1 |
| | Proximal tibia | 11 | 6.2 |
| | Fibula neck | 27 | 15.2 |
| | Patella | 7 | 3.9 |
| Other | Dislocation | 4 | 2.2 |
| Total | | 178 | 100 |

seen in the out-patient clinic on a mean of four occasions. Tibial plateau fractures predominate (table 2).

Conclusion: There is a significant workload and morbidity resulting from knee injuries sustained in pedestrian related road traffic accidents and this may be influenced by the current front-end car design.

266 LARYNGOSCOPIC VIEW OBTAINED DURING RAPID SEQUENCE INTUBATION (RSI) IN THE EMERGENCY DEPARTMENT

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Objective: To document the views obtained at laryngoscopy during RSI in the emergency department by anaesthetists and emergency physicians, taking into account the medical seniority of the intubator.

Methods: Data were collected prospectively on every intubation attempt in seven urban Scottish emergency departments for two calendar years commencing 11 January 1999. Data included patient's age, sex, indication for intubation, grade and speciality of intubator, laryngoscopic grade (Cormack-Lehane), number of intubation attempts and complications. Analysis was performed using SPSS™ v9.0.

Results: 1713 patients were entered into the study and 735 patients were classified as having a RSI. Grade of intubation was documented in 91% (671/735). 68.0% of the intubations were classified as Cormack-Lehane grade I, 23.5% grade II, 6.1% grade III and 2.4% grade IV. Anaesthetists had a significantly higher percentage of "good views" (defined as grade I & II) than emergency physicians. Consultants, specialist registrars, senior house officers and staff grade doctors obtained similar percentages of "good views" on laryngoscopy (92%) but experienced senior house officers (SHO III) only obtained good views in 88% of cases.

Conclusions: Anaesthetists obtain better laryngoscopic views than emergency physicians during RSI. The chance of obtaining a good view does not appear to be related to operator grade in either speciality. It may be related to anaesthetists having increased relevant training as well as familiarity and confidence with the Cormack-Lehane grading system, although other factors may be involved.

267 LITTLE SPARCS FOR AFRICA

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Background: In the developed world, weight estimation techniques are increasingly used in paediatric emergencies. Elsewhere children's ages are not always recorded accurately. A weight estimation tape was tested.

Methods: Height, weight, age, date of birth and weight estimation were recorded on 756 consecutive children attending an urban African paediatric facility. This data was analysed using SPSS (Version 10).

Results: The tape reliably predicted weight to the nearest 2.5 kg in children under 12. There was a closer link in the under 5 age group. Only 1 child in the under 5 group had a significantly different weight to that estimated by the tape. The weight by age formula was less accurate.

Abstract 265, Table 1 Grading system for knee injury severity

| | | |
|-----------|--|--------------------|
| Grade Ia | Mild Injury No hospitalisation | 196 patients (53%) |
| Grade Ib | Mild Injury Orthopaedic outpatient follow up | 144 patients (38%) |
| Grade II | Moderate injury Still symptomatic at 6 months | 23 patients (6%) |
| Grade III | Severe injury Still requiring Surgery or with Disability at 6 months | 11 patients (3%) |

Conclusion: The overwhelming majority of children < 5 measured would have their weight safely estimated for the purposes of resuscitation. SPARC would appear to be a system that could be tailored for use in Africa, either by international aid agencies or local health care professionals.

268 LIVER INJURY IN POLYTRAUMA

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Introduction: Haemorrhage in the abdomen following traumatic organ injury is one of the most frequent causes of death. The incidence of abdominal injury in polytraumatized patients is estimated at 41%. Next to splenic injuries, liver injury plays a major role. They remain a difficult injury with a high lethality. We investigated morphology, risk factors and frequent associated injuries in liver injured polytrauma patients.

Methods: Within a retrospective analysis of a polytrauma-data bank (n=240) morphology, risk factors and frequent associated injuries were investigated. 55 polytrauma patients with liver injury (22,9%) were identified. As a control group a 1:1 matched population of polytrauma-patients without liver injury was used. Primary end points were the incidence and volumes of injury to specific liver segments. For risk estimation, two by two contingency tables were used. The odds ratios for paired case control data were determined according to Mantel-Haenzel, with a 95% confidence interval, using McNemars Chi Square test.

Results: Within the patients with associated liver injury we found 40 contusions / haematomas of the parenchyma, 13 capsular ruptures and 2 parenchymal fractures. The mean number of single lesions per patient was 1.8, the mean over all volume 68.5 ml. Most of the lesions were located in segments VI and VII. In comparison injured bikers had less liver injuries (OR 0.25, 95 % confidence interval 0.07 to 0.89, p= 0.02) Pneumothorax was found within the patients group more than in the control group (OR 3.60, 95 % confidence interval, 1.34 to 9.69, p = 0.007). All other injuries were distributed homogeneously.

Discussion: Associated liver injuries are not rare in polytrauma. The current opinion, liver injuries are frequently associated with splenic injuries, was not confirmed by our data. Liver injury constituted a low risk for two wheel drivers.

269 NON INVASIVE VENTILATION FOR ACUTE RESPIRATORY FAILURE: A PROSPECTIVE RANDOMISED PLACEBO-CONTROLLED TRIAL

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Aim: To clarify whether the known effects of non-invasive positive pressure ventilation (NPPV) in patients with acute respiratory failure (ARF) is a real or a placebo effect and whether early application of NPPV in the Emergency department (ED) lead to rapid improvement in patients conditions and outcomes.

Design: A prospective randomised placebo-controlled study in 20 patients with severe ARF (COPD or APO) not improving under conventional medical therapy (STD) and on the edge of intubation. At that point, patients received either STD therapy + two level NPPV or STD + "placebo" NPPV. Need of intubation or cross-over in active NPPV, mortality, morbidity, clinical parameters were recorded.

Results: 10 patients in the active NPPV group rapidly improved and none needed intubation. Placebo NPPV resulted in no change in patients clinical conditions that continued to worsen and 10 patients were cross-over to active NPPV. 3 patients were intubated. Active NPPV led to a rapid and significant improvement in clinical parameters, in pH and PaCO₂ and to a decrease in respiratory frequency and SCM EMG activity.

Conclusion: Early application of two-level NPPV in patients with severe ARF due to COPD and APO leads to a rapid improvement in clinical status and blood gases. NPPV has no placebo effect.

270 PSEUDOANEURYSMS OF THE SUPERFICIAL TEMPORAL ARTERY

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Acute pseudoaneurysms of the superficial temporal artery (STA) are a rare but well recognised consequence of blunt facial trauma. This

poster describes three cases of blunt trauma to the temporal region, which resulted in the formation of pseudoaneurysms. All patients had a delayed presentation to the Emergency Department. We describe the clinical presentations, subsequent management and pitfalls encountered when dealing with this condition.

Doctors working in emergency medicine should be aware of traumatic pseudoaneurysm as being among the differential diagnoses of patients presenting following recent injury with a persistent swelling of the scalp. Although formal surgical treatment of the lesion is straightforward, attempts at incision and drainage of a mistakenly diagnosed lesion could have undesirable consequences.

271 RESUSCITATION ANALYSIS IN THE RESCUE SERVICE AREA OF DACHAU: QUALITY MANAGEMENT IN THE RESCUE SERVICE

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Based on a prospective study, resuscitations in a rescue service area were to be analysed with respect to place, time, primary rhythm, measures taken and the outcome of the patients. The collective analysed comprises the District of Dachau, Bavaria, emergency medical service being exclusively provided by the Bavarian Red Cross.

A demanding training of the paramedics who have to undergo annual tests in ACLS and early defibrillation has been running for several years. A first-responder system has been installed. The ambulances as well as the first-responder are equipped with AEDs. The patients are resuscitated according to a preset resuscitation algorithm including early defibrillation by rescue service staff and drug treatment on the basis of the AHA guidelines.

Based on a record sheet, all resuscitations within the period of meanwhile two years were recorded. In total, there were 196 resuscitations, with an increase of 29% in the second year. The average age was 62.4 years. The most frequent cause for the resuscitations were internal diseases (72%). Most patients were treated at home and a majority of the cardiac arrests were witnessed by bystanders (61%). In the first year only 12% of the patients was resuscitated by laymen, while in the second year an increase to 29% was seen.

As to the outcome over 40 % could be taken to hospital after return of spontaneous circulation. The rate of long term survivors was 12% in the first year, most of them (75%) with a good neurological outcome.

Conclusion: First-class technical equipment and superior training of the rescue service staff as well as increased teaching of laymen-CPR may thus significantly improve the rate of successful resuscitations. So it can be shown that quality management leads to higher quality standards also in rescue service, significantly improving the emergency medical service for the population.

272 RISK MANAGEMENT IN THE A&E DEPARTMENT

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Objective: To develop an effective risk management strategy suitable for the needs of a busy Accident and Emergency (A&E) department

Design: Clinical incident forms were designed and incidents graded according to potential risk (mild/moderate/serious/near-miss). A "no-blame" statement made it clear that completion of the form would not lead to any disciplinary action, apart from in exceptional circumstances. Staff were encouraged to complete the forms in real time. Regular risk management meetings were held to discuss and act on the issues raised. Feedback was given to members to staff at training sessions.

Setting: An inner city teaching hospital A&E department in London, UK.

Results: The number of incidents reported increased from 93 in 1998 to 406 in 1999 and 719 in 2000 (27% of all clinical incidents reported within the Trust). Within the surgical directorate, the A&E department became the major source of clinical incident reporting (53%). Nurses reported 60% of the incidents in the A&E department.

The most common types of incident reported were "did not wait" (166/719=23%), "delay in diagnosis" (90/719=12.5%) and "delay in obtaining a bed" (54/719=7.5%). Common contributing factors to incidents included high workload, difficulty obtaining a porter and staff shortages.

A number of changes were made within the department and the hospital in response to concerns raised. These included a system to avoid patients going home with an intravenous cannula in situ, a particular type of laryngoscope blade was changed, and the reporting

process for urine microscopy was altered. A list of basic equipment required for the A&E department was produced for the Trust risk management group. Any equipment not stocked at that time was subsequently purchased.

Conclusion: Practical clinical risk management policies can be achieved within a busy department, leading to operational changes in departmental practice. This met with overwhelming staff approval and produced patients benefits, as well as minimising sources of clinical risk.

273 ROLE OF GASTROINTESTINAL DECONTAMINATION IN THE MANAGEMENT OF ACUTE DRUG OVERDOSE. CONSIDERATIONS ON TWO CASES OF INTENTIONAL POISONING

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Current guidelines for gastrointestinal decontamination in acute drug overdose have often been criticized and are not often followed in the clinical practice. Emergency physicians must always consider risks and benefits of gastrointestinal decontamination procedures in relation to the possible toxicity of the drug. Here we describe two cases in which we performed gastrointestinal decontamination procedures, although not indicated by the current guidelines.

Case 1: 66-year-old female patient, reporting suicidal ingestion of 50 carbamazepine "s.r." tablets each containing 400 mg., four hours before E.R. admission. The patient had no complaints, vital parameters, physical examination and routine laboratory tests were normal. We performed a gastric lavage, gastroscopical brushing and we dosed the drug in serum and in gastric aspiration fluids. The procedure allowed the removal of about 80% of the ingested drug (15,672 mg).

Case 2: 68-year-old male patient, with medical history of hypertension, C.O.L.D., depressive syndrome. On admission the patient was unconscious, GCS: 7. Eight empty vials of diazepam drops were found next to his bed. The patient underwent gastric lavage, activated charcoal, cathartic administration, and continuous infusion of flumazenil. Toxic serum levels of benzodiazepine were still present after six days. A second intestinal decontamination with cathartics was undertaken with rapid clinical resolution. We can hypothesize that in this patient persistent toxic levels of diazepam could be due both to a prolonged half-life of the drug because of age and clinical status, and to a persistent intestinal absorption days after the ingestion.

Current guidelines would consider not indicated the gastrointestinal decontamination in both our cases (case 1: absence of symptoms and delayed admission to E.R.; case 2: ingestion of rapidly absorbable drugs). This confirms the poor knowledge and the low reliability of the pharmacokinetics studies for what concerns absorption, metabolism and elimination of drugs in acute overdose. We believe that for every patient with acute drug poisoning a gastrointestinal decontamination procedure should be considered, although the routine use of gastric lavage in all patient is not supported by literature data and in clinical trials there is no evidence of clinical benefits of gastrointestinal decontamination. In fact, in both our patients significant amount of drug was removed by these procedures several hours post-ingestion.

274 SCOTTISH URBAN RURAL TRAUMA OUTCOME STUDY

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Objective: To compare the outcome of patients sustaining significant trauma in a rural environment to those in an urban environment.

Design: Prospective, multi-centre, observational study of the catchment population of a regional neurosurgical centre serving 2.8 million people in the West of Scotland.

Methods: Scottish Ambulance Service population density information was adapted to define urban (>0.5 persons per acre) and rural (<0.5 persons per acre) populations. Patients who fulfilled the entry criteria of the Scottish Trauma Audit Group were entered into the study. TRISS methodology was then applied to the results. Outcomes were measured in terms of length of intensive care and hospital stay and mortality.

Results: 4636 patients were entered into the study, with 3962 (83.6%) classified as urban and 674 (14.2%) classified as rural (105, 2.2% records missing). There were significantly fewer low falls,

assaults and penetrating injuries in the rural group and more road traffic accidents and sports incidents in the rural group. There were more females in the rural group ($p=0.02$). More patients in the rural group were treated by paramedics and transported by air, and rural patients had longer prehospital times overall. There was no difference in mortality in A&E (6.3% urban, 4.2% rural, $p=0.52$). More rural patients spent time in intensive care ($p<0.001$) but the length of stay is similar for both groups ($p=0.44$). Rural patients were significantly more likely to be treated by consultant surgeons ($p<0.001$) and anaesthetists ($p=0.005$). There was no difference in overall mortality between the urban (7.2%) and rural (5.9%) groups ($p=0.28$).

275 SERIOUS INJURY IN ROCK CLIMBING AND NON-ROCK CLIMBING FALLS

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Background: Rock climbing is an increasingly popular pastime in the UK, with an estimated 150 000 regular participants. This study was undertaken to determine which factors influence the likelihood of serious injury in rock-climbing falls and other accidental falls.

Methods: A prospective cohort study of falls due to rock-climbing and other accidental falls (from a height greater than 2 metres) presenting over a five year period. Logistic regression analysis was carried out to determine which factors were predictive of serious injury.

Results: Twenty seven climbing and 132 non-climbing falls were included in the study. Forty two (26.4%) subjects sustained serious injury (Injury Severity Score > 15). Univariate logistic regression showed being a climber, height of fall, head injury, facial injury, thoracic injury and lower limb injury to be predictive of serious injury. Multivariate analysis demonstrated that being a climber ($p=0.05$, odds ratio (OR) 0.201, 95% confidence interval (CI) 0.004 to 1.002), height of fall ($p=0.002$, OR 1.228, 95% CI 1.081 to 1.394), head injury ($p<0.001$, OR 12.527, 95% CI 4.644 to 33.787) and thoracic injury ($p=0.001$, OR 7.484, 95% CI 2.207 to 25.376) were independent predictors of serious injury.

Conclusion: Rock climbers are less likely to sustain serious injury than subjects in non-rock climbing falls. Injury to the head or thorax considerably increases the likelihood of serious injury. Potential explanations for this include the use of safety equipment, variations in mechanism of injury, and a possible protective effect of energy dissipation through injury to limbs. Methods for improving clinical evaluation of patients sustaining such falls are suggested.

276 SETTING UP A RADIO-MEDICAL ADVICE SERVICE

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Introduction: Our Radio-Medical Advice (RMA) Service provides medical advice to ill and/or injured people on board ships or in remote places.

Background: The Emergency Department in Queen Alexandra Hospital (QAH) is one of two units in the United Kingdom that provide a 'Radio-Medical Advice Service' to ships. Prior to 2000, this service was provided on a 'grace and favour' basis by two venues, Aberdeen Royal Infirmary (ARI) in the North and Plymouth/Haslar in the South. In 2000, the Maritime and Coastguard Agency (MCA), in an attempt to standardise the RMA service throughout the country, awarded 3-year contracts to the Emergency Departments at QAH in the South and ARI in the North, to provide this service.

Setting up the service: The 'RMA' Service' was set up as a completely new service in the Emergency Department at QAH, in close collaboration with the MCA, colleagues at ARI and the local Maritime Rescue Centre. We established a designated 'RMA Room' with a dedicated telephone line, contact information of all the coastguard rescue centres, phonetic symbols and other relevant maritime information. We drew up a common 'Data Collection Form' for both hospitals. Calls are always received by or discussed with the duty senior doctor to ensure quality control. We have also set up databases at both centres for the purpose of record-keeping and subsequent audit; and teaching/awareness programmes for all doctors in the department.

Results: The service has dealt with a large number of advice calls over the first 15 months of the service, increasing from approximately two calls per week at its inception to three times this figure. Advice has been sought from vessels all over the world, with ships in more remote locations tending to use Portsmouth rather than Aberdeen. The full

spectrum of medical conditions has been encountered, from sprained ankles in the North Sea to diabetic coma in the Southern Ocean.

277 SOFT CAST PLASTERS FOR BUCKLE FRACTURES OF THE DISTAL RADIUS

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Buckle fractures (Torus fractures) of the distal radius are one of the most common fractures in children presenting to the A&E Department. These fractures are generally undisplaced and have an excellent prognosis with the vast majority having healed in three weeks. When children return to have their plasters removed they can be distressed with the noise and sensation generated by a standard plaster saw. Soft Cast (3M Healthcare) is designed to give the stability and strength of a standard synthetic cast, however, it can be easily removed in the same way as a simple bandage can be removed. The child's parents can do this at home.

This study was designed in two phases. The first phase used soft cast instead of standard Colles type plasters and the patient's parents were asked to take the plaster off at home prior to them attending the A&E Fracture Clinic. In the second phase formal follow-up was not arranged at the Fracture Clinic and the patients were given written and verbal instruction on removing the plaster at home. Follow up was by telephone.

Results: In the first phase 20 children were treated; 2 were excluded due to minor cast problems – both replaced with Plaster of Paris casts. 17 were non-tender at review and discharged. 1 was minimally tender but no further treatment required. In the second phase 23 patients were treated. 21 removed the cast at home with no complications. One was reviewed at the fracture clinic and 1 parent was unhappy to remove the cast and had it removed at the clinic.

Conclusions: This study illustrates that buckle fractures can be safely treated with Soft Cast. Routine review at three weeks is not essential provided the parents are provided with written and verbal instruction and there is open access to daily fracture clinics.

278 SUBARACHNOID HAEMORRHAGE: ARE WE ACHIEVING OPTIMAL CARE?

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Subarachnoid haemorrhage (SAH) is a common problem, affecting 1 in 10 000 people in the UK each year. It is a time critical emergency with outcomes for the survivors of the initial bleed directly related to the speed of their post-event treatment. The purpose of this audit was to assess the time taken to reach the diagnosis of SAH and identify any areas of greater efficiency, for patients presenting to our Accident and Emergency (A+E) Department.

A retrospective audit was conducted for all patients presenting to A+E between 1st April 2000 30th November 2001. Patient demographics, the times taken for review by A+E staff and the time taken to obtain a CT scan (from presentation) were recorded. Also noted was the specialty requesting the scan – either A+E or the inpatient admitting team at our hospital.

The mean waiting time for A+E review was 37 mins. The mean time taken to obtain a CT head scan was 4.44 hrs – this was greatly influenced by the requesting team. Scans requested by A+E took on average 1hr, 41mins. Those by the inpatient team took 6.8 hours. A+E initiated scans were also more likely to show an intracranial bleed (83% versus 66%). Almost a third of patients required urgent neurosurgical transfer. Those patients needing transfer waited 59 mins for their scan, if it was requested by A+E, but almost 6 hours if scanned by the admitting team.

The management of patients presenting to our A+E with a provisional diagnosis of SAH could be greatly improved if their diagnostic CT head scans were all requested as part of their initial A+E review.

279 THE CONTINUOUS QUALITY IMPROVEMENT PROJECT IS THE CHALLENGE TO CHANGE

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The Excellence Accreditation program started, in our Emergency Department (ED), on 1997, through a self-valuation strategy. The

whole team (physicians and nurses) were set up, and a statistical research was performed in order to assess the expectancy and received quality in ED.

Considerations were made on: complexity of health care in Emergency Medicine in the context of a high specialization and intensity care; the "process" in ED- Access, Waiting, Medical examination; technical, relational, managerial, environmental quality; critical solving problems;

Change strategy; standard, clinical indicators and values; work planning (quality list); improvement actions.

The most important changes observed were:

- Elaboration of a shared and written "Mission"
- Triage filter to improve the Reception, to give category code according to shared protocols
- List of services available shared by the Client Representative Organization
- Observation and complains "mail service" for clients
- Continuous empowerment oriented to Quality (health care education program to quality, BLS, ALS, ATLS, adult and pediatric learning program, teaching team for BLS, new staff, training doctors and students education program, emergency situations and surgery abilities learning, link to Scientific Societies and foundation of the Italian Society of Emergency Medicine – S.I.M.E.U. – clinical research on acute coronary syndrome.
- Clinical indicators to address the patients care processes (waiting time relative a triage code, thrombolysis started within 30' of presentation in ED for AMI)
- AUDIT activity
- Available, periodically revised and shared guidelines, according to EBM
- ED computerized software procedures, introduced to automate the medical attendance for client
- Management control procedures
- Bonus system oriented to quality
- This method has risen the spur to work and the participation to Continuous Quality Improvement projects

Learning has to be considered as a strategy to change, so a Learning Organization has been built. This should be considered as an important part of the ongoing process of improvement.

280 THE EFFICACY AND SAFETY OF PRE-HOSPITAL RECTAL DIAZEPAM FOR SEIZURE CONTROL IN CHILDREN

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Introduction: Many ambulance services in the UK have introduced protocols for PR diazepam administration without full evaluation of its effectiveness and safety. Evidence to date suggests that diazepam is more likely to cause respiratory distress than lorazepam. This study was undertaken to assess the efficacy of pre-hospital rectal diazepam in terminating seizures in children and to assess the risk of respiratory distress in this setting.

Method: A 15-month retrospective study of children with prolonged seizures, including status epilepticus, presenting to the Accident and Emergency department at the Leicester Royal Infirmary was undertaken. Patients were included if they were less than 16 years of age, transported to hospital by a paramedic crew, were convulsing at the scene and had a discharge diagnosis of prolonged generalised seizure.

Results: A total of 50 episodes of prolonged seizures were identified in 37 children. 14 received treatment with rectal diazepam at home and 12 received no treatment. Paramedics administered diazepam to 24 children with a complete response in 17 (71%). 3 episodes initially responded but reoccurred (12%) and in 4 cases rectal diazepam had no effect (17%). The time from the onset of seizure to paramedic treatment ranged from 10-75 minutes (mean 25 minutes) with 8 children convulsing for more than 30 minutes. One child had a respiratory arrest following treatment and was intubated immediately on arrival in the A&E. No other child who received rectal diazepam pre-hospital developed respiratory distress. Of those who did not receive treatment 2 were in severe respiratory distress, one was known to be hypersensitive to diazepam and one child stopped fitting before treatment could be administered.

Conclusion: The use of rectal diazepam in the pre-hospital setting is safe and effective. It reduces the total duration of the seizure episode and thus the risk of systemic and neurological sequelae.

281 THE GCS: WHAT'S THE SCORE?

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Introduction: The 15-point Glasgow Coma Scale (GCS) has been a universally accepted clinical assessment tool for almost 30 years. It allows objective and reproducible evaluation of the level of consciousness and is particularly useful for the management of head injuries. When first published in 1974, the GCS consisted of only 14 points. The additional point, which makes discrimination between normal and abnormal flexion possible, was introduced in 1976. Personal observation shows that neurological observation charts based on the 14-point GCS are still in use in many hospitals throughout the UK. As the parallel use of different versions of the GCS carries the potential for clinical error, we wanted to quantify the scale of the phenomenon.

Methods: We have conducted a national telephone survey of all Accident & Emergency Departments throughout the UK receiving patients with head injuries, and the wards where such patients are admitted for observation.

Results: We found that almost all of the A&E Departments sampled are using the 15-point scale. In contrast, about one third of the surgical or orthopaedic wards contacted are continuing to use charts with a 14-point GCS.

Conclusion: Neurological observation charts with the long superseded 14-point GCS continue to be in use on the wards of many hospitals in the UK. This practice carries the risk of clinical error and should be addressed urgently.

282 THE IMPACT OF A NEWLY OPENED PRISON ON AN ACCIDENT & EMERGENCY DEPARTMENT

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Aim: To determine the impact of a newly opened prison on an Accident and Emergency department (A&E).

Method: A new category B maximum security prison opened in April 1999, the first privately run prison in Scotland and the third largest in capacity. All prisoners referred to the A&E department for treatment were identified prospectively during the first year following the opening of the prison.

Results: 104 prisoners attended during the one year period. Ages ranged from 18 - 64 years with a mean age of 29.8 years. Presentations were as a result of deliberate self-harm (22%), injury following violence (18%), sports injury (15%), surgical condition (15%), medical illness (13%), accidental injury (9%), ENT problem (2%) and miscellaneous (6%). 37 prisoners (35.6%) were admitted to the hospital. Further review at out-patient clinics was arranged for 15 prisoners. One prisoner died, the result of suicide by hanging. The remaining prisoners were returned to the prison for further management by the prison medical and nursing team. 12 prisoners re-attended a total of 37 times, ranging from twice to a maximum of eight visits. 42.3% of attendances were during "working hours" (9am-5pm). 57.7% attended "out of hours" (5pm-9am). 24 referrals (23.1%) were deemed inappropriate by the prison medical team on retrospective review. 16 of these occurred "out of hours". 41 prisoners (39.4%) were known to have a history of intravenous drug abuse (IVDA). Including re-attenders, 59 presentations (56.7%) to the A&E department had a history of IVDA. Of the 41 prisoners, 11 (26.8%) were Hepatitis C positive, with eight of these having a positive PCR test. No prisoners had HIV and only one prisoner was Hepatitis B positive.

Conclusion: The opening of the prison provided only a slight increase in the workload of the A&E department. However, a significant proportion of prisoners were admitted to the hospital highlighting specific problems of managing people restrained and in custody. The majority of cases can be safely referred back to the prison healthcare team for further management. Increased input is required from the prison medical team when dealing with deliberate self-harm, frequent attenders and "out of hours" referrals. All A&E staff must be aware of the increased risk of Hepatitis C infection when dealing with a confined prison population.

283 THE PAIN OF LOCAL ANAESTHETIC NEEDLE INSERTION IN MINOR SKIN LACERATIONS

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Objectives: The primary objective was to compare the pain of inserting local anaesthetic needles through the open wound (group A) against insertion through intact skin at the wound margin (group B). Secondary objective was to ascertain the comparative effectiveness of anaesthesia produced.

Methods: This was a randomised clinical trial with consecutive recruitment of a pre-calculated number of 80 eligible adults (over the age of 18 years) with minor skin lacerations. 40 patients were randomly allocated to each group. A difference in pain score ≥ 1 in 10 on a visual analogue pain scale was deemed clinically important. Baseline demographic data, wound length and anaesthetic volume were recorded prospectively. Pain scores were recorded at presentation, on needle insertion, at 5 minutes and during suturing.

Results: The difference between the mean pain score of needle insertion in group A and group B was -1.2 with a 95% CI from -1.83 to -0.57 and an associated P value of <0.001 . There was no statistical difference in age, gender distribution, mean wound length, mean anaesthetic volume, pain score on presentation and during suturing.

Conclusion: Patients commonly attend the Accident and Emergency department with traumatic wounds that requires local anaesthetic wound infiltration and suturing. While both methods of local anaesthetic injection are commonly used, some authors have recommended that the anaesthetic needle should be inserted through the open wound rather than through intact skin at the wound margin, in order to minimise patient's discomfort. In this study, pain caused by injecting through intact skin margin was 1.2 greater than that through the open wound, and this was clinically and statistically significant. The needle for L.A should therefore be inserted through the open wound to minimise the discomfort to the patients.

Discussion: Patterns of trauma are different for urban and rural trauma. Rural patients take longer to get to hospital and are more frequently transferred, but are more likely to be treated by senior staff. Mortality in both groups is similar. Implications for trauma services will be discussed.

284 THE ROLE OF CHEST CT FOR DIAGNOSING THORACIC INJURIES IN MAJOR TRAUMA

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Objectives: To determine whether supine chest xray findings correlate with the chest CT findings in major trauma. To establish whether additional findings on chest CT alter subsequent management.

Methods: Retrospective 5 year review of all emergency chest CT's in major trauma at a District General Hospital. 1. Comparison of chest CT and chest xray findings in each patient. 2. Case note review to investigate changes in subsequent management.

Results: Out of 44 patients, 15 patients had chest CT's for wide mediastinum, 17 were included in this study and for 12 patients case notes was not accessible. 13 out of 17 patients (76%) had significant diagnostic discrepancies like haemothorax, haemopneumothorax, anterior pneumothorax, pneumo pericardium, pneumomediastinum, pulmonary contusion and atelectasis. 10 out of 17 patients had subsequent change in management like insertion of chest drain, thoracotomy, rib resection & drainage (blocked drain tube), ITU admission and conservative management.

Conclusion: Chest CT is an invaluable imaging modality in the management of patients with chest injuries following major trauma. In view of the limitations of supine chest xray a lower threshold for chest CT is advisable.

285 THE ROLE OF EMERGENCY FLYING SQUAD IN THE MANAGEMENT OF CARDIAC ARRESTS

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Introduction: The Accident Flying Squad was first established in the United Kingdom at the Derbyshire Royal Infirmary in 1955 mainly to provide immediate medical care to the victims of the accidents. However, this service is currently used for medical emergencies particularly for pre hospital cardiac arrests more than for trauma emergencies

Objective: To examine the role of the Derby flying squad with regard to management of the cardiac arrests.

Design: Retrospective study over five years from January 1996 to December 2000

Subjects: 169 patients with pre hospital cardiac arrests

Intervention: Treatment provided by the squad team

Main outcome measures: Return of spontaneous circulation, hospital admission, survival to hospital discharge.

Results: There were 169 patients with pre hospital cardiac arrests of whom 95(62%) patients were in asystole, 29 (17%) in Pulseless Electrical Activity (EMD), 24 (14%) in Ventricular Fibrillation and 14(8%) had return of spontaneous circulation. One patient was in Bradyarrhythmia and the rhythm of six patients were unknown. 111 intubations were performed out of which 43 (38%) were performed by the squad team leader. One needle thoracocentesis, one chest drain and three pericardiocentesis were performed. 20 peripheral intravenous access, 5 intra-osseous access and 3 central venous access were carried out. One surgical airway and one saphenous venous cut-down were attempted unsuccessfully. 101 (60%) patients died at the scene, 45(27%) died at the hospital, 21 (13%) survived to hospital discharge and the outcome of two patients is unknown because they were admitted to other hospitals.

Conclusions: Our survival rate is consistent with that of the published literature. The flying squad did not improve survival of patients with asystolic arrests, while ventricular fibrillation can be effectively and safely managed by the paramedic crews. Overall, the outcome of the pre hospital cardiac arrest patients does not appear to have been improved by the Emergency Flying Squad.

286 THUMB UCL INJURIES: MAKING THE DIAGNOSIS IN THE A&E DEPARTMENT

Introduction: Complete disruption and displacement (Stener lesion) of the Ulnar Collateral Ligament (UCL) of the thumb metacarpal phalangeal joint (MCPJ) can give rise to long-term morbidity and requires prompt recognition and treatment.

Aims: To compare the effectiveness of systematic examination performed by a single observer of suspected UCL injuries of the thumb with casualty officers in making the diagnosis and assessing injury severity.

Methods: 27 patients with suspected UCL injuries were gathered prospectively from attendances at an A&E Department. Stability of both thumb MCPJs was assessed in extension and in flexion before and after direct infiltration of local anaesthetic around the site of injury. Joint opening was measured clinically and radiologically (stress views).

Results: 24 of the 27 patients were diagnosed as having probable UCL injuries at initial consultation in A&E. The remaining 3 were initially thought to have scaphoid fractures, and the UCL injury diagnosed at a standard review clinic. Stability of the UCL injury at initial consultation was documented in only 2 cases. When reviewed by the single observer, initial examination confirmed stability in 9 joints. Only after local anaesthetic was it possible to examine the remaining patients adequately. In total, 20 patients had a stable thumb MCPJ. 6 patients had significant joint instability and were referred for surgical repair. One patient was allergic to local anaesthetic and the extent of his UCL injury could not be adequately assessed. Stress radiography demonstrated significant joint opening only in those patients who clinically had unstable MCPJs.

Discussion: UCL injuries are poorly assessed by casualty officers. This is principally due to patient pain during examination. By directly infiltrating local anaesthetic around the site of injury the likelihood of making the diagnosis and determining the severity of the injury is perfectly feasible in everyday clinical practice within the A&E Department.

287 VALIDATION OF THE OTTAWA KNEE RULES IN A UK EMERGENCY DEPARTMENT

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Objectives: (1) To test the validity of the Ottawa Knee Rules for decisions on the use of radiography for acute, isolated knee injuries. (2) To compare knee radiology requesting pattern before and after formal introduction of the Ottawa Knee Rules (O.K.R.) in a U.K. Emergency department.

Methods: Questionnaires containing specific clinical findings and O.K.R. criteria were completed by all clinicians seeing patients, over 18yrs, with isolated knee injuries for one month before and two months after formal introduction of the O.K.R. in a district general hospital Emergency department. Follow up of all patients was undertaken to ascertain final diagnosis of bony, or non-bony injury. The results

were analysed to determine sensitivity, specificity, positive and negative predicted value of the O.K.R. Comparisons between the proportion of knee radiographs requested before and after the introduction of the O.K.R. were made.

Results: 136 patients were enrolled and followed up over a 3-month period, with 58 prior to and 72 post O.K.R. introduction. Application of the O.K.R. had a sensitivity of 100% (71.8 – 100%), specificity of 55.1% (46.1 – 64.1%), positive predictive value of 18.5% (9.03 – 27.9%) and negative predictive value of 100% (87.8 – 100%). Introduction of the O.K.R. showed a significant reduction in the number of radiographs performed on patients who were O.K.R.-negative from 33.3% (10 out of 30 patients) to 11% (4 out of 35 patients) $p=0.016$, and a non-significant trend towards a reduction in the total number of radiographs performed, from 58.6% (34 out of 58 patients) to 55.6% (40 out of 72 patients) $p = 0.726$.

Discussion: This study confirms the validity of the Ottawa Knee Rules in a U.K. hospital setting. Previous studies in the U.S.A and Canada have shown the rules to be valid, and to reduce the number of radiographs performed by attending emergency physicians. This study shows that the Ottawa knee rules can safely be introduced into a U.K. emergency department with satisfactorily high sensitivity and negative predictive value.

288 WARFARIN IN THE EMERGENCY DEPARTMENT, THE HIDDEN DANGERS

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Warfarin therapy can influence management in a variety of presentations to the Emergency Department including major trauma, myocardial infarction and soft tissue injury and infections. This study looked at patients attending the anticoagulant clinic at the Mater Hospital over a year period and who also attended the Emergency Department over the same period (N=65). Patient notes were checked to ascertain whether the attending doctor was aware of concomitant warfarin therapy. In 42% of cases the doctor appeared to be unaware of warfarin therapy. 6% of patients had nonsteroidals inappropriately prescribed. 6% also had antibiotics prescribed and of those that were discharged none had early INR arrangements made. Of all the patients who were seen with head injuries on warfarin none were admitted despite current guidelines to do so. Of patients presenting with bleeding/bruising (13.8%) only one third had an INR checked. This study has important implications for SHO teaching and patient safety.

289 WRIST FRACTURES IN SOCCER GOALKEEPERS : A ONE YEAR PROSPECTIVE STUDY.

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Objective: When saving a ball that has being kicked with force a goalkeeper will sustain a forced dorsiflexion action at the wrist joint similar to the injury mechanism of falling on the outstretched hand. We aimed to determine the type of wrist fractures sustained by goalkeepers when saving a ball during participation in organised or recreational soccer.

Method: Adults and children attending the Accident & Emergency department of Crosshouse hospital, Kilmarnock with a wrist fracture from goalkeeping at soccer were identified prospectively over a period of one year.

Results: 19 patients were diagnosed as having a wrist fracture. Ages ranged from 7 – 41 years. 13 patients were children (under 16 years on day of presentation). The following injuries were seen:

- 12 Greenstick # distal radius
- 2 Undisplaced distal radius #
- 1 Displaced distal radius # requiring manipulation
- 1 Colles # requiring manipulation
- 1 Comminuted distal radius #
- 1 Radial styloid #
- 1 Scaphoid # (waist of scaphoid)

The 12 greenstick # and one displaced distal radius # occurred in children. The remaining fractures were in adults. 3 further patients were initially diagnosed as having a "clinical scaphoid #" who were later found to have no radiological evidence of scaphoid injury on further examinations. There were also 7 soft tissue injuries to the wrist.

Abstract 289a

| Number of patients | Diagnosis | Deviation | Algorithm recommendation |
|--------------------|-------------------------------|----------------------|--------------------------|
| 1 | GCS 5 Intracranial haematoma | Referred medics | Refer Neurosurgery |
| 1 | Subarachnoid haemorrhage | Admitted A&E | Refer Neurosurgery |
| 1 | LOC. GCS 13. CT head normal. | Discharged | Admit A&E |
| 10 | No LOC. GCS 15 | CT scan | No CT scan |
| 4 | LOC. Normal CT | Discharged | Admit A&E |
| 1 | GCS 14. CT cerebral contusion | Admitted Max- Facial | Refer Neurosurgery |
| 20* | No LOC. GCS 15 | Admitted A&E | Discharged |

LOC, loss of consciousness.

5/20* lived alone, 7/20* awaiting Maxillo-Facial review, 2/20* late attendance, 2/20* on anticoagulants (CT normal), 1/20* domestic violence, 1/20* elderly partner, 1/20* unaccompanied 16 year old) 54/94 (57%) of patients had a CT scan, 44(81%) following the algorithm. 12/54 scans (22%) were abnormal and all these patients had lost consciousness. 10 CT scans were performed on patients with no LOC and GCS 15. Indications included anticoagulation, significant mechanism of injury and post concussion symptoms. All these were normal. 5 were done the day following admission.

Conclusion: Significant injury can occur when a soccer goalkeeper saves a football kicked with force. All Accident and Emergency doctors must be aware of the potential for injury from goalkeeping in soccer in what may at first appear to be a trivial mechanism of injury, especially in children, and manage accordingly.

289a MANAGEMENT OF PATIENTS WITH ISOLATED HEAD INJURY: ONE HOSPITAL'S EXPERIENCE

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Objective: To identify the care pathways taken by adult patients following publication of the Royal College of Surgeons report on the management of isolated head injury.

Methods: The care pathways taken by patients with an isolated head injury, admitted via A&E, between 26/07/01 and 26/10/01 were compared with the hospital algorithm

Results: 94 patients were admitted with isolated head injury. The management of 56/94 (60%) of patients followed the algorithm, 38/94 (40%) did not and these are detailed in the table.

Conclusions: The algorithm was followed for the majority of patients. Deviations were seen primarily in 2 groups:- 1) patients investigated with CT head scan when this was not recommended, the results of which were all normal. 2) patients admitted for reasons other than head injury observation. Requests for CT head scan in patients with no LOC & GCS 15 should be carefully justified. Algorithm admission criteria for observation do not consider the social circumstances of some patients.

Hunterian lecture

290 MAXILLOFACIAL AND OCULAR INJURIES IN MOTOR VEHICLE CRASHES

C. Brookes. *Address not supplied.*

Injuries from motor vehicle crashes constitute a leading cause of death in the young and a high degree of morbidity and mortality in all age groups. Facial trauma has been consistently shown to be the single most common injury to the occupants of vehicles involved in crashes (*Ann Emerg Med* 1999;**34**(3):384-93).

Grattan and Hobbs demonstrated in their landmark study in 1976 (Rowe NL, Williams JL, eds *Maxillofacial Injuries*. London: Churchill Livingstone, 1985:37-41) a marked overall reduction in facial injuries in belted occupants compared with unbelted casualties. However, drivers wearing seat belts were more likely to experience significantly more severe steering wheel related facial injury than unbelted comparisons.

Other more recent studies (*Am J Emerg Med* 1994;**12**:160-3) have still demonstrated a continuing high incidence of facial fractures amongst belted drivers. Airbags have therefore been advocated as a supplemental restraint system. Airbags though deploy within 50 msec and at 160-320 km/hr. Consequently, they can cause injury, particularly if the driver is of short stature or is unrestrained and out of position within the vehicle. There is also increasing concern that airbag deployment can result in ocular injuries ranging from abrasions to retinal detachments and globe rupture.

The CIREN project (Crash Injury Research Engineering Network) is a collaboration between eight level one trauma centres in North America. Its aims are to correlate the injuries received by occupants in vehicle crashes with the biomechanics of vehicle deformation. As part of an ongoing research project in 1999, I retrospectively evaluated all cases of facial injury which presented to the University of Michigan Medical Centre, USA. Comprehensive clinical records for each index case were reviewed and six of the cases in my study group were found to have sustained serious combined maxillofacial and ocular injuries. A detailed analysis of these cases is presented with particular reference to the methods of restraint used by the occupants involved and to the correlation between the injuries sustained and vehicle deformation. The case analysis identified the vehicle front pillar as a potential source of injury. Analysis also confirmed the value of airbags to the safety of vehicle occupants but reinforced they must still be considered supplemental restraint systems. As such, seatbelts should remain as the primary safety feature of modern vehicles. In the near future, the development of new generation airbags will minimise the risk of injury even to small stature or out of position occupants as they will prevent deployment in situations where they may have an adverse effect.

Workshops

291 A SYSTEMS APPROACH TO MANAGING AGGRESSION AND VIOLENCE: MARTIAL ARTS NOT REQUIRED

A Bleetman. *Accident & Emergency Medicine, Birmingham Heartlands Hospital, UK*

Verbal and physical assaults on staff are a particular problem in emergency departments. They produce negative effects on the health and safety of both the staff and the department. The preventable and non-preventable causes for aggression and violence are discussed.

Staff must be guided in their response to these threats by a lawful and realistic hospital policy. A robust reporting system is mandatory to identify risk and the effectiveness of any initiatives adopted to combat these risks. The effects of security measures and training is monitored in this fashion. Hospitals and emergency departments need to look closely at the patient journey, the environment, the provision of information, customer care and the department's processes to identify and address areas which by themselves provoke and precipitate frustration and aggression.

The average fight between two combatants lasts for seven seconds, staff can rarely afford to wait for police or security guards once trouble has started. Staff can be given skills to allow them to recognise the potential for trouble early on, before actual assault occurs. A trained staff response to aggression and violence must be lawful, and where at all possible ethical.

Staff and hospitals are constrained by laws governing health and safety, use of force, self defence, and human rights. Health and safety law requires hospitals to formulate an appropriate response to any reported threats. Staff must offer a reasonable and lawful response to any threat. Staff can be taught a conflict resolution model to allow them to offer only a 'reasonable' and safe response. This is taught by teaching staff to recognise the level of any threat and the factors which make a situation more or less dangerous. They are then able to select a response from a small menu of communication, movement and physical skills.

Training offered to staff must be monitored and fine-tuned through operational reporting. This process has identified good and effective modern training practice.

Staff are taught:

- a. the ethical and legal framework of staying safe
- b. recognising and avoiding trouble
- c. using the reporting process
- d. tactical communications
- e. stance, movement and positioning skills
- f. physical defensive skills.

Any physical skills taught to staff must be task-related, effective and reflexive. They are made available as an absolute last resort when communication and escape strategies have failed. They allow staff to escape or control an assailant. There is absolutely no use in teaching skills that will not be instantly available or work when required. Staff can be taught a small number of these skills. Some of these skills are described and demonstrated. The place of drugs to assist in restraint is described.

292 ASSESSMENT AND APPRAISAL IN THE WORKPLACE

A McGowan. *Address not supplied*

This workshop is designed for Registrars and Consultants in Accident & Emergency Medicine. It will be interactive and pluripotential. A model for observed clinical practice in the workplace will be discussed and strategies for capturing this information in to annual assessment packages will be explored. Evaluative and developmental appraisal will be discussed and contrasted. At least one model for developmental appraisal will be explored in depth. The inter-relationships between assessment, appraisal, job plan review and revalidation will be discussed. Delegates should leave the workshop with an improved understanding of what assessment and appraisal mean, practical and attainable suggestions for undertaking both in the workplace and better prepared to be themselves both assessed and appraised.

293 NATIONAL ELECTRONIC LIBRARY FOR HEALTH: EMERGENCY CARE

M. Cooke. *Emergency Medicine Research Group, University of Warwick and Walsgrave Hospitals NHS Trust*

The UK government's Information for Health strategy announced the creation of a National electronic Library for Health (NelH). The aims of the NelH are to provide easy access to best current knowledge, to improve health and healthcare, clinical practice & patient choice.

The basic principles underpinning the development of NelH are that it should be obsessed with the quality of knowledge, be concerned with both knowledge and the skills to manage and apply that knowledge, be equally open to patients and clinicians and that it should create and sustain communities of users.

A branch library for emergency care (NelH-EC) has been developed by the Emergency Medicine Research Group based at University of Warwick. It has resources that are of interest and use to all providers of emergency care (e.g. ambulance services, A&E departments, minor injury services). It is currently available on the internet at www.nelh-ec.warwick.ac.uk. Long term, it may even be available in the cab of the ambulance or via your WAP phone. In the initial NelH Strategy Document a patient floor for the library was described, this function is now provided by NHS Direct Online.

NELH-EC has four shelves of the library. The first shelf will provide access to sources of information that are commonly used and useful. This will include electronic textbooks, access to on line services (e.g. Toxbase, UK telephone directory) links to journals and a journal club.

The second shelf will be the resource shelf. This will be a collection of documents such as protocols, training packages, major incident plans, patient information leaflets. Anyone can donate these to the library, so that others can adopt them or modify them for their local use. It is hoped that this resource could save us all a lot of time in writing our department handbooks and similar projects. If you have documents that could be placed in the resource shelf, please let us know.

The third shelf is the guidelines shelf. The evidence based clinical guidelines will eventually give three levels of knowledge

- Quick read guidelines
- Full guidelines with background information
- Access to latest research information, including literature searching capability.

This should allow any healthcare professional to look up the latest treatment at his desk or workstation. These guidelines will have a standard structure and will all have been peer reviewed. This is without doubt the most ambitious part of the project and therefore is likely to be the last component to be completed. The top shelf is the learning shelf. This is for when you are sitting at the PC during a rare quiet spell. One of the elements of this shelf will be an interactive learning zone e.g. trauma moulages, resuscitation scenarios. The idea of this shelf is to have fun whilst learning. A new interface goes on line in summer 2002. This will enable full searching across the library. Over the next year several developments are occurring:

- A guidelines fellow will increase the number of guidelines available and start the quality scoring process
- A new emergency department handbook is planned. This will have the appearance of a traditional handbook but have the advantages of linking to the background resources of NELH
- A collaboration with BAEM's clinical effectiveness committee will mean that as national guidelines are developed they will be stored on NELH and more importantly will appear at the top of the list when searching
- A series of patient information leaflets will be available that will eventually be the basis of a national dataset used by A&E departments, NHS Direct and all emergency care providers
- wide range of patient group directives to allow nurse dispensing of drugs will be available
- user newsletter will be produced and can be subscribed to by visiting the site.

We look forward to hearing your views on the site.

294 GETTING PUBLISHED

P. Driscoll. *Emergency Department, Hope Hospital, Salford M6 8HD*

Editors have clear views on their role in the publication process. They want the limited space available in the paper version of their journals to be filled with important, readable, relevant and honest articles. An important consequence of this is the readership will often site the journal and thereby increase its impact factor. To achieve these goals the editors have to maintain quality. This is partly achieved by minimising the number of "dead weight" papers i.e. articles which are neither cited nor provide key information to the readership. Coupled with this is the pressing need to have accepted articles published as quickly as possible.

Inevitably these driving forces lead to many articles being rejected. The actual percentage varies but can be as high as over 90% in some of the more prestigious journals. The reasons for rejection usually fall into one or more of the following:

- Style – e.g. badly written
- Scientific – e.g. poor methodology
- General – e.g. irrelevant, not new
- Ethics – e.g. consent, conflict of interest

It is true that sensational research is usually accepted, even if it is badly written. However most articles do not fit into this category. Consequently a poor writing style can represent a significant barrier, particularly for the mediocre paper. When the authors compound this problem by not following the journal's guidelines, the fate of the article is usually assured.

The editors do sometimes makes mistakes and there are examples of some very famous articles being rejected. It is therefore not possible to guarantee that a paper will be accepted, no matter how good it is. Nevertheless the following check list should maximise the chances of your article being accepted eventually:

- Choose the most appropriate journal for your article by considering the readership that would find the topic being studied most interesting.
- Read the appropriate guidelines to authors and check these against articles published in the selected journal.
- Write the article and seek input from co-authors and colleges.
- Ideally put the article away for a while and then re-read it. Make appropriate corrections and consider its style. Aim for clarity, brevity and correct punctuation.
- Send a covering letter explaining why the journal should be interested.

Do not give up. Most papers will require revision at the very least. In the end the rejected ones are also often published in other journals provided there is no irredeemable scientific or ethical problem.

295 THE RAPID UPTAKE OF RESEARCH FINDINGS INTO ROUTINE CLINICAL PRACTICE

T. Good. *Accident and Emergency Department, Royal Liverpool University Hospital, Prescot Street, Liverpool L7 8XP*

There is a constant throughput of research showing that the rate of uptake of research findings into routine clinical practice is often too slow or otherwise inadequate. A recent example of this in Emergency Medicine (EM) is the work by Graham et al looking at the uptake of the Ottawa ankle and knee X-ray decision rules.

Initiatives designed to facilitate this appropriate change in practice include continuing medical education in its various guises, evidence based medicine and the associated publications, change management and clinical audit, but the delays continue. Why is this?

We can find an answer by looking at the process of adoption of innovations in general. The recognized steps to the implementation of innovations are; knowledge (of the innovation), persuasion (whether it might be useful), evaluation (a wider assessment), decision (whether to use it), implementation and confirmation (of its use and consequences).

Research will present that indicates that Emergency Physicians have difficulty with a majority of these stages. We can recognise then the need for the process of innovation adoption to be managed holistically to meet with the best chance of sustaining up to date clinical practice.

This workshop will encourage participants to explore the difficulties they experience through each of these stages and then through wider group activity find solutions. Those solutions could include initiatives for Emergency Medicine organisations to help the specialty develop new practices as a whole. It is therefore hoped that it will be of value to Physicians in their own practice as well as policy makers.

Finally, two simple systems will be offered to manage the transfer of research into routine practice, one for the EP in their practice and another through forming a cooperative framework within a small community of EPs.

296 A CRITICAL LOOK AT EVIDENCE BASED MEDICINE

S.W. Goodacre. *Medical Care Research Unit, University of Sheffield, Regent Court, 30 Regent Street, Sheffield, S1 4DA*

The practice of evidence-based medicine (EBM) involves integrating individual clinical expertise with the best available research evidence. It would seem self-evident that a conscientious emergency clinician should follow this doctrine. Yet attempts to institute an evidence based approach may encounter hostility and resistance. In this session we will discuss how and why EBM may carry negative connotations for clinicians, and explore ways of tackling these problems. Examples from emergency medicine will be used.

The practicality of EBM: EBM takes time and resources to learn and practice. Neither are abundant in an emergency department. If it can take a year for a full time researcher to undertake a systematic literature review to answer a clinical question, what is the point in busy clinicians trying to do the same? Shouldn't we just follow what the experts tell us?

The politics of EBM: The self-evident logic of EBM makes it a powerful political weapon. It can be used (or abused) to serve political purposes. How can we identify when EBM is being used in this way and what can we do about it? Conversely, EBM may itself be a victim or beneficiary of the political mood. Could recent political enthusiasm for EBM have been anything to do with a perception that it could be used to reduce health service costs and control the medical profession? And what implications do the rise of consumerism and patient autonomy have for EBM? What happens when patients want care that is not evidence based?

The philosophy behind EBM: Concepts such as the hierarchy of evidence and the value of randomisation are fundamental to EBM. Yet these concepts are not based on any absolute truth. They require the clinician to conform to a particular way of thinking about scientific evidence. This is likely to be appropriate when dealing with a very objective question, such as whether a specific drug reduces mortality from a specific condition, but less appropriate for subjective questions, such as those relating to individuals' beliefs, attitudes or experiences. By valuing objectivity, does EBM ignore the importance of context and the patients' perspective? If a question cannot be answered by a double-blind, randomised controlled trial, is it condemned to never be supported by "good evidence"?

Summary: EBM is a valuable way of improving patient care, but it takes time and resources to practice, it may be used for political ends, and the ideas upon which it is based may have limited applicability to

some important practical questions. Understanding the principals behind EBM is the best way to ensure that EBM serves you and your patients, rather than being your master.

297 RESEARCH METHODS: BEYOND THE RCT

S.W. Goodacre. *Medical Care Research Unit, University of Sheffield, Regent Court, 30 Regent Street, Sheffield, S1 4DA*

Traditional research methods have focussed upon measuring clinical effectiveness, ideally using the randomised controlled trial (RCT). Although clinical effectiveness is a crucial element of emergency care, there are many other aspects that require evaluation. We need to evaluate how changes in service organisation, such as staffing patterns, educational interventions or the use of protocols, effect patient care. We need to measure cost-effectiveness and we need to examine interventions from the patients' perspective. Finally, even when measuring clinical effectiveness we need to be able to manage situations when traditional RCT methods are unfeasible or unethical.

To answer the crucial questions in emergency medicine we need to become familiar with a broad range of methods and collaborate with experts in these areas. The aim of this presentation is to introduce some key concepts, increase awareness of the value of these research methods and highlight the risks of attempting to answer research questions in emergency medicine with inappropriate methods.

Cluster randomised trials: Cluster randomisation means randomising members of staff or periods of time, rather than individual patients. This is often useful to allow randomised evaluation in the emergency setting and to evaluate service-level interventions. However, using standard statistical tests on such data will overestimate the power of such studies and give inaccurate p values and confidence intervals. Recognising when and how to use cluster techniques is an essential skill for researchers in emergency medicine.

Non randomised trials: Randomisation in the emergency setting may be impractical, impossible or unethical. In these circumstances non randomised techniques may be used, but they risk producing results that are biased or confounded unless appropriate steps are taken in trial design and analysis. Understanding the principles behind non randomised trials can make the difference between carrying out a flawed study and a valuable piece of non randomised research.

Cost-effectiveness analysis: Demonstration of cost-effectiveness is now crucial to the implementation of new technologies, yet this involves much more than simply measuring costs and choosing the cheapest option. Concepts such as opportunity cost, economic perspective and incremental cost-effectiveness are often unfamiliar to clinicians, but are vital to understanding and undertaking economic evaluation.

Qualitative techniques: Providing effective emergency care requires understanding of the attitudes, beliefs and perceptions of patients and staff. Observational studies, focus groups & qualitative interviews provide a scientific approach to examining these issues.

Operational research: Organisation of staffing, reducing waiting times, streaming patients and managing bed waits are the kind of perennial problems that emergency medicine research should be helping with. Operational research allows us to model interventions and evaluate new ideas without altering the existing system.

Summary: Health service commissioners are increasingly relying on the findings of researchers from these disciplines. If emergency practitioners wish to influence the development of their speciality a better understanding of the strengths and weaknesses of these methods is essential.

298 HIGH LEVEL SIMULATORS IN EMERGENCY DEPARTMENT EDUCATION

G. Lloyd, N. Nichol, L. McGugan. *Address not supplied*

This presentation will cover three areas:

1 An introduction to simulators: What the mannequins can and cannot simulate; the educational advantages to using them; the differences between currently available mannequins.

2 Current use: Trainer and trainee evaluation of educational courses (including those covering rapid sequence induction, medical emergencies, trauma, paediatric emergencies, transport of the critically ill and crisis resource management); the international perspective.

3 The future: Forthcoming mannequin upgrades; the simulator as an assessment tool; a structured trainees' education programme.