Abstracts

The Faculty of Accident & Emergency Medicine Tenth Anniversary Meeting, 13–15 November 2003, Royal College of Surgeons of England, London, WC2A 3PE
Roderick Little prize session

001 THE REDUCTION OF DISLOCATED HIP PROSTHESES IN THE EMERGENCY DEPARTMENT USING CONSCIOUS SEDATION: A PROSPECTIVE STUDY

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Objective: To determine the overall success rate of reduction of dislocated hip prostheses using conscious intravenous sedation in the Emergency Department. To determine the success rate for specific subgroups of these patients and the overall complication rate.

Design: A prospective observational study.

Population: All consecutive adult patients presenting to the Accident and Emergency Department of a District General Hospital from August 2000 to February 2003 with an isolated unilateral dislocation of a prosthetic hip.

Intervention: Attempted reduction of the dislocated hip prosthesis using conscious sedation.

Outcome measures: 1) Overall success rate of attempted reductions. 2) Overall complication rate of the sedation or procedure. 3) Success rate for 3 specific subgroups of patients.

Results: 101 patients were analysed. The overall success rate was 62% (95% CIs 53–71%). There were only 6 complications: 5 related to oversedation of the patient and 1 was a mild foot drop as a result of the procedure. Success rate for first dislocations was 50% (95% CIs 34–66%) compared with 69% (95% CIs 57–79%) for those with recurrent dislocations. The success rate was 82% (95% CIs 52–95%) for grade A dislocations, 54% for grade B (95% CIs 41–66%) and 69% for grade C (95% CIs 53–82%). For those patients presenting within <4 hours the success rate was 65% (95% CIs 54–74%), within 4–8 hours 57% (95% CIs 33–79%) and only 25% (95% CIs 5–70%) for those >8 hours. The mean time to attempted reduction of the joint using conscious sedation was 1.8 hours and for an equivalent group who were excluded and went on to have a general anaesthetic the mean time was 10.9 hours.

Conclusions: Attempted reduction of isolated unilateral prosthetic hip dislocation using conscious intravenous sedation in the emergency department is safe and has a reasonable success rate. Attempted prosthetic hip reduction can be performed more quickly using conscious sedation than awaiting general anaesthesia.

002 MANAGEMENT OF ANKLE SPRAINS: A RANDOMISED CONTROLLED TRIAL OF THE TREATMENT OF INVERSION INJURIES USING AN ELASTIC SUPPORT BANDAGE OR AN AIRCAST® ANKLE BRACE

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Objective: Lateral ligament ankle sprains are the most common single sports injury. The aim of this study was to determine the functional outcome of the ankle joint following a moderate or severe inversion injury, comparing standard treatment with an elastic support bandage against an Aircast® ankle brace.

Design: Prospective, randomised controlled trial.

Setting: Two centre study accident & emergency departments.

Method: 50 patients presenting consecutively were randomised into two equal groups and allocated an elastic support bandage or an Aircast ankle brace. All patients were given a standardised advice sheet referring to rest, ice, compression and elevation. Review arrangements were made for 48–72 hours, 10 days and one month.

Primary outcome measure: Ankle joint function was assessed at 10 days and one month using the modified Karlsson scoring method (maximum score 90).

Secondary outcome measure: The difference in ankle girth (swelling) and pain score at 10 days.

Results: 17 patients completed the study in the elastic support bandage group (6 defaulted and 2 were excluded). 18 patients completed the study in the Aircast ankle brace group (6 defaulted, 1 was excluded). There was no statistical difference between the two groups in terms of age (mean: elastic 33.5 years, Aircast 32.6 years), sex, dominant leg, left or right ankle injured, previous injury, or time to presentation (median hours: elastic 3, Aircast 4). Differences in ankle girth (median 20 mm) and pain scores (median 6) were similar in the two groups at presentation. Using Student's t-test, the Karlsson score was significantly higher in the Aircast group compared with the elastic group at day 10 (mean 50 vs 35, $p=0.028$, 95% CI 1.7–27.7) and at 1 month (mean 68 vs 55, $p=0.029$, 95% CI 1.4–24.8). There was no difference between the groups in the secondary outcome measures (swelling, $p=0.09$; pain, $p=0.07$). Using hierarchical multiple regression analysis to correct for possible baseline confounding factors, the Aircast group was associated with significantly higher Karlsson scores at day 10 ($p=0.009$) and one month ($p=0.024$).

Conclusion: Using an Aircast ankle brace in the treatment of lateral ligament ankle sprains produces a significant improvement in ankle joint function at both 10 days and one month compared with standard management with an elastic support bandage.

003 THE CARDIORESPIRATORY EFFECTS OF PHYSICAL RESTRAINT: DOES SIZE MATTER

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Introduction: A small number of people die each year during restraint situations. Such events occur in police custody, during paramedic transport and in emergency departments. Case series suggest that individuals with an increased BMI are at increased risk of restraint associated death. Excessive exertion up until the point of collapse is also a feature of these deaths. This study aims to compare the cardiorespiratory effects of prone restraint in subjects with a BMI <25 kg/m^2 to the effects in a group of subjects with a BMI $\geqslant 25$ kg/m^2. Both groups will be maximally fatigued by exercise.

Methods: A randomised cross over experimental study. 32 subjects (16 BMI $\geqslant 25$ kg/m^2) underwent maximal exercise on a cycle ergometer. Post-exercise subjects were randomised to a seated position or the prone restraint position with handcuffs securing the wrists behind the back. Primary outcome measures were pulmonary function testing at 5 minutes.

Results: Pre-exercise there was no difference in pulmonary function between groups. Exercise had no effect on pulmonary function in the seated group; however, in the restrained group post-exercise pulmonary function fell significantly (pre-exercise unrestrained FEV_1 4.28 (SD 0.7) v post-exercise restrained FEV_1 3.7 (SD 0.7) ($p=0.002$). There was no difference in pulmonary function between the non-obese and subjects with BMI $\geqslant 25$ kg/m^2 group at any stage.

Conclusion: Prone restraint positioning leads to a fall in pulmonary function when combined with maximal exercise. Subjects with an increased BMI did not show any further detriment.

004 THE EFFECT OF HYPERTONIC SALINE DEXTRAN (RESCUEFLOW) ON WHOLE BLOOD COAGULATION

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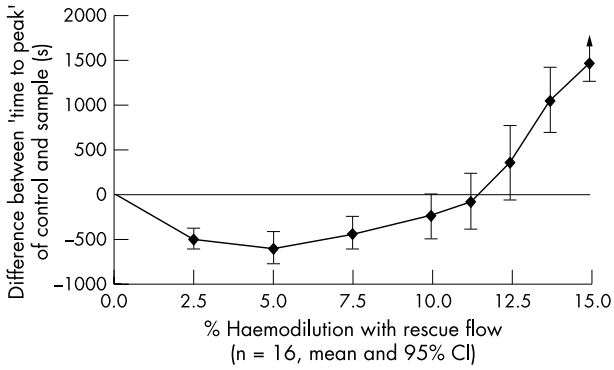
Introduction: RescueFlow is a recently licensed resuscitation fluid composed of 7.5% hypertonic saline and 6% dextran 70, which is being promoted for 'small volume' resuscitation in patients with trauma and haemorrhagic shock, especially the subset with associated head injury.

Methods: Blood from 16 human volunteers was taken through a free-flowing intravenous cannula and diluted with hypertonic saline dextran in steps of 2.5% over a physiologically realistic range of 0% (control) to 15%. Whole blood thromboelastograms (Sonoclot profiles) were



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obtained for each sample. The time to achieve maximum clot strength or 'time to peak', which occurs normally at about 700 seconds, was measured for each dilution.

Results: At each dilution, the mean and 95% CI of the differences from control were calculated. Values below the baseline signify a pro-coagulant effect and ones above an anticoagulant effect.

Conclusions: The standard dose of 4 ml/kg of RescueFlow gives a 9% dilution in a patient with grade 4 shock. This therapeutic dose is close to the dilution at which we have found an adverse effect on coagulation. If the weight is overestimated or the patient is obese, coagulation may be impaired. Until further research is done on the use of this resuscitation fluid in trauma patients, a second dose (as recommended in American military protocols) should not be given.

005 CLINICAL IMPLICATIONS OF THE CURRENT AND NEW UK GUIDELINES GOVERNING THE MANAGEMENT OF CHILDHOOD HEAD INJURIES WHEN APPLIED TO A COHORT OF 10,965 PAEDIATRIC PATIENTS

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Introduction: Worldwide, there are now several contrasting clinical decision guidelines governing the management of minor head injuries in children. Each guideline has considerable impact on resource allocation for the safe treatment of these patients. The most recent UK guidelines issued are from NICE and these are expected to be adhered to throughout accident and emergency departments in the UK from June 2003.

Objectives: This study aims to determine the clinical implications of the new NICE guidelines in the management of childhood head injuries and to compare these with the previously published Royal College of Surgeons guidelines.

Methods: A prospective cohort study was undertaken of children under the age of 16 years, with all severity of head injury at Manchester Royal Infirmary, Stepping Hill Hospital and Alder Hey Hospital. A proforma was used to collect data on 40 clinical correlates. A total of 10,965 patients were enrolled into the study over two and half years. Having established the clinical correlates relevant to each set of guidelines, the number of skull radiographs, CT scans, and hospital admissions was determined under the NICE guidelines, the Royal College Surgeons guidelines and current practice.

Results: Current practice from the enlisted hospitals led to 2746 (25%) skull x-rays and 94 (0.9%) CT scans being performed and 409 (3.7%) hospital admissions. Full implementation of the Royal College of Surgeons guidelines would have meant 5519 (50.3%) skull x-rays and 171(1.6%) CT scans being performed and 775 (7.1%) hospital admissions. Under the NICE guidelines 30 (2.7%) skull x-rays, 957 (8.7%) CT scans would be performed, with 151 (1.4%) hospital admissions.

Conclusions: The results of this study demonstrate that the NICE guidelines would result in a significant reduction in the number of skull x-rays and in the number of hospital admissions. There would also be an increase in the number of CT scans performed.

006 THE EMERGENCY DEPARTMENT CLINICAL UTILITY OF BEDSIDE RESPIRATORY DEAD SPACE ANALYSIS AND IL-TEST D-DIMER, IN THE INVESTIGATION OF PULMONARY EMBOLISM (THE MIOPED STUDY—THE MANCHESTER INVESTIGATION OF PULMONARY EMBOLISM DIAGNOSIS)

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Introduction: Investigation of pulmonary embolism (PE) is complex and time consuming. Pleuritic chest pain accounts for 1% of emergency presentations to Manchester Royal Infirmary. The emergency department must decide who should undergo further investigation. We hypothesised that the addition of a second bedside test to the D-dimer would increase its specificity.

Aim: To investigate the clinical utility of combined respiratory dead space analysis and IL-Test D-dimer in ruling out pulmonary embolism at the emergency bedside.

Method: Consecutive patients with pleuritic chest pain presenting to Manchester Royal Infirmary's emergency department were prospectively recruited. A researcher (blinded to all results) performed bedside respiratory dead space analysis. This involved a simple 10 minute breathing test. All patients had an IL-Test D-dimer and a clinical probability score (modified Wells score). Those at low clinical probability with a normal D-dimer were discharged to home. All others followed a protocol of reference standard investigations to establish the presence or absence of pulmonary embolism, using PIOPED interpreted ventilation–perfusion scanning, CT pulmonary angiogram and pulmonary angiography. All patients were followed up clinically for 3 months.

Result: From February 2002 until May 2003, 791 patients were assessed. 425 were recruited, 93 declined and 273 were excluded. 45 patients were excluded from analysis as they did not correctly complete the reference standard investigations or essential data was missing. If either alveolar dead space or D-dimer was negative, the tests were considered negative for PE. Calculated sensitivity was 95% (95% CI 85.4–100), specificity 69.4% (65.4–73.3) and negative likelihood ratio 0.07.

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	Pulmonary embolism	
Test result	**Diagnosed**	**Ruled out**
Dead space analysis and D-dimer positive	**19**	**110**
Either test negative	**1**	**250**

Conclusion: Use of respiratory dead space in addition to D-dimer would result in a 33.6% reduction in patients requiring VQ or CT (193 patients reduced to 130).

Scientific presentations: group 1

007 CLINICAL PREDICTORS OF ACUTE CORONARY SYNDROME IN PATIENTS WITH UNDIFFERENTIATED CHEST PAIN

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Background: Patients with acute, undifferentiated chest pain present a frequent diagnostic challenge to clinicians. Clinical features are often used to determine which patients have an acute coronary syndrome (ACS).

Aims: To identify clinical features that are independent predictors of ACS among patients with acute, undifferentiated chest pain.

Design: Prospective study of a cohort of patients enrolled in a randomised controlled trial.

Methods: The presenting characteristics of participants in the ESCAPE randomised trial of chest pain unit versus routine care were recorded in a standardised manner. Follow-up consisted of troponin T measurement at two days, postal questionnaire at one month, and telephone contact at six months. ACS was defined as elevated troponin T at two days or major adverse cardiac event within 30 days of presentation. Multivariate analysis identified independent clinical predictors of ACS.

Results: ACS was diagnosed in 77 (7.9%) of the 972 patients recruited. The following characteristics were independent predictors of ACS (odds ratio, p-value): age (1.09, $p<0.001$), male gender (8.6, $p<0.001$), indigestion or burning type pain (3.0, $p=0.034$), pain radiation to the left (2.4, $p=0.013$) or right (5.7, $p<0.001$) arm, vomiting (3.5, $p=0.007$), and previous (5.1, $p<0.001$) or current (3.7, $p<0.001$) smoking.

Conclusion: In addition to previously recognised predictors of ACS, it appears that indigestion or burning type pain predicts ACS in patients attending the emergency department with acute, undifferentiated chest pain. Diagnosis of acute ''gastro-oesophageal'' chest pain should be avoided in this setting.

008 HOW USEFUL ARE CLINICAL FEATURES IN PATIENTS WITH SUDDEN ONSET SEVERE HEADACHE?

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Background: The patient presenting with sudden onset severe headache is a challenging problem in the emergency department (ED). In all such patients the possibility of intracranial haemorrhage (ICH) should be considered. This study aimed to determine features in the history or examination that predict which patients will be found to have ICH.

Methods: Data were collected prospectively on consecutive, alert, adult patients presenting to a UK ED with sudden onset severe headache Patients underwent investigations at the direction of the treating physician, having unenhanced head CT and lumbar puncture where appropriate. The final diagnosis was taken to be that made in the ED for discharged patients or the discharge diagnosis for those patients who were admitted to hospital. Patients were followed up for three months.

Results: 158 patients were included in the study. 100 patients underwent head CT. This demonstrated subarachnoid haemorrhage (SAH) in 15 cases and 3 intraparenchymal haemorrhages. 38 patients in whom CT was normal underwent lumbar puncture which demonstrated SAH in one case and viral meningitis in another, giving a total of 19 (12%) patients with ICH. Univariate logistic regression showed the presence of vomiting, abnormal tone, abnormal coordination and abnormal plantar reflexes to be predictive of ICH. These features were subsequently entered into a multivariate logistic regression model and those found not to be independent predictors removed stepwise from the model. Vomiting and abnormal coordination were shown to be significant independent predictors of ICH. The results of this model are shown below.

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Feature	p	Odds ratio	95% CI Lower	95% CI Upper	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Vomiting	0.01	8.1	1.8	37.6	78.9	59.0	20.8	95.3
Coordination	0.01	21.7	2.2	211.0	10.5	97.6	40.0	87.9

Conclusion: There is a significant incidence of ICH in alert patients presenting to the ED with sudden onset severe headache. Whilst certain clinical features may help to identify those patients who are at greatest risk, no features have been identified that can rule out the need for investigation.

009 APPROPRIATENESS OF CLINICAL DECISION MAKING WITHIN A PARAMEDIC PRACTITIONER INTERMEDIATE CARE SUPPORT SCHEME FOR OLDER PEOPLE WITH MINOR CONDITIONS

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Background: An increasing number of older people living in the community require emergency care. Many of these emergencies will be due to minor injuries or falls. The current response of transporting such patients to a busy emergency department (ED) may not be the best way of managing these individuals. Seven Paramedic Practitioners have been trained in Sheffield to nurse practitioner level to assess and treat older people who call 999 with minor acute conditions in their home.

This study aims to evaluate the appropriateness of the clinical decisions made by the Paramedic Practitioners.

Methods: Review of all notes of patients seen through the Paramedic Practitioner scheme will evaluate the number of patients seen, range of presenting complaints and diagnoses made. In addition, the method of disposal and subsequent unplanned hospital attendances in the 28 days following the initial episode will be checked through the hospital database. Of those unplanned attendances that relate to the initial episode, reason for attendance will be documented and a decision about the appropriateness of management during the initial care episode made by 2 independent ED clinicians blind to the final diagnosis and outcome.

Results: 720 older patients were seen during the first 6 months of the scheme. Patient ages ranged from 60 to 102 years and the majority were female (75%). Most of the calls originated from the patient's home or a relative's home (72%). The most frequently presented diagnostic categories were wound (29%) and fracture (27%). Around a fifth (18%) of patients required no further referral after treatment by the practitioner. Fewer than half of patients were referred to the ED (42%). To date there have been 3 adverse (0.4%) events, but no adverse patient outcomes. Results will be presented on the appropriateness of decisions made to leave patients in their home based on subsequent related unplanned hospital attendances.

010 A RANDOMISED STUDY TO EVALUATE THE IMPACT OF A PRE-HOSPITAL ECG ON 'CALL TO NEEDLE' TIMES IN PATIENTS SUFFERING AN ACUTE MYOCARDIAL INFARCTION

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Objective: To determine the impact of introducing a prehospital 12 lead ECG on the 'call to needle' time for patients with acute myocardial infarction (AMI).

Setting: Urban ambulance service working with 2 large city centre emergency departments.

Background: AMI is a medical emergency in which rapid thrombolysis has been proven to be an efficacious treatment. Developing systems to allow rapid thrombolysis is a significant challenge facing emergency medicine in the UK. Various methods have been advocated to reduce such delays. This study evaluates one such measure.

Method: Patients were randomised on the basis of day of the week to 2 arms – an intervention arm in which a pre-hospital 12 lead ECG was recorded and the paramedic's interpretation of the ECG relayed to the receiving hospital and a control arm who received standard care which did not include a 12 lead ECG.

Outcome measures: Call to needle time for both groups.

Results: 430 patients with chest pain were randomised. Of these 83 had ECG changes diagnostic of AMI and received thrombolysis in the EDs (39 patients in the intervention arm, 44 controls). Patients in the intervention arm demonstrated shorter call to needle times (mean 67 minutes v 79 minutes, p=0.16), largely due to a reduction in the door to needle (mean 20 minutes v 34 p=0.115) component of the patient journey.

Conclusion: Introduction of a prehospital 12 lead ECG to a city centre emergency service reduces call to needle times, although this study lacked sufficient power to demonstrate a statistically significant difference. A short training programme for paramedics is sufficient to run such a system.

011 PATIENT AND GENERAL PRACTITIONER SATISFACTION WITH EMERGENCY CARE: ARE THEY RELATED?

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Background: Patient satisfaction with care is an important indicator of quality of emergency care that is increasingly used in evaluation. General practitioner (GP) satisfaction with care is less frequently measured, but may also be an important indicator of quality. We aimed to measure patient and GP satisfaction in a trial of chest pain unit (CPU) versus routine care and to determine whether GP satisfaction was predicted by patient satisfaction.

Methods: A CPU was established at the Northern General Hospital and then randomly allocated to be open on 221 of the 442 days of the trial. Patients attending the emergency department with acute, undifferentiated chest pain were recruited and followed up at two days and one month after attendance. All patients were given a self-complete patient satisfaction questionnaire at two days (N=972). For days 171 to 442 of the trial, the patient's GP was sent a self-complete GP satisfaction questionnaire (N=601). Multilevel, random effects modelling was used to determine whether CPU care was associated with improved patient and GP satisfaction, and whether patient satisfaction predicted GP satisfaction for three questions relating to satisfaction with diagnosis, treatment and overall care.

Results: Patients attending when the CPU was open reported significantly higher scores on all patient satisfaction questions. There was no significant difference between the groups on any GP satisfaction question. Patient satisfaction did not predict GP satisfaction in relation to diagnosis ($p = 0.456$), treatment ($p = 0.256$) or overall care ($p = 0.085$).

Conclusion: CPU care is associated with improvements in all dimensions of patient satisfaction, but not GP satisfaction. Patient satisfaction did not predict GP satisfaction with emergency care.

012 IMPACT OF AN EDUCATIONAL STRATEGY FOR PARAMEDICS IN DIAGNOSING ACUTE MYOCARDIAL INFARCTION IN THE PACE STUDY

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Context: The PACE (Paramedic Assessment of Cardiac Emergencies) study is a randomised controlled trial to evaluate the role of a pre-hospital ECG in patients suffering acute chest pain in the Leeds metropolitan area who are then transported to hospital for evaluation.

Objective: This study aimed to evaluate the impact of a dedicated training course for paramedics to interpret a 12 lead ECG prior to arrival at hospital. Diagnostic accuracy to diagnose acute myocardial infarction (AMI) was assessed and anomalies are described.

Methods: Over a 16 month period, patients in Leeds with symptoms consistent with cardiac chest pain who had an ambulance called were randomised to have a 12 lead ECG or a 3 lead ECG as standard. Paramedic diagnosis was recorded onto a dedicated proforma prior to arrival at hospital.

Results: 437 patients were entered into the study. 228 patients were randomised to have a 12 lead ECG and 208 patients had 3 lead monitoring alone. Of these, 93 patients suffered AMI in the study group (67% male, 33% female). Pre-hospital data for interpretation revealed sensitivity for diagnosing AMI as 92% and specificity 85%. The positive predictive value (PPV) was 68% and negative predictive value (NPV) 97%.

Conclusions: A pre-hospital ECG with paramedic interpretation alone is insufficient to accurately diagnose AMI. Specific areas of targeted education may improve performance. Alternative support systems such as telemetry should also be considered to help aid decision making for future pre-hospital thrombolysis programmes.

Scientific presentations: group 2

013 IS THE 'LEMON' METHOD A USEFUL EMERGENCY AIRWAY ASSESSMENT TOOL?

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Objective: To assess whether the 'LEMON' method, devised by the developers of the US National Emergency Airway Management Course, is a useful and practical airway assessment tool in patients undergoing treatment in the emergency department resuscitation room.

Methods: 100 patients treated in the resuscitation room of a UK teaching hospital between June 2002 and January 2003 were assessed on criteria based on the 'LEMON' method.

Results: All 7 criteria based on the 'Look' section of the method could be adequately assessed. Data for the 'Evaluate' section could not be obtained in 10 patients, with inter-incisor distance being the most problematic. 'Mallampatti' score was unavailable in 43 patients and had to be assessed in the supine position in 32 of the remaining 57. Assessment for airway 'Obstruction' and 'Neck mobility' could be performed in all patients.

Conclusions: The 'Look', 'Obstruction' and 'Neck mobility' components of the 'LEMON' method are the easiest to assess in patients undergoing treatment in the emergency department resuscitation room. The 'Evaluate' and 'Mallampatti' components are less suited to the specialist population that present to the resuscitation room, as assessment of these is more problematic and more prone to inaccuracy.

We suggest that the 'LEMON' airway assessment method should be revised to include less emphasis on the 'Evaluate' and 'Mallampatti' criteria in order that it may be more suited to a resuscitation room population and slightly less time consuming to perform.

014 EVALUATION OF THE WHO CRITERIA FOR IDENTIFYING PATIENTS WITH SEVERE ACUTE RESPIRATORY SYNDROME (SARS) PNEUMONIA OUT OF HOSPITAL: PROSPECTIVE OBSERVATIONAL STUDY

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Objective: To investigate the discriminatory clinical and radiological features of severe acute respiratory syndrome (SARS) and to evaluate the sensitivity of WHO guidelines for identifying SARS.

Design: Prospective study.

Setting: Emergency department screening clinic of a university hospital in the new territories of Hong Kong.

Participants: 556 patients.

Main outcome measure: The presence of SARS pneumonia.

Results: Of 556 subjects who attended the screening clinic, 141 were admitted to hospital and 97 had suspected SARS pneumonia. The proportion of patients with fever, chills, malaise, myalgia, rigor, loss of appetite, vomiting, diarrhoea and neck pain were significantly different in the SARS pneumonia and non-SARS pneumonia groups. Upper and lower respiratory tract symptoms were not strong discriminators of patients with and without SARS pneumonia. The overall accuracy of WHO guidelines for identifying patients with suspected SARS pneumonia is 83% with negative predictive value of 85% (95% CI 83%–89%). The sensitivity and specificity are 26% and 96%, respectively.

Conclusions: Current WHO guidelines for screening subjects for suspected SARS may not be sufficiently sensitive in the assessment of cases prior to admission. Daily follow up, documentation of non-respiratory, systemic symptoms and chest X-ray may be more appropriate.

015 A PROSPECTIVE VALIDATION OF THE CANADIAN CT HEAD RULES IN THE UK EMERGENCY DEPARTMENT

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Background: Clinical decision rules are being increasingly used for the management of common conditions in the emergency department (ED). In 2001 the Canadian CT Head Rule was published by Stiel *et al* for the management of minor head injuries following blunt trauma. These rules are likely to be adopted by the National Institute of Clinical Excellence—an evidence based standard template for best practice in UK EDs.

Retrospective analyses of patients with minor head injuries have already been performed in the UK, showing that the Canadian CT Head Rule increases the need for CT scanning.

We performed a prospective UK validation of the Canadian CT Head Rule for all patients with minor head injuries presenting to the ED of the Northern General Hospital in Sheffield between February and August 2003.

Method: Patients presenting to the ED following blunt head trauma were identified and a proforma completed by the managing doctor to document type of injury, investigations performed and disposal. We also asked each doctor to theoretically apply the Canadian CT Head Rule to each patient to evaluate its impact on their management.

We analysed rates of CT scanning and the subsequent financial burden for acute trusts. Patient notes were reviewed at two months to document subsequent related health care resource use. The main outcome measures were significant pathological changes on CT scan or neurosurgery.

Results: Analysis to date reveals that 1250 patients have presented with head injuries of all types (February to June 2003). Of the data so far collected, 329 patients fit the criteria for the Canadian CT Head Rule. Of these 236 had a skull x-ray, and 42 underwent a CT scan. Implications for change in the management of this group when applying the Rule will be presented.

016 THE PREVALENCE OF COCAINE-ASSOCIATED CHEST PAIN IN A LONDON HOSPITAL

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Objectives: To determine the prevalence of cocaine misuse in patients presenting to an Accident and Emergency department with chest pain.

Design: An anonymous prospective hospital based prevalence study.
Setting: The emergency department of a central London teaching hospital.
Participants: All patients 18 years and above attending the accident and emergency department with chest pain.
Intervention: Over an 8-week period, urine from patients presenting with chest pain was anonymously tested for cocaine and metabolites by a lateral slide immunoassay. Using an unlinked data collection method, case notes of patients with chest pain from the same period were also reviewed.
Outcomes: The presence of cocaine or its metabolites in the urine of patients presenting with chest pain was the primary outcome measure.
Results: Of 496 patients presenting with chest pain, 411 (83%) were tested for cocaine, and 49 (9.9%) of test results were positive. The mean age of patients presenting with chest pain was 50 years (SD 18.65). The number of subjects testing positive for cocaine differed in various age groups: 18–30 years, 28%; 31–40 years, 30%; 41–50 years, 3%; and 50–99 years, 0%. The oldest patient testing positive for cocaine was aged 44 years. A review of accident and emergency records showed that 12.7 % of patients had been questioned about illicit drug use, 11% of whom admitted cocaine use before attending. Thus, 1.4 % of total chest pain patients gave a history of preceding cocaine use.
Conclusion: Cocaine contributes markedly to the incidence of chest pain in young people presenting to this emergency department. Providing ethical considerations can be solved, all patients under 40 presenting with chest pain should have a urine test, as cocaine-induced chest pain requires specific management.

017 A RANDOMISED TRIAL OF THE EFFECT OF GELOFUSINE AND SALINE ON COAGULATION AFTER INJURY

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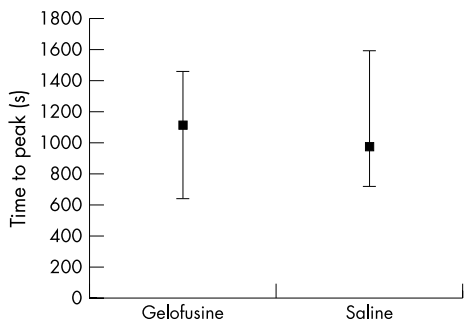
Introduction: Gelofusine has been shown to impair coagulation *in vitro* and in human volunteers. This trial was performed to investigate whether the type of resuscitation fluid made a significant difference to coagulation after injury.
Methods: Forty traumatised patients were randomised to receive either 1000 ml of Gelofusine or 1000 ml of 0.9% saline as their first (pre-hospital) resuscitation fluid. This was followed by 0.9% saline resuscitation as clinically required. A Sonoclot profile (thromboelastograph) was taken on arrival in the emergency department and the time to achieve maximum clot strength or 'time to peak' was measured. This is normally measured at about 700 seconds.
Results: 'Time to peak' was greatly increased in both groups, with a large variation between patients. There was no significant difference in 'time to peak' between the groups. Twenty eight (70%) of the patients had an abnormal coagulation profile on arrival in the emergency department. The mean and interquartile range for each solution are shown in the figure.
Conclusions: The type of the first 1000 ml of resuscitation fluid given did not have a measurable effect on coagulation. Other factors have a larger influence on coagulation following injury than the type of resuscitation fluid. Whole blood coagulation analyses showed that a surprisingly large proportion of injured patients have an abnormal thromboelastogram—the clinical significance of this observation is not yet known.



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018 RANDOMISED DOUBLE BLIND TRIAL COMPARING ORAL PARACETAMOL AND ORAL NON-STEROIDAL ANTI-INFLAMMATORY DRUGS FOR TREATING PAIN AFTER MUSCULOSKELETAL INJURY

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Objectives: To investigate the efficacy and safety of oral paracetamol compared with oral non-steroidal inflammatory drugs (NSAIDs) or combination therapy in relieving pain after blunt limb injury in an emergency department.
Design: Double blind, randomised, controlled study.
Setting: Emergency department of a university hospital in the New Territories of Hong Kong.
Subjects: 300 adult patients with painful isolated limb injuries
Main outcome measures: Primary outcome measures were pain relief at rest and with limb movement, adverse events and patient satisfaction.
Results: There was no statistical difference in the mean reduction in pain score between any of the combinations at any time point although combination therapy was the first to reach a clinically significant reduction in pain score (<13 mm) and NSAID/paracetamol combinations consistently produced a greater reduction in mean pain score than either NSAID or paracetamol alone. All combinations appeared to be safe although more patients receiving the diclofenac/paracetamol combination complained of abdominal pain. The median patient satisfaction scores were poor, suggesting that analgesic regimens were ineffective.
Conclusion: In the doses, frequencies and routes of administration used for this study, any analgesic benefit of oral paracetamol/NSAID combinations over single NSAID or paracetamol treatment is small and of doubtful clinical significance. NSAIDs, paracetamol and NSAID/paracetamol combinations appeared equally safe in the management of musculoskeletal pain.

Moderated poster session 1: emergency systems

019 DO ACCIDENT AND EMERGENCY DOCTORS ADMIT MORE PATIENTS THAN PHYSICIANS?

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Objectives: To compare the patterns of admission between doctors in accident and emergency (A&E) and those in general medicine, after the introduction of a new admissions system for medical patients in A&E.
Methods: A prospective audit was carried out, gathering data as to source of referral, speciality seen, and disposal of patients before and after the introduction of a new admitting system. The new system allowed A&E doctors direct admitting rights to the medical receiving unit.
Results: There was an increase in both attendances and admissions between the audit periods.
A&E doctors were found to discharge a higher proportion of medical patients seen than physicians, regardless of referral source ($p<0.001$).
The disposal of patients by consultant physician review following admission was unaffected by the introduction of the new system ($p=0.725$).
Conclusions: Accident and emergency doctors admit a smaller proportion of the medical patients that they see, particularly from GP/deputising services.
Subsequent review by consultant physicians did not indicate a rise in inappropriate medical admissions.
A&E doctors are as suitable to decide whether a medical patient merits admission as a physician.

020 CAN TRIAGE NURSES PREDICT ADMISSION?

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Introduction: Most A&E departments currently request a bed after examination by the admitting team and therefore only at that time in the process is the search for a bed commenced.

The aim of this study is to determine whether the triage nurse can reliably predict the subsequent admission or discharge of a patient.

Methods: All patients attending an emergency assessment unit during a 1 week period had triage assessment (Manchester Triage System) as well as a scoring by the triage nurse of their possible need for admission. A score of 1 being the triage nurse believing that the patient would definitely need admission to 5 where the triage nurse believes the patient would definitely be discharged.

The admission prediction score and triage category was then compared to the actual disposal of the patient from the emergency assessment unit.

Results: 488 patients presented; 247 (50.6%) had full triage and admission prediction data, of which 175 were admitted (70.9 %). An admission prediction score of 1 had a positive predictive value (PPV) of 0.83 and a negative predictive value (NPV) of 0.44. If a score of 1 or 2 were combined, the PPV fell to 0.75 and the NPV increased to 0.56.

A score of 5 had a PPV of 0.8 and an NPV of 0.66. Combining scores 4 and 5, the PPV is 0.71 and NPV was 0.28.

The triage category and admission prediction score were then combined for further analysis. Combining the admission score of 1 or 2 and a triage score of 1 or 2 had a positive predictive value of 0.86.

Conclusion: Triage prediction combined with triage score will only correctly predict three quarters of admissions.

021 IS A REFERRAL SYSTEM FROM THE AMBULANCE SERVICE TO SPECIALIST DIABETES NURSES FOR PATIENTS WITH HYPOGLYCAEMIC DIABETIC EPISODES APPROPRIATE?

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Introduction: Patients with diabetes experiencing acute hypoglycaemia are a common reason for emergency calls to the ambulance service. Most of these patients are treated effectively by crews, without transfer to A&E.

The National Service Framework for Diabetes has stated; ''The NHS will develop, implement and monitor agreed protocols for rapid and effective treatment of diabetic emergencies by appropriately trained health care professionals. Protocols will include the management of acute complications and procedures to minimise the risk of recurrence.''

This pilot study assessed the effectiveness of ambulance crew referral for diabetic patients who had treatment for acute hypoglycaemia to a dedicated specialist nurse led team. These patients were assessed by the ambulance service and did not attend A&E. Patients' satisfaction with the service was also examined.

Methods: For a 3 month period, patients within the criteria were referred from two areas of West Yorkshire. A diabetes nurse specialist contacted the patient within seven days and arranged review. Satisfaction questionnaires were sent to patients.

Results: 38 patients were referred and reviewed. Warning signs of hypoglycaemia were identified by 19 patients, but 17 had none and 2 had incomplete data.

12 patients had a self-treated episode in the last 6 months, 9 patients had three or more.

15 patients had called an emergency ambulance for similar reasons in the previous 6 months (27 ''999'' calls).

20 patients had their treatment altered, 14 patients required ongoing review.

26 patients returned the satisfaction questionnaire, 88% agreed or strongly agreed that they had improved their understanding of hypoglycaemia and 73% felt more able to treat a hypoglycaemic episode in the future.

Conclusions: The ambulance service can coordinate successful referral of patients with episodes of hypoglycaemia to a specialist nurse led diabetes service.

Patients valued this service and felt more confident managing their diabetes.

Recommendations: A funded ambulance service/specialist diabetes nurse liaison referral service should be considered by those coordinating the management of diabetes patients in primary and pre-hospital care.

022 WYMAS HEALTHCARE RESPONSE PILOT—A MOBILE DIAGNOSTIC AND TREATMENT SERVICE

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Introduction: In an attempt to provide alternatives to standard ambulance dispatch and transfer to hospital, various models have been tried, particularly to address those 999 calls which do not require immediate transfer to hospital, but may require early medical input.

Methods: The WYMAS healthcare response (HCR) pilot scheme was conducted to determine whether a dedicated treatment and diagnostic unit, staffed by a suitably qualified doctor and a paramedic or technician would be effective in reducing accident and emergency transfers of 999 patients by treating selected patients in their own homes.

Patients were identified by one of four methods: AMPDS code identification of call priority, referrals to the HCR doctor by ambulance crews on scene with 999 patients, direct referral by the intermediate care team and call screening to identify potentially appropriate calls.

Results: The unit attended 181 patients over 116 days. Overall, 82.1% of patients were treated at home, and of the four methods, patients identified by ambulance crews on scene were most likely to be treated at home and avoid hospital transfer (92%).

The AMPDS system was not found to be a reliable predictor of need for hospital admission. 29.3% of patients identified by a designated ''category C'' AMPDS code were referred to hospital following HCR doctor assessment.

60% of patients were over 65 years old, and one sixth were referred to the intermediate care team for follow-up. 53.6% of patients required planned follow-up by an agency other than A&E, most frequently the patient's own general practitioner.

Apart from dispensing or prescription of medication, the commonest treatment intervention was wound closure with tissue adhesive or sterile strips. Point of care testing of blood was performed on 15 occasions; an abnormality requiring immediate attention was identified on only one occasion. The facility for onboard radiology was developed during the pilot period but not implemented owing to the short time-scale, 11 patients would have potentially benefited from this investigation.

Patient satisfaction with the service was high. However, job satisfaction of the HCR team was hampered by the low caseload during the pilot and the relatively minor nature of the majority of calls.

Conclusions: Future service development should look at ways of increasing call uptake without compromising patient safety and review both case mix and staff skill mix. One way of achieving this would be to integrate the service with other emergency care work streams.

023 DISCREPANCY RATE BETWEEN PREDICTED CAUSE OF DEATH AND POST-MORTEM CAUSE OF DEATH IN AN ACCIDENT AND EMERGENCY SETTING

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Objective: To establish the discrepancy rate between the predicted cause of death and the actual cause of death as determined by the post-mortem (PM) result, for all deaths in the accident and emergency (A&E) department which were reported to the procurator fiscal (PF).

Methods: A prospective study of all patients who were dead on arrival or died in the A&E department of a busy Glasgow hospital over an eleven month period. Either the doctor completing the case notes or the most senior doctor present during the resuscitation phase determined the cause of death. This was then compared to the actual PM cause of death and was either considered to be correct or incorrect.

Results: 128 deaths occurred in the department during the study period.

Age range was 26 days to 99 years (mean 48 years).

In 71 (55.4%) deaths, after discussion with the GP±PF, death certificates were issued. Of the remaining 57 (44.6%) patients, 2 (1.6%) had a 'view and grant' and 55 (43%) had a PM.

Of the 55 patients undergoing PM, 8 (14.6%) were related to trauma. The anticipated cause of death was correct all 8 times.

In 3 (5.4%) deaths, it was unclear whether trauma was or was not the cause of death. In 1 (1.9%) of these cases, the cause of death was predicted incorrectly.

In 44 (80.0%) cases, death was attributed to non-trauma. Of these, 24 (43.6%) deaths were incorrectly identified. Ischaemic heart disease and drug overdose were found to be the most common and most accurately predicted cause of death. Intra-cranial events, pulmonary thromboembolism and airway obstruction were also commonly predicted but were often wrong.

Conclusions: This study highlights that it remains a difficult task to accurately identify the cause of death for patients who die suddenly. Not an unusual occurrence in an A&E setting. This could have implications for the accuracy of health service statistics generated from death certificates.

024 THE PREDICTION OF DISABILITY FOLLOWING INJURY

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Introduction: Predictive modelling of outcome after injury is widely used as a method of focussing trauma audit, using lived/died as an endpoint. However, from a patient perspective, disability is also an important outcome. This study was designed to see if current injury scoring systems could predict disability as well as death.

Methods: Anatomical injury severity (AIS scores by body area, physiological injury severity (the variables used in the RTS) and patient age were used as the input variable to an artificial neural network (ANN). A genetic algorithm was used to select the optimum input variables for the final model. The Glasgow Outcome Score (GOS) was used as the outcome variable. The optimum configuration of ANN was determined using a data set of 1100 trauma patients, 80% in training and 20% in validation sets. The performance of the ANN tested was on a new set of data (97 patients), which had not been used in the training process.

Results: The predictive model can exactly predict GOS in 41% of patients and can predict in 80% of patients with one GOS group as shown in the table.

In the optimum model, the variables used were age, GCS, systolic BP, heart rate, ISS, AIS head, AIS chest, and AIS external.

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Predicted outcome (GOS)	Actual outcome (GOS)				
	1	2	3	4	5
1	26	0	0	0	1
2	6	0	1	0	8
3	1	1	0	1	4
4	5	0	0	2	29
5	0	0	0	0	12

Conclusions: A predictive model of disability following injury has not previously been developed. 20% of patients fall more than one GOS category away from the predicted outcome. This predictive model might give an alternative way of focusing audit of outcome following injury, so that unexpected disability (defined as more than one GOS category away from predicted disability) could be examined, as well as unexpected death.

025 ERROR REPORTING IN THE EMERGENCY DEPARTMENT. OBSTACLES TO REPORTING AND STRATEGIES TO IMPROVE THE PROCESS

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Objective: To investigate the incidence of reported and unreported adverse incidents (errors) within the emergency department (ED), reasons for non-reporting and suggested solutions to improve the process that would be acceptable to staff.

Design and setting: A semi-structured face-to-face interview with medical and nursing staff from the EDs of two large teaching hospitals in the UK.

Main outcome measures: Errors were categorised according to type and severity. Reasons for non-reporting incidents were recorded. Opinions on possible changes to the current reporting system were also recorded.

Results: 79 staff members (34 doctors and 45 nurses) were interviewed. 34 (43%) had reported incidents during the 6 month period. 62 (79%) recalled incidents that they did not report. Significant differences existed between medical and nursing staff in both rates of reporting (24% v. 58%, $p<0.005$) and non-reporting (100% v. 64%, $p<0.002$).

Reported and unreported incidents differed in the proportion of severe incidents (82% v. 59%, $p<0.001$), but there were similar numbers of severe incidents (28 v. 30). The incidents also differed by type; unreported incidents contained increased percentages of drug and patient management errors (86% v. 41%, $p<0.007$).

Doctors considered lack of education about incident reporting systems to be more important than the significance of the event ($p<0.01$) for non-reporting. Nurses believed the significance of the event more important than a lack of education ($p<0.005$).

Senior staff were more in favour of changes to the reporting system, particularly the introduction of anonymous reporting ($p<0.04$).

Conclusions: A significant numbers of adverse incidents in the ED, identified as errors, go unreported by nursing and more often medical staff. They differ in severity and type from those that are reported. There is strong support for changes to the adverse incident-reporting process, but without changes to education, this may have minimal impact.

026 AN IMPACT STUDY OF THE NATIONAL INSTITUTE FOR CLINICAL EXCELLENCE (NICE) HEAD INJURY GUIDELINES: A ONE MONTH PILOT IN A DISTRICT GENERAL HOSPITAL

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Introduction: The NICE head injury (HI) guidelines mark a change in emphasis from the use of skull radiographs (SXR) as a triage tool, to the use of computed tomography (CT) as a definitive diagnostic tool. It is predicted that the introduction of these guidelines will increase the use of CT in HI between two- and ten-fold. This has significant resource implications, as an SXR costs £36.00 and a CT head scan £109.00 (NHS provider-to-provider radiology tariff, 2002).

Objective: To assess the resource impact of NICE HI guidelines in a district general hospital.

Methods: The NICE HI guidelines (final draft) were implemented at North Tyneside General Hospital for the period 1st to 31st May 2003 in agreement with the accident and emergency (A&E), radiology and regional neurosurgical departments. Data were captured prospectively by the attending A&E doctor who recorded the investigation indicated by old guidelines and the actual investigation performed using NICE guidelines. To ensure capture of all patients with HI, A&E cards for the study period were reviewed and correlated with radiology records.

Results: 5127 new patients attended the department during the study period. Of these, 351 (6.85%) had a diagnosis of HI. The numbers requiring investigation are shown in table 1.

Abstract 26: table 1

Investigation	Old guidelines	NICE guidelines
SXR	85	**2**
CT	18	**33**
None	248	**316**

The timing of CT is as listed in table 2.

Abstract 26: table 2

Time periods (hours)	Old guidelines	New guidelines
08.00–16.59	8	**15**
17.00–23.59	9	**14**
00.00–07.59	1	**4**

Conclusion: During the study period, the NICE HI guidelines reduced the number of SXRs by 83 (saving £2988.00) whilst increasing the number of CTs by 15 (additional cost £1635.00). This study suggests that concern about the guidelines should not be resource based but should centre on clinical issues such as timing of certain scans and on the increased radiation dose in the younger population.

027 USE OF THE ''CANADIAN C-SPINE RULE'' BY NURSES AS A DECISION TOOL FOR CERVICAL SPINE IMMOBILISATION IN ALERT STABLE TRAUMA PATIENTS

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Background: Potential cervical spine injuries in alert and stable patients are a common presentation to emergency departments. Cervical spine injuries are rare. Many of these patients are unnecessarily immobilised, often for long periods of time. The 'Canadian C-Spine Rule' is a validated clinical decision rule originally designed to allow clinicians to be more selective in the use of imaging in this group of patients.

Objectives: The objectives of this ongoing study which commenced in May 2003 are:

- To determine the potential of the 'Canadian C-Spine Rule' used by nurses to reduce the number of patients unnecessarily immobilised.
- To compare the use of the 'Canadian C-Spine Rule' by doctors and nurses

Setting: A teaching hospital emergency department (ED) with an annual attendance in excess of 120,000 new patients.

Methods: A prospective cohort study of alert stable patients presenting with acute blunt trauma to the head and neck. Nurses, trained to use the 'Canadian C-Spine Rule', assess eligible patients on their arrival in the ED. They complete data sheets classifying the need for immobilisation according to the rule. Patients continue to be immobilised according to current departmental practice. Doctors, blinded to the nurse decision, subsequently complete a second data sheet for each patient.

Statistics: The McNemar test was applied to evaluate the reduction in immobilisation. Inter-observer agreement between doctors and nurses was measured by calculating the kappa coefficient.

Results: To date, 61 patients have been enrolled in the study. None have had a significant cervical spine injury. Use of the 'Canadian C-Spine Rule' would have decreased the immobilisation rate in the ED by 37.4% ($p<0.05$).

The majority of nurses (>80%) were 'very comfortable' or 'comfortable' using the rule.

Inter-observer agreement for the 'Canadian C-Spine Rule' between doctors and nurses was 'fair'.

Conclusion: The 'Canadian C-Spine Rule' used by nurses has the potential to decrease significantly the neck immobilisation rate in patients presenting to emergency departments following acute, blunt trauma to the head and neck.

There was some variation between doctors and nurses in their use of the rule. In this paper, we will discuss inter-observer differences for the individual component variables of the rule.

Moderated poster session 2: medical emergencies

028 SHOULD DIFFERENTIAL WHITE CELL COUNTS BE REPORTED AS PERCENTAGES OR ABSOLUTE COUNTS IN PATIENTS WITH SEVERE ACUTE RESPIRATORY SYNDROME?

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Background: Severe acute respiratory syndrome (SARS) is associated with a lymphopenia, thrombocytopenia and neutrophilia and suspected cases may be admitted to hospital on the basis of such abnormalities. Laboratories may report changes as percentages or absolute counts.

Objective: To investigate whether absolute or percentage differential counts were more predictive of patients with SARS pneumonia.

Design: Prospective observational study.

Setting: SARS clinic of an emergency department, Hong Kong.

Subjects and methods: Whole blood and differential counts were performed on 506 patients presenting to a SARS screening clinic. 96 patients subsequently developed SARS pneumonia.

Results: 69 patients had abnormal absolute counts on first attendance at clinic, of whom 37 (54%) developed SARS pneumonia, compared with 142 subjects with abnormal percentage lymphocyte values, of whom 50 (35%) developed SARS pneumonia. The area under the ROC curve for absolute lymphocyte counts is 0.851 (95% CI 0.816 to 0.881) and for percentage lymphocytes is 0.736 (95% CI 0.694 to 0.775). The area under the ROC curve for absolute monocyte counts is 0.535 (95% CI 0.489 to 0.580) and for percentage monocytes is 0.635 (95% CI 0.591 to 0.678). The area under the ROC curve for absolute neutrophil counts is 0.591 (95% CI 0.546 to 0.636) and for percentage neutrophils is 0.703 (95% CI 0.660 to 0.744).

Conclusion: Reporting absolute rather than percentage values for differential leucocyte counts is a more accurate predictor of SARS pneumonia.

029 THE UTILITY OF A STROKE RECOGNITION INSTRUMENT FOR RAPID TRIAGE OF ACUTE STROKE PATIENTS IN THE ACCIDENT AND EMERGENCY DEPARTMENT

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Introduction: Rapid and timely intervention is crucial for stroke patients to maximise the benefit of acute treatment. Accident and emergency (A&E) departments are frequently the first point of contact with medical staff for acute stroke patients. Despite the recognised need to treat stroke urgently, management of stroke in the A&E setting is generally given a low priority and diagnostic accuracy is unsatisfactory. We designed a stroke recognition tool for use by A&E physicians.

Methods: The study comprised two phases. Phase one was a prospective observational study over one year, during which the instrument was developed using data regarding the clinical characteristics of suspected stroke patients admitted via our A&E. Phase two consisted of a prospective validation study using the instrument in a new cohort of patients admitted via A&E over a 5 month period.

Results: In the Phase 1 study, 398 suspected stroke patients were evaluated (159 strokes; 178 non-strokes; 61 TIAs). Commonest stroke mimics were seizures (24%), syncope (23%) and sepsis (10%)—the '*three S*'. A 7-item scoring system (total score between −2 and 5) stroke recognition instrument was constructed based on history items (loss of consciousness and convulsive fits) and neurological signs (face, arm, leg paresis, dysphasia/dysarthria, and visual field defect). When internally validated at a cut-off score of >0 the instrument showed a diagnostic sensitivity of 92%, specificity of 86%, positive predictive value (PPV) of 85% and negative predictive value (NPV) of 93%. External validation (Phase 2 of the study) against 79 consecutive suspected stroke referrals (49 stroke, 30 non-stroke patients) revealed 88% sensitivity, 73% specificity, 84% PPV and 79% NPV.

Conclusions: This stroke recognition instrument proved to be a useful clinical tool for the recognition of patients with acute stroke in the A&E setting. This could facilitate rapid delivery of thrombolysis and other hyper-acute interventions to acute stroke patients presenting to A&E departments.

030 PROGNOSTIC USE OF CIRCULATING PLASMA *β-GLOBIN* GENE CONCENTRATIONS IN PATIENTS WITH ACUTE STROKE

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Background: Unlike for patients with acute coronary syndrome, at present there is no simple, accurate blood test that may be used to determine the severity of stroke or to predict mortality and morbidity in stroke patients presenting to emergency departments.

Methods: Patients with stroke-like symptoms who presented to an emergency department of a university hospital in Hong Kong were recruited to the study. DNA extracted from patients' plasma was analysed for the *β-globin* gene with a fluorescent-based polymerase chain reaction test. The primary outcome measures were in-hospital and six-month mortality and morbidity using the post-stroke Modified Rankin Score.

Results: Among the 88 consecutive patients recruited to the study, 70 (80%) had ischaemic stroke, 11 (13%) had intracerebral haemorrhage, and 7 (8%) had transient ischaemic attacks. Median plasma DNA levels were higher in patients who died compared with those who survived at discharge (2126 versus 1008 kilogenome-equivalents per litre, P=0.0016) and at six months (1979 versus 1004 kilogenome-equivalents per litre, P=0.0003). Plasma DNA levels correlated with volume of cerebral haematoma (r=0.664; P=0.0276). Plasma DNA concentration of >1400 kilogenome-equivalents per litre yielded a sensitivity of 100% and a specificity of 74.4% for predicting hospital mortality after stroke and the area under the Receiver Operator Characteristic curve was 0.888 (95% CI 0.803–0.945). The adjusted odds ratios for plasma DNA levels predicting six-month mortality was 1.585 (95% CI 1.052–2.389; P=0.03) and for predicting six month post-Rankin score >2 was 1.819 (95% CI 1.000–3.312; P=0.05).

Conclusion: Plasma DNA levels correlate with stroke severity and may be used to predict mortality and morbidity in the emergency room.

031 A STUDY TO EXAMINE THE FEASIBILITY OF THROMBOLYSIS OF PATIENTS WITH CVA IN THE ACCIDENT AND EMERGENCY SETTING

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Aim of presentation: To show feasibility of providing equality of resuscitation assessment training to rural and remote areas of the west of Scotland using video conferencing.

Summary of work: Immediate life support courses have been shown to be a successful way of training multidisciplinary health care professionals in the provision of first responder resuscitation skills. Often remote practitioners find it difficult to travel to attend resuscitation courses. It has been shown that resuscitation skills deteriorate over 6–12 months. Also it has been noted that in rural areas resuscitation skills are likely to deteriorate more rapidly, meaning ironically those who are less likely to be able to access training are the ones who most need regular updates. This study examines the ability of videoconferencing to allow assessment of resuscitation skills at a distant site. The advantages of bringing resuscitation training to the remote and rural practitioner is discussed.

Summary of results: Using videoconferencing, we showed feasibility of assessment of practical skills from a distance with 100% inter-instructor concordance. The skills we were able to assess were basic life support, advanced airway skills, defibrillation, rhythm recognition and cardiac arrest team leadership skills. To provide a quantitative assessment tool, both instructors filled out the ALS course assessment templates. These were filled out separately without any prior discussion between instructors. Both instructors and candidates evaluated the experience, and all felt that this was an acceptable and non-intrusive way of assessing resuscitation skills.

Conclusions: Videoconferencing is an exciting, acceptable and feasible way of allowing assessment of basic and advanced life support skills in less accessible areas.

032 IMPROVED THROMBOLYSIS TIMES FOLLOWING ESTABLISHMENT OF EMERGENCY DEPARTMENT THROMBOLYSIS

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Objective: To identify any change in door to needle (DTN) time by moving the site of thrombolysis delivery from the coronary care unit (CCU) to the emergency department (ED). To ascertain if moving the site of thrombolysis enables safe and effective use of thrombolysis.

Methods: *Design* Prospective observational study. *Setting* CCU and ED of a 450 bed Scottish district general hospital without on-site primary angioplasty. *Participants* The primary site for thrombolysis of patients presenting to the hospital with AMI was moved from CCU to ED on 1 April 2000. Study patients who had a confirmed AMI or who had thrombolytic therapy prior to this date were defined as the CCU group; those who were diagnosed as AMI or had thrombolytic therapy after this date were defined as the ED group. Data were collected prospectively for all patients. *Statistical analysis* Due to non-normal distribution of data, the Mann-Whitney U test was used to compare medians.

Results: 1297 patients were discharged from CCU with a diagnosis of AMI or received thrombolysis in the ED or CCU between April 1998 and April 2002. There were 638 patients in the CCU group and 659 patients in the ED group. Median DTN time for the CCU group (321 thrombolysed patients) was 64 minutes and median DTN time for the ED group (323 thrombolysed patients) was 35 minutes, a median difference of 25 minutes (95% CI for difference 20–29 minutes, $p<0.0001$, Mann-Whitney U test). 37 patients were thrombolysed but did not have an AMI. Further analyses of inappropriate administration of thrombolytic therapy and a blinded comparison of treatment decisions by two independent specialists are in progress.

Conclusion: Thrombolysis in the ED can be delivered safely by emergency physicians. A significant reduction in DTN times accompanied this change in practice in this hospital.

033 THE POTENTIAL IMPACT OF INTERVENTIONS TO REDUCE TIMES TO THROMBOLYSIS

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Background: Delays in the administration of thrombolysis to patients suffering acute myocardial infarction (AMI) are an important cause of avoidable mortality. A number of interventions have been suggested to reduce delays, but formal evaluation is often impractical. We aimed to use modelling techniques to estimate the potential impact of interventions designed to reduce times to thrombolysis.

Methods: A prospective, observational study of all patients transported to hospital by ambulance who subsequently received thrombolysis (N = 1147) was undertaken at twenty hospitals and two ambulance services in Victoria, Australia. Regression models estimated the association between predictor variables (age, gender, route of referral, symptom onset-to-call time, ambulance pre-notification of the receiving hospital, emergency department thrombolysis) and the outcome (time to thrombolysis). Further modelling then estimated the number needed to treat to save one life by several suggested interventions to reduce time delays.

Results: Presentation via a rural hospital or general practitioner was associated with an approximate doubling of the onset-to-call time (2.08 and 2.30 respectively). Ambulance-hospital pre-notification and emergency department thrombolysis reduced door-to-needle times by 21% and 27%, respectively. Modelling showed that each of the following interventions would be expected to save one life: 1069 hospital pre-notifications, 714 cases of emergency department thrombolysis, 184 cases of prehospital thrombolysis, 340 cases to bypass their rural hospital, or 50 cases to bypass their general practitioner.

Conclusion: Hospital pre-notification and emergency department thrombolysis reduce time delays, although the mortality impact appears to be modest. Prehospital thrombolysis has the potential to save lives, although validation in real practice is required. Advising patients to call directly for an ambulance, rather than the general practitioner, has the greatest potential to save lives.

034 PROSPECTIVE OBSERVATIONAL COHORT STUDY OF THE TIME SAVED BY PARAMEDIC DELIVERED PRE-HOSPITAL THROMBOLYSIS FOR ST ELEVATION MYOCARDIAL INFARCTION

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Objectives: To evaluate a system of paramedic delivered, pre-hospital thrombolysis in meeting the National Service Framework targets for the management of acute myocardial infarction.

Design: Prospective observational cohort study comparing patients with suspected acute myocardial infarction considered for thrombolysis in the pre-hospital environment with those treated in hospital.

Setting: The catchment area of a large teaching hospital including urban, and rural areas.

Participants: 201 patients who presented concurrently over a 12 month period with electrocardiogram changes diagnostic of acute myocardial infarction or who received thrombolysis for suspected acute myocardial infarction.

Main outcome measures: Call-to-needle time, number of patients given thrombolysis appropriately and all cause in-hospital mortality.

Results: The median time from first medical contact to initiation of thrombolysis for patients treated pre-hospital (n = 28) was 52 minutes (95% CI 41.41–61.50). Patients from similar rural areas treated in hospital (n = 43) had a median time of 125 minutes (95% CI 104.27–140.15). This represents a median time saved of 73 minutes ($p<0.001$). 60 minutes after medical contact, 64% (18 patients) treated pre-hospital had received thrombolysis; this compares with 4% (2 patients) in a cohort from similar areas. Median call-to-needle time for patients from urban areas (n = 107) was 80 minutes (95% CI 77.67–93.36). Myocardial infarction was confirmed in 89% (25 patients) thrombolysed pre-hospital; this compares with 92% (138 patients) in the in-hospital thrombolysis group.

Conclusions: Paramedic delivered thrombolysis with hospital support can meet the national targets for early thrombolysis. The system has been shown to work well and can be introduced without delay.

035 QUALITY ASSURING THE PROCESS—PRE-HOSPITAL THERAPEUTIC INTERVENTIONS IN PATIENTS RECRUITED TO THE PACE STUDY

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Background: The PACE (Prehospital Assessment of Cardiac Emergencies) study, a prospective randomised control trial, reviewed

the impact of prehospital 12 lead electrocardiograms carried out by trained paramedics in the management of acute non traumatic chest pain. This study describes the quality assurance programme for the patients recruited, with particular focus on therapeutic interventions performed.

Objectives: To describe the individual treatments given to patients with potential and actual acute coronary syndromes (ACS) by pre-hospital personnel in the study population and compare them to standards set by West Yorkshire Metropolitan Ambulance Service (WYMAS).

Methods: The PACE study was a prospective randomised control trial carried out over an 18 month period. For the purpose of this study, patients were divided into two groups. Group A = patients who were randomised to have a pre-hospital ECG performed. Group B = patients who were randomised not to have a pre-hospital ECG performed. WYMAS policy advocates that patients with probable ACS should receive aspirin, nitrate and opioid based analgesia to control symptoms.

Results: In total, 436 patients were enrolled into the study. There were 228 patients in Group A and 208 in group B. 70.1% patients in group A as compared to 67.1% in group B received aspirin. In Group A, 58.3% received nitrates and 28.2% patients received opiate based analgesia; in Group B 57.6% and 26.4% received opiates and nitrates, respectively. Patients with a diagnosis of acute myocardial infarction received 71.1% and 45.3% of nitrates and opiates, respectively.

Conclusion: Pre-hospital personnel maintained standards set for management of patients with possible ACS following the addition of another pre-hospital intervention. Patients with a diagnosis of acute myocardial infarction in the prehospital setting received 18.9% and 13.5% increased administration of opiate based analgesia and nitrate preparations.

036 UNSTABLE ANGINA PRESENTING TO THE EMERGENCY DEPARTMENT. IS IT APPROPRIATE FOR CHEST PAIN NURSES TO REFER THESE PATIENTS FOR INPATIENT STAY?

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Background: Unstable angina is a common presenting complaint of patients attending the emergency department (ED). Traditional practice dictates that although patients require hospital admission, they will wait in busy EDs for the next available doctor to make inpatient referral. By April 2004, 100% of patients will need to be seen and referred within 4 hours. The aim of this study is to investigate the potential to improve patient care by adopting a nurse led service to manage patients presenting to the ED with an episode of unstable angina.

Method: ED chest pain nurses undertook a period of intensive training in clinical history taking and examination to enable them to manage and refer patients to medical inpatient teams. Retrospective analysis of current practice was performed by reviewing ED records for April 2003. Outcomes measured were time to doctor, time to referral and total departmental time. Comparison was then made by ED chest pain nurses during August 2003.

Results: Retrospective data analysis of current practice showed that of 386 chest pain attendances, 62 patients (16.1%) were admitted with unstable angina. The average time to see a doctor was 1 hour 51 minutes, average referral time was 2 hours 21 minutes and transfer to bed was 4 hours 42 minutes. Of the 62 patients, 52 (83.5%) had a discharge diagnosis of angina, unstable angina or NSTEMI. Data will be presented on chest pain nurse performance and compared to standard practice to identify any improvement in service.

037 THROMBOLYSIS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AND LEFT BUNDLE BRANCH BLOCK; RECONCILING CONFLICTING APPROACHES AND SIMPLIFYING TREATMENT DECISIONS

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Introduction: Left bundle branch block (LBBB), whilst an ECG feature suggestive of acute MI (when new) and thus an indication for thrombolytic therapy, continues to cause difficulties for junior staff when deciding to thrombolyse a patient. Protocols for the management of such patients range from thrombolysis of all patients, thrombolysis of none of them or thrombolysis of some of them based on certain validated ECG criteria. An algorithm has been published based on these criteria, with the intention of simplifying the analysis of acute MI in the presence of LBBB to assist in thrombolysis decisions. Local audit has shown that there remains a reluctance to thrombolyse.

We undertook to design a simple guide to improve interpretation of ECGs showing LBBB and compared its reliability to the current algorithm.

Method: 17 ECGs demonstrating LBBB, 6 of which were taken from patients subsequently demonstrated to have had an acute MI (based on enzyme analysis), were presented to junior and middle grade doctors in the department. Half the doctors were given the current algorithm to aid their interpretation and the other half the redesigned proforma. Two weeks later, the exercise was repeated with each group using the alternative method.

Results: Using the current algorithm as a test demonstrated it to have a sensitivity of 0.38. With the new proforma, sensitivity rose to 0.6. Specificity for myocardial infarction rose from 0.85 to 0.96. Analysis of inter-observer variation using kappa methodology demonstrated that levels of agreement rose from poor to good.

Conclusion: Patients with acute MI and LBBB have been shown to have a significantly poorer outcome than those without LBBB; despite this, thrombolysis is less likely to be given to patients with MI and LBBB. This study demonstrates that in part this is due to cognitive difficulties using the current algorithm. The proposed proforma addresses these issues and provides a simple tool to aid appropriate treatment in this group of patients.

Moderated poster session 3: children, trauma and cleanliness

038 SCREENING FOR MALARIA IN FAMILY MEMBERS OF AFFECTED CHILDREN

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Introduction: In 2001, 1081 cases of malaria were diagnosed in England & Wales, of which 716 were in London and 151 cases were in children aged 0–15 years. In 1983, Simpson *et al* observed that in children diagnosed with malaria, travelling family members had a 1 in 4 chance of also having malaria. We therefore decided to offer screening to other family members once a child is diagnosed to try and find the true incidence in our population.

Method: We collected data from all new cases of childhood malaria attending the Royal London, Homerton and Newham hospitals from August 2002. The index case was assessed, and data was collected regarding region of travel, length of stay, prophylaxis (if any), previous malaria and symptoms. Family members travelling with the child were offered screening, and a questionnaire filled in for each. Samples were tested during normal working hours, using rapid antigen test and blood films.

Results: We saw 16 new cases of childhood malaria between August and October 2002, age 3–16 years. All the children had falciparum parasitaemia levels <1%–3%. Twenty six family members were screened (on average, 1.6 relatives per index case, range 1–4). Four relatives (15%) were found to be positive for falciparum (1 adult, 3 children). The 3 children (75%) were all asymptomatic.

Conclusion: Screening of relatives of children with malaria is simple to carry out, has a high pick up rate, and confers little extra burden on current services. Absence of symptoms does not rule out presence of malaria. We therefore recommend that screening be offered to the family members of affected cases.

039 A PROSPECTIVE STUDY INVESTIGATING POST-TRAUMATIC STRESS IN CHILDREN AND ADOLESCENTS ATTENDING AN EMERGENCY DEPARTMENT FOLLOWING AN ASSAULT OR ROAD TRAFFIC ACCIDENT

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Introduction: Few attempts have been made to understand the role of demographic, trauma-related, and psychosocial factors in the aetiology of chronic PTSD in children and adolescents. Furthermore, the psychiatric impact of events that are more common causes of attendance at emergency departments, such as assaults, have received very little attention in this population. A prospective study was undertaken to examine factors potentially involved in the aetiology of PTSD in children

and adolescents and to compare the prevalence of PTSD across different events.

Method: Children and adolescents aged 10–16 years who attended the emergency department of King's College Hospital, London, following an RTA or non-sexual assault were invited to participate in the study. At 2–4 weeks and 6 months post-trauma, participants were interviewed to test for the presence of acute stress disorder (ASD) and PTSD. Participants also completed self-report questionnaires relating to their levels of PTSD and depressive symptomatology, and their trauma appraisals and cognitive styles.

Results: Levels of post-traumatic stress and depressive symptoms did not differ across trauma types. 19.4% of participants met criteria for ASD at the 2–4 week assessment, and 12.5% met criteria for PTSD at the 6 month follow up. Regression modelling revealed that demographic variables and objective indices of trauma severity (e.g. triage) were not significant predictors of PTSD at 6 months. Subjective indices of trauma severity and cognitive style, in particular the use of a ruminative coping style, were shown to be good predictors of PTSD at 6 months, accounting for 51.1% of variance on a self-report measure of post-traumatic stress.

Conclusions: Children and adolescents who are not seriously injured or admitted are at similar risk of suffering PTSD following an assault or RTA as those who are seriously injured or are admitted. Psychosocial processes are implicated in the aetiology of PTSD in this population.

040 ONE STOP BUCKLE FRACTURE MANAGEMENT

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Introduction: Buckle fractures of the wrist are common paediatric injuries presenting to emergency departments. The risk of displacement of true dorsal buckle fractures is low, as the tension side of the cortex is intact.

Previous studies have shown that home management of these injuries using plaster backslabs or soft casts without a follow up appointment is safe and preferable for parents.[1 2] Another study showed no difference in outcomes using Futura type wrist splints instead of plaster for treatment of these injuries.[3]

These studies involved patients being reviewed in fracture clinic at least once, using significant time in the fracture clinic and causing disruption for children and their parents, who may miss school and be absent from work. Our department operates a one stop algorithm treating low risk buckle fractures in a ''Futura type'' splint, providing an advice sheet and discharging directly from the department without planned follow up. Correct use of the algorithm is confirmed by sending x-rays and notes to the fracture clinic the next day.

Method: Three month cohort study at the Sheffield Children's Hospital, which provides the only paediatric emergency care within the city. Eligible patients were identified by the departmental database for all children discharged home with a wrist fracture. Complications were identified from checking fracture clinic attendances or medical notes for 3 weeks post injury.

Outcomes looked at were number of unplanned reattendances with complications relating to the initial injury.

Results: 54 Patients were discharged over the three month period. Over this time 1 patient reattended within three weeks with a reaction to the splint, which resolved with antihistamines.

Conclusion: This cohort study has demonstrated that isolated buckle fractures of the distal radius can be safely managed using a one stop emergency department algorithm.

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2. **Solan M**, Rees R, Daly K. Current management of torus fractures of the distal radius. *Injury* 2002;**33**:503–5.
3. **Davidson J**, Brown D, Barnes S, *et al.* Simple treatment for torus fractures of the distal radius. *J Bone Joint Surg (Br)* 2001;**83-B**: 1173–5.

041 ALVEOLAR EPITHELIAL REPAIR AFTER ACUTE LUNG INJURY

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Background: Acute lung injury (ALI) represents a common pathophysiological outcome following a range of insults presenting to the emergency room, including severe sepsis, major trauma, and gastric aspiration. Breakdown of the blood–air barrier of the lung with alveolar oedema and an intense inflammatory response characterise the syndrome that carries a mortality of 40–60%. The pattern of subsequent recovery of the alveolar epithelium is known to predict outcome from ALI. Type II alveolar epithelial cells have an important role in this process, enabling re-epithelialisation of the blood–air interface by producing replacement type II and type I cells.

Objective: To investigate alveolar epithelial phenotype changes in a model of resolving lung injury and in cultured epithelial cells.

Methods: Alveolar cell phenotype was studied in frozen lung sections from rat models of bacterial pneumonia and in epithelial cell culture. Analysis was carried out by immunofluorescence using confocal microscopy, and also by electron microscopy. An ELISA-based dot blot assay was used for biochemical analysis.

Results: Analysis revealed marked differences in the phenotypes of the epithelial barrier cells compared to controls. Cells expressing type II cell markers (MMC4 and RTII70) were markedly increased in number. The number of cells expressing the type I cell marker RT140 was significantly reduced, and a population of cells expressing both a type I cell specific protein (RTI40) and a type II cell specific protein (MMC4) was identified. This pattern of co-expression is not observed in control lungs. Similarly, the transition of alveolar epithelial type II to type I-like cells *in vitro* was associated with a population of cells which co-expressed RTI40 and MMC4. Electron microscopy of repairing epithelium revealed cells with morphological characteristics consistent with an 'intermediate' phenotype. Biochemical analysis was consistent with the morphological findings (upregulation of MMC4 and downregulation of RTI40).

Discussion: We have begun to characterise the process of epithelial repair in a clinically relevant model of acute lung injury. We have demonstrated for the first time an alveolar epithelial 'intermediate' cell phenotype in the repairing lung epithelium.

042 THE EARLY COAGULATION AND INFLAMMATORY CHANGES FOLLOWING MAJOR TRAUMA

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Introduction: Trauma is a leading cause of death and disability in the western world. Haemorrhage accounts for many of the early deaths, whereas disseminated intravascular coagulopathy (DIC) and multiple organ dysfunction syndrome (MODS) are common causes of late mortality. Coagulation problems are associated with trauma but are often overlooked. The importance of tissue factor (TF) and the timing and extent of any hypercoagulable state remains poorly understood, as is its relation to the inflammatory response. It is not known if early manipulation of the clotting cascade effects outcome following injury.

Methods: 50 traumatised patients (mean ISS 28) were studied in the immediate five hours following injury. The first sample was taken in the pre-hospital phase within 20–30 minutes. Conventional blood tests (FBC, INR, APTT, TT, d-dimers and fibrinogen) and a thromboelastogram (Sonoclot profile) were measured at each of four time points. A more detailed panel of haematological and inflammatory markers was taken simultaneously and stored. This included tissue factor (TF), thrombin-antithrombin complex (TAT), prothrombin fragments 1.2 (PT1.2), antithrombin (AT3), protein C (PC), tissue factor pathway inhibitor (TFPI), von Willebrand factor (vWF), tissue plasminogen activator (tPA) and plasminogen activator inhibitor 1 (PAI-1). Three cytokines were studied – IL-1, IL-6 and tumour necrosis factor β (TNFβ). Patients were followed up in the ITU and scored for DIC and organ failure.

Results: A hypercoagulable state commonly exists following injury. It occurs within minutes and relates to TF expression. The type and severity of injury dictate the magnitude of TF release and the degree of hypercoagulability. Fibrinogen levels fall early in these patients, but standard coagulation tests do not detect these subtle changes, which contrasts with the thromboelastogram. IL-6 and TNFβ form the basis of the inflammatory response. Levels rise within minutes and are linked to certain injury patterns but appear independent of TF. There is a trend for hypercoagulable patients to develop DIC and MODS.

Conclusions: An awareness of a hypercoagulable state following injury is important. It is easily overlooked with standard coagulation tests, and routine thromboelastograms/fibrinogen levels should be considered. Clinicians should be alert to high-risk patients with injuries that are associated with hypercoagulable states and progression to DIC and MODS. Further work is required in these patients to assess if the earliest manipulation of the clotting cascade decreases the morbidity and mortality associated with trauma.

043 RAPID SEQUENCE INTUBATION: COLLABORATION BETWEEN EMERGENCY MEDICINE AND ANAESTHESIA

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Background: In the UK emergency department (ED), rapid sequence intubation (RSI) is performed by emergency physicians (EP) or anaesthetists. Early analysis of data from Edinburgh revealed that EPs achieved poorer laryngoscopic views with lower 1st attempt success rates and increased complications compared to anaesthetists.

Methods: Data was recorded prospectively on every ED intubation attempt over a 4-year period. Data included indication for intubation, grade/specialty of doctor, physiological status, drugs, laryngoscopic views and complications. Data was analysed using SPSS v9. After initial data analysis, a protocol was agreed between the departments of emergency medicine and anaesthesia to improve supervision and patient care. A senior anaesthetist was contacted for any patient requiring drug assisted intubation. It was agreed that there should be a rapid response to supervise the EP who performed the intubation.

Results: 1252 patients underwent intubation in the ED over a 4-year period. 628 (50%) patients underwent RSI. EPs were the 1st attempt specialty in 65%. Initial analysis (01/99–12/01) showed that the EP group obtained poorer laryngoscopic views (10% versus 5%, $p=0.064$), lower 1st attempt success rate (84% versus 93%, $p=0.011$) and increased complications (15% versus 5%, $p=0.003$) compared to anaesthetists. Post introduction of the protocol, there was increased senior supervision and the EP group achieved better laryngoscopic views and reduced complication rates.

Conclusion: Introduction of a protocol in the ED of a large teaching hospital in Edinburgh has improved senior supervision during RSI. It has led to better identification of difficult patients with improved laryngoscopic views and reduced complications in the EP group. Cooperation and collaboration between the specialties has improved patient care and facilitated continued audit of performance.

044 EMERGENCY RESUSCITATION ROOM PATIENTS—DO THEY REALLY HAVE DIFFICULT AIRWAYS?

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Objectives: To assess whether patients managed in the emergency department resuscitation room are more likely to possess characteristics associated with a difficult airway and intubation.

Methods: 100 patients treated in the resuscitation room and 300 patients treated in the minor injuries area of a UK teaching hospital between June 2002 and January 2003 were assessed on criteria based on the 'LEMON' method.

Results: Patients treated in the emergency department resuscitation room were more likely to be older ($p<0.001$), to have protruding teeth ($p<0.05$), false teeth, large incisors and an abnormal facial shape ($p<0.001$). They were also more likely to have a decreased hyoid to mental distance and reduced neck mobility ($p<0.001$). A difference between the two populations was found in 7 of the 17 variables measured. There was no difference when the number of adverse characteristics per patient in each group was compared ($p=0.89$).

Conclusions: Patients treated in the resuscitation room were more likely to possess characteristics associated with a difficult airway and a difficult intubation. The increased difficulty previously shown with airway management in this group may be attributable to two or three adverse airway characteristics rather than all the criteria assessed as part of the 'LEMON' emergency airway assessment method.

045 HANDWASHING AND ASEPTIC TECHNIQUE IN THE EMERGENCY DEPARTMENT

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Aims: To assess doctors' compliance with good practice in handwashing between patient episodes and asepsis during invasive procedures in the emergency department. To assess the effect of clinical urgency on compliance with good practice in handwashing and asepsis during invasive procedures.

Background: Handwashing and simple aseptic measures before invasive procedures are effective in reducing rates of hospital acquired infection and death. The perceived urgency of a clinical situation in the emergency department may influence medical staff's compliance with good practice in infection control.

Study design: Prospective, single blind, observational study.

Method: Good practice standards for asepsis in invasive procedures and hand washing between patient episodes were compiled from a literature search. Doctors' compliance with these standards was observed in two emergency departments (UK and New Zealand). Observed clinical cases were classified as immediate, urgent and non-urgent based on the triage system.

Results: There was poor compliance with good practice guidelines for asepsis in invasive procedures in both centres. Staff achieved high compliance with the guidelines in only 27% of cases in the UK and 58% of cases in New Zealand. Clinical urgency did not appear to adversely affect compliance with aseptic good practice. Handwashing between patient consultations was very low: 14% in the UK and 12% in New Zealand.

Conclusions: Asepsis and handwashing was poor in both the UK and New Zealand emergency departments. There may be a need for some compromise in standards of asepsis in very sick patients due to the urgency of the clinical situation. Compliance in all situations especially non-urgent procedures needs to be improved.