

Abstracts of the Scientific Symposium on Emergency Medicine Hong Kong, 20-21 October 2006

Free papers Track B3: Nursing

1. COMPARISON OF THE INFECTION RATE OF SUTURED WOUNDS IN ACCIDENT AND EMERGENCY DEPARTMENTS: USING IRRIGATION OR "SWAB & SCRUB" TECHNIQUE IN SURGICAL TOILET

YP Szeto,¹ ML Wong,² KL Ho³

¹Accident & Emergency Department, Yan Chai Hospital;
²Accident & Emergency Department, Princess Margaret Hospital; ³Accident & Emergency Department, Caritas Medical Centre, Hong Kong

Introduction: Wound cleansing is a routine basic skill in nursing care, emphasised in nursing lectures and clinical practice. In accident & emergency departments in Hong Kong, wound "swab & scrub" is a commonly adopted wound cleansing practice, but wound irrigation has been advocated to reduce chronic wound infection rates in recent decades. What is the best technique of surgical toilet for us to choose?

Objectives: The study was to examine the outcomes of irrigation and "swab & scrub" cleansing technique applied on acute traumatic wounds and to identify gaps in skills for decontamination of acute traumatic wounds. We compared the wound infection rate between the two techniques of surgical toilet on acute traumatic wounds suitable for simple suturing. Hopefully it would help to improve the efficiency of acute wound care in the future.

Methods: The study was a prospective randomised controlled trial. It was conducted between 1 March 2006 and 1 May 2006 in the accident and emergency departments of Princess Margaret Hospital and Yan Chai Hospital. All participants with lacerations requiring wound closure were eligible under some inclusion and exclusion criteria. All eligible participants were recruited by the randomisation rule. Coloured chips labelled "irrigation" and "swab & scrub" were put in an opaque box for the eligible participants to pick prior to wound suturing. Group I participants received irrigation and Group II participants received "swab & scrub" in surgical toilet and suturing. Structured, closed-question data collection instruments were completed at the time of wound closure. Participants were evaluated for signs of wound infection (erythema, swelling, tenderness, purulent discharge, or dehiscence) on the day of suture removal by inspection and 3 days after suture removal via phone.

Results: A total of 218 participants were recruited, with

109 in each group (irrigation group and "swab & scrub" group). There was no significant difference in wound infection rate between the two groups ($P=0.308$; 95%CI=-3.31% to 10.55% in ARR), and subgroup analysis (sex, age, wound type, wound location, wound length, wound exposure time and antibiotic usage).

Conclusions: Irrigation and "swab & scrub" have no significant difference in infection rate. The commonly adopted technique – "swab & scrub" – may be more familiar and useful in standardising acute wound toilet in practice.

2. DETERMINING TRIAGE GUIDELINES FOR INTERFACILITY PATIENT TRANSFER

WY Yeung, LLY Lee, SYH Tang, KL Yeung, JTS Chan
Accident & Emergency Department, Alice Ho Miu Ling Nethersole Hospital, Hong Kong

Introduction: Secondary transfer refers to the transfer of patients within a hospital (intra-hospital) or between hospitals (inter-hospital). Nowadays, interfacility patient transfer (IFT) is no longer a minor part of emergency medical service and the transfer of a critical patient to or from the emergency department (ED) is a frequent occurrence. The reasons why patients are transferred can be summarised as follows: (1) the patient's clinical condition requires more specialised care at a higher level centre or service that is unavailable locally; (2) the patient requires service that is available locally but the transferring hospital is temporarily out of beds; and (3) the patient was unstable at the scene and was transported to a nearby lower level hospital for stabilisation. Transfer certainly imposes essential risks for the patients and there is no widely applicable or accepted standard in place for interfacility transfer. Determining triage guidelines for IFT is an important but difficult task because there are difficulties of combining the requirements of a safe transfer with the necessity of a rapid and specialised management.

Objectives: This study was designed to determine if subjective decision on accompanying personnel could result in suboptimal transfer and factors that should be considered in implementing a guideline.

Methods: This was a retrospective review in the ED of Alice Ho Miu Ling Nethersole Hospital. Records for patients who required interfacility transfer over a 12-month period between 1 July 2005 and 30 June 2006 were reviewed. Cases were reviewed for patients' demography, case mix, severity of illness, accompanying personnel and en route adverse events. Clinical progresses during transfer were recorded on

separate transfer forms. Possible en route adverse events were pre-defined as deviation from physiologic parameters throughout the transfer. Appropriateness was determined by 3 factors including (1) requirement of advanced level of interventions, (2) occurrence of physiological instability upon dispatch and (3) the care of mechanical ventilation.

Results: Between 1 July 2005 and 30 June 2006, the total ED attendance were 109,958 and 5,479 of them were transferred to other hospitals, amounting to 5.0%. Among these 5,479 cases, 340 patients (6.2%) were aged less than 12, 3,511 patients (64.1%) were aged 12 to 65 and 1,628 patients (29.7%) were above 65 years old. For destination, 2,327 patients (42.5%) were transferred to the Prince of Wales Hospital, 2,676 patients (48.8%) to North District Hospital, and 476 patients (8.7%) to other hospitals. Regarding severity of illness, 10 cases (0.2%) were in critical condition, 47 cases (0.9%) were seriously ill, 5,291 cases (96.6%) were stable, 77 cases (1.4%) were in satisfactory condition and the remaining were not documented. The indications for transfer included bed unavailability (4.8%) and transfer to tertiary centre for definitive treatment (95.2%). For the 103 cases (1.9%) requiring escort service, 77 (74.8%) were escorted by a nurse-led team and 26 (25.2%) were escorted by a doctor-led team; while 38 cases reported physiological deteriorations and 5 cases reported equipment mishaps.

Conclusions: This retrospective review demonstrated that the occurrence of en route adverse event was not uncommon and the clinical information of these patients was highly variable. A comprehensive guideline is worthwhile to stratify risks of transfer with respect to a number of factors including age, case mix and physiological parameters prior to the transfer.

3.

A PROSPECTIVE COMPARISON OF THREE PREDICTIVE RULES FOR IDENTIFYING HIGH RISK PATIENTS IN EMERGENCY DEPARTMENT RESUSCITATION ROOMS IN HONG KONG

HM Li, MF Ho, GKY Hung, KM Keung, P Mak, CA Graham, TH Rainer

Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Introduction: The emergency department (ED) has always been the gateway and critical part of a hospital. Patients triaged to the resuscitation rooms are in their "golden hour", when immediate treatment would critically affect their outcome. They require objective assessment for life-threatening risks and the need for intensive care unit (ICU) admission.

Objectives: The aim of this study was to compare the prognostic value of two validated predictive methods, Acute Physiology and Chronic Health Evaluation (APACHE II) and Mortality Probability Model (MPM) with a new derived scoring system.

Methods: This was a prospective observational study of 330 [195 men (59%), mean age 61±20] adult patients triaged

to the resuscitation rooms of a Hong Kong university hospital. Patients who died on or before arrival at the ED were excluded. Data records were based on the parameters of APACHE II and MPM scores from 9 April to 6 May 2006. Outcome measures included ICU admission and mortality. **Results:** The overall mortality and ICU admission rates were 12.7% and 12.1% respectively. Receiver Operator Characteristic (ROC) curves of the three predictive rules were compared for composite endpoint (death or ICU admission) as follows: new derived rule: area under the curve 0.909 (95%CI 0.873-0.945) p-value <0.0001; APACHE II: area under the curve 0.733 (95%CI 0.666-0.799) p-value <0.0001; MPM: area under the curve 0.722 (95%CI 0.653 - 0.791) p-value <0.0001. The new derived score from -2 to 58 was developed and divided into two risk groups and tested. The mortality rate of the low risk (score <14) group was 14.0% and the high-risk (score ≥14) group was 85.7% (odds ratio 25.6; 95%CI 12.6-52.2).

Conclusions: The new derived risk stratification model provided an estimation of the likely mortality of resuscitation room patients and of the likelihood of ICU admission. It has shown good potential to be a standard assessment protocol for ED work.

4.

MISCONCEPTIONS IN BASIC LIFE SUPPORT GUIDELINES

PF Lau

Accident & Emergency Department, Pamela Youde Nethersole Eastern Hospital, Hong Kong

Objectives: Updated Basic Life Support (BLS) guidelines have been issued worldwide since December 2005. BLS knowledge has been regarded as basic stuffs that all nurses should have mastered. The author would like to identify current weaknesses or misconceptions on BLS knowledge with an aim to establish effective strategies to introduce the updated BLS guidelines.

Methods: A cross-sectional study using convenient sampling method was conducted during various BLS refresher seminars for nurses from April 2005 to April 2006. Data were collected by using a self-administered questionnaire containing 15 true-or-false questions focusing on major concepts. At the beginning of the seminars, all participants were asked to answer the questionnaire individually and return it before the commencement of the lectures.

Results: Two hundred and sixty-six (N=266) pieces of usable data sheet were returned for data analysis. The majority of them were frontline nurses (Registered Nurse 82.8%, Enrolled Nurse 16.1%, others 1.1%) from acute care (61.5%) and sub-acute care (38.5%) units. With reference to the conventional passing marks (>80%) of BLS classes, high incorrect rates in four concepts, namely, 'clear visible objects in the mouth before opening the airway' (24.1%), 'initial rescue breaths should be delivered fast' (26.3%), 'landmark for chest compression in adults' (22.9%), and 'perform chest compression immediately after the initial rescue breaths' (44.4%) were identified.

Conclusions: The results showed that some nurses had not fully mastered the importance of adopting the BLS sequence. Fellow BLS instructors should make reference to the findings and to clarify misconceptions seriously. To improve the effectiveness of BLS training, instructors might conduct similar studies to accurately assess specific weaknesses so that appropriate strategies for teaching BLS could be tailor-made to meet the need of the target learners.

5.

A SINGLE-BLINDED COMPARATIVE STUDY ON HAIR APPPOSITION TECHNIQUE PERFORMED BETWEEN NURSES AND DOCTORS IN AN EMERGENCY DEPARTMENT (HAT2 STUDY)

J Teo,¹ M Ong,¹ XY Yan,² SH Lim,¹ S Saroja¹

¹Department of Emergency Medicine, Singapore General Hospital; ²Clinical Trials and Epidemiology Research Unit, Singapore

Introduction: Hair Apposition Technique (HAT) is a relatively new technique for treating certain scalp lacerations. It has been shown to be equally acceptable as compared to the standard toilet and suture.

Objectives: The objectives are to compare the effectiveness, complications and benefits of HAT performed by nurses or doctors in a randomised, prospective trial.

Methods: The study was conducted in the emergency department of a large tertiary hospital from November 2002 to February 2005. Subjects were randomised to receive HAT either by doctors or nurses, and the time to complete the wound repair was measured. All wounds were evaluated seven days later for satisfactory wound healing, scarring, and complications.

Results: There were 88 and 76 patients in the doctor and nurse groups respectively. There was no statistical difference in demographics and wound characteristics of both treatment groups. There was no statistical difference comparing outcomes for doctor/nurse groups regarding wound infection (OR 0.81, 95%CI: 0.05, 13.20), scarring (OR 1.26, 95%CI: 0.52, 3.07) and overall complications (OR 1.22, 95%CI: 0.52, 2.89). Mean duration of procedure was 9.01 minutes (SD 5.60 minutes) for doctors and 12.76 minutes (SD 7.47 minutes) for nurses (p value 0.001). There was no significant difference in pain scores for either treatment group (p value 0.83).

Conclusions: Although doctors were faster in performing the procedure, nurses were able to perform HAT without significant difference in complication rates compared to doctors. HAT is a simple technique to learn and can be safely performed by trained nurses.

Free papers

Track C3: Trauma

6.

THE RELATIONSHIP BETWEEN AGE AND SEVERITY OF PEDESTRIAN INJURIES INVOLVED IN MOTOR VEHICLE CRASH IN HONG KONG

TT Wong, KL Tsui

Accident & Emergency Department, Tuen Mun Hospital, Hong Kong

Objectives: In Hong Kong, pedestrian injuries caused by motor vehicle collision accounted for a number of morbidity and mortality in trauma admissions. The aim of this study was to investigate the relationship of age to injury type and severity. Furthermore, we also aimed to describe the epidemiology of pedestrian injuries in Hong Kong.

Methods: This was a retrospective study. Data were retrieved from our own database. All pedestrian injuries involved in motor vehicle collision during the period from January 2004 to December 2004 were examined. We defined three age groups: paediatric (<16 years old), adult (16-64 years old) and elderly (≥65 years old). The variables studied included age, sex, vehicle type and vehicle speed. Injury severity was measured by the Injury Severity Score (ISS), length of hospital stay, outcome (without permanent disability, minor disability, ADL dependent or death) and mortality rate. The result was analysed by logistic regression. The characteristics of the injury pattern in different age groups, the location, action and the special circumstances of the pedestrian were also included in the study.

Results: A total of 542 patients were recruited. The paediatric, adult and elderly groups had 143 (26.4%), 321 (59.2%) and 78 (14.4%) patients respectively. There were 283 female patients (52.2%) whereas male patients accounted for 259 cases (47.8%). Logistic regression analysis showed the elderly age group was a significant independent factor associated with higher ISS score [adjusted OR=3.28, 95%CI 1.67, 6.43] and longer hospital stay [adjusted OR=10.89, 95%CI 2.16, 54.78], with the other confounding factors, including sex, vehicle type and vehicle speed, adjusted accordingly. The elderly group also showed higher mortality rate [6.76%, p<0.0001] and higher ADL dependent status upon discharge [4.05%, p<0.0001]. Head and face were the commonest injury sites in the paediatric group [n=55, 38.5%, p=0.0022], whereas the extremities were the commonest injury sites in the elderly [n=46, 59.0%, p=0.5214]. The commonest locations for injury were footpath (21.8%), on a carriageway without crossing control (15.7%) and on a controlled crossing (14.7%). Most were injured under no special circumstances (n=184), followed by running onto the road (n=109), crossing an overcrowded footpath (n=19) and an obstructed footpath (n=15).

Conclusions: Elderly pedestrian victims suffered more severe injury and had poorer outcome. The characteristics of the injury pattern among the different age groups are important in planning future prevention programmes.

7. OUTCOME OF TRAUMATIC EXTRADURAL HAEMATOMA IN HONG KONG

PSY Cheung,¹ JMY Lam,^{1,2} JHH Yeung,^{1,2} TH Rainer,^{1,2} CA Graham,^{1,2}

¹Trauma & Emergency Centre, Prince of Wales Hospital;

²Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Objectives: Traumatic extradural haematoma (EDH) is a neurosurgical emergency and timely surgical intervention for significant EDH is the gold standard. This study aimed to determine the incidence and mortality of consecutive patients with traumatic EDH admitted to the Emergency Department (ED) of Prince of Wales Hospital (PWH), a university hospital trauma centre in Hong Kong.

Methods: This was a retrospective analysis of prospectively collected data for all consecutive trauma cases admitted through the ED during 2001-2004. EDH was diagnosed by CT in all cases. Both primary and delayed onset EDH were included, as were patients with combined EDH and other intracranial lesions (e.g. subdural haematoma). Age, sex, cause of injury, associated intracranial lesions, skull fracture, Glasgow Coma Scale (GCS), pupil reactivity, treatment, length of stay and clinical outcome were determined.

Results: There were 2,208 patients in the trauma registry for 2001-2004. From a total of 1,080 head injured patients, 89 patients had traumatic EDH: mean 1.9 patients per month, 70 (78.7%) male, mean age 37.7 years. Fifty (56.2%) patients were from road traffic crashes, 27 (30.3%) sustained falls, and 10 (11.2%) had direct head trauma. On admission, 62 (69.7%) patients were GCS 13-15, 9 (10.1%) GCS 9-12 and 18 (20.2%) GCS 3-8. Sixty-six (74.2%) patients had skull fracture. Thirty (33.7%) patients underwent neurosurgical operation. Overall, 9 patients (10.1%) died; 8 patients were GCS <8; 5 had bilateral fixed and dilated pupils; and 1 had a single fixed and dilated pupil. Four patients died after neurosurgical operation, 3 of whom had fixed dilated pupils and were GCS 3 prior to surgery. The median length of hospital stay for the survivors was 10.4 days.

Conclusions: Survival from traumatic EDH was 89.9% (80/89) and 91.3% (73/80) of the survivors had a Glasgow Outcome Score of 4 or 5 (good or moderate). The combination of bilateral fixed dilated pupils and GCS 3 suggests severe primary brain injury. Emergency evacuation of intracranial haematoma is unlikely to improve the outcome for these patients. Even in an urban environment with short prehospital time and rapid access to neurosurgery, the outcome in patients who are GCS 3 following EDH is likely to be poor.

8. EPIDEMIOLOGY OF PELVIC FRACTURES IN A HONG KONG EMERGENCY DEPARTMENT TRAUMA CENTRE

CH Cheng, CA Graham, NK Cheung, JHH Yeung, CY Man, TH Rainer

Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Objectives: To describe the epidemiology of pelvic fractures in a university teaching hospital, which is one of five trauma centres in Hong Kong.

Methods: This was a retrospective analysis of prospectively collected trauma registry data. All consecutive trauma cases admitted through the emergency department (ED) trauma rooms between September 2001 and June 2005 were included. Age, sex, cause of injury, injury severity score (ISS), treatment, length of stay and clinical outcome were determined. Data were analysed using non-parametric techniques. Patients with major trauma (injury severity score [ISS] >15) were analysed further to identify any factors influencing mortality.

Results: 125 patients with pelvic fractures were identified for the study; 44 (35%) were female and 81 (65%) were male; with mean age of 42 years (range 13 to 99 years). Fall from a height accounted for 35 (28%) patients, motor vehicle crashes for 48 (38%) patients, 37 pedestrians (30%) and other mechanisms were responsible for 5 (4%) patients. One hundred and three (82%) of patients were local, 22 (18%) were transferred from other hospitals including 6 patients transferred from China and Taiwan. Seventy-six (61%) cases were ISS ≥16, and the mortality rate for these patients was 37% (46/125); 13 of these patients were dead on arrival. Trauma calls were activated in 62 (50%) cases. The mortality for patients with a trauma call was 23% and the mortality for those without a trauma call was 24%, p=0.87. Multi-system injuries (head, chest and abdomen) were common. Sixty-two percent (8/13) patients who arrived in the ED with a systolic BP ≤90 mmHg died. Seventy-two (58%) patients had surgery and 34 (27%) were admitted to ICU with a mean ICU length of stay (LOS) of 3 days. Mean inpatient LOS was 19 days. Multiple logistic regression showed that ED GCS (p=0.001) and ED systolic BP (p=0.018) are the best predictors of mortality.

Conclusions: Patients with pelvic fractures often have multi-system injury and have a high mortality. The Glasgow coma scale and systolic blood pressure are ED predictors of survival in these patients.

9. SURVIVAL TRENDS IN PATIENTS WITH MAJOR TRAUMA PRESENTING TO A TRAUMA CENTRE IN HONG KONG

NK Cheung, CA Graham, TH Rainer

Accident & Emergency Academic Unit, The Chinese University of Hong Kong, Hong Kong

Improvements in systems of trauma care should improve survival for patients with major trauma. In the last decade

measures have been introduced to Prince of Wales Hospital of New Territories East Cluster of Hong Kong in order to improve trauma care including the introduction of trauma teams, rapid activation of trauma call, a trauma nurse coordinator, high quality data collection on all trauma cases admitted to the resuscitation room, the development of a trauma database, advanced trauma life support training, trauma management guidelines, a regular tertiary survey, regular multidisciplinary trauma audit meetings, a trauma advisory committee, and primary trauma diversion. Using modified US and UK coefficients, this study presents changes in the W-score over the last 10 years. Over the last decade, using US coefficients, the W-score statistic has improved from -4.75 in 1996 to +0.69 in 2005 i.e. from an excess of 5 deaths per 100 major trauma patients to an excess of one survivor per 100 major trauma deaths. The M score was 0.98 and Z score -0.41. Using UK coefficients, the W-score statistic has improved from -3.50 in 1996 to +1.84 in 2005 i.e. from an excess of 4 deaths per 100 major trauma patients to an excess of 2 survivors per 100 major trauma deaths. The M score was 0.98 indicating that the case mix was similar between UK and Hong Kong. The Z score was 3.82 indicating that the differences were statistically significant. In conclusion, improvements in the trauma system in Hong Kong have resulted in measurable and demonstrable improvements in patient survival.

10. FIRST QUALITY ASSURANCE REPORT FOR EMERGENCY DEPARTMENT ULTRASOUND IN THE NEW TERRITORIES EAST CLUSTER TRAUMA CENTRE

MK Tam,^{1,2} TH Rainer^{1,2}

¹Accident & Emergency Department, Prince of Wales Hospital; ²Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Introduction: Prince of Wales Hospital (PWH) is the designated trauma centre for the New Territories East Cluster (NTEC). Our emergency department (ED) is the first local emergency department to define the scope of practice of ED ultrasound, develop a clear-cut policy on ED ultrasound training, and implement a department-based credentialing system with a build-in quality assurance (QA) mechanism. Here we report the results of the first QA exercise three years after the program implementation.

Methods: As required by the ED ultrasound QA policy, every scan done in the department must be documented by filling out a Data Sheet and thermal printouts of representative images. Confirmatory studies of the scans are traced regularly every six months and filed together with the Data Sheets. The type, indications, findings and accuracy of every scan are entered into a database maintained by the clinician-in-charge of ED ultrasound and then analysed. The results for the year 2003 are presented here.

Results: During the 12-month period from January 2003 to December 2003, a total of 641 focused ED ultrasound studies were done in 493 patients (mean: 41 patients per month or 1.4 patients per day). Twelve emergency physicians (credentialed plus in-training) did the scans. The number of patients scanned by each emergency physician ranged from

3 to 141 with an average of 41 per physician. The indications for focused ED ultrasound in descending order of frequencies were non-trauma abdominal scans (n=270, 42.1%), followed by FAST (Focused Assessment with Sonography for Trauma) (n=251, 39.2%), pelvic scans (n=46, 7.2%), cardiac scans (n=36, 5.6%) and vascular scans (n=15, 2.3%). The diagnostic accuracy (sensitivity, specificity, positive and negative likelihood ratios) of the top three ED ultrasound indications were as follows: non-trauma abdominal (90.3%, 93.9%, 14.9, 0.1); FAST (60.0%, 97.9%, 28.2, 0.4); pelvic (93.3%, 90.5%, 9.8, 0.07).

Conclusions: The effectiveness of our comprehensive and structured ED ultrasound program is illustrated by the high accuracy of our studies. The pattern of utilisation reflects our role as the Trauma Centre of the NTEC.

11. EVALUATION OF TRAUMA CALL GUIDELINES FOR TRAUMA PATIENTS TRIAGED TO THE RESUSCITATION ROOM OF AN EMERGENCY DEPARTMENT IN HONG KONG

NK Cheung, CA Graham, TH Rainer
Accident & Emergency Academic Unit, The Chinese University of Hong Kong, Hong Kong

Background: Current recommendations emphasise that the rapid assembly of a trauma team in the emergency department (ED) in response to a 'trauma call' will improve mortality outcome, yet there is little data to justify which activation criteria are likely to predict poor outcome. The aim of this study was to evaluate trauma call activation criteria and to determine which aspects were most useful in trauma call activation.

Methods: This was a retrospective study using data collected prospectively between January 2001 and February 2005 for the trauma registry of an academic trauma centre in Hong Kong. Patients who died before arrival at the ED were excluded. Trauma call was recommended according to one of 10 guidelines. Fisher's exact test and multivariate logistic regression were used to analyse the data.

Results: 2,031 patients (mean age 40 years, SD 21; 70% male; 94% blunt trauma) were included. Motor vehicle/bicycle crashes accounted for 980 (48%) and falls for 569 (28%) cases. One hundred and twenty-six (6%) patients died. Trauma call was activated in 433 (21%) cases. The table shows univariate and multivariate comparison of predictors.

Conclusion: Trauma call activation criteria could be simplified from 10 to 4 criteria. Simplification would aid memory and may enhance compliance.

	Survived	Died	P value	Adjusted Odds Ratios (95%CI)	P value
Mean age - years	38	64	<0.0001	1.04 (1.03-1.05)	<0.0001
Male sex	1360	68	<0.0001	0.53 (0.24-0.83)	0.0049
1. Haemodynamic instability	32	11	<0.0001	16.8 (7.4-38.2)	<0.0001
2. Respiratory distress	0	1	0.0622	-	0.9992
3. GCS ≤13	118	58	<0.0001	22.0 (13.3-36.4)	<0.0001
4. Penetrating injury of head to groin	20	2	0.6435	5.8 (1.2-26.9)	0.0252
5. Blunt injury to chest/abdomen	125	18	0.0032	8.5 (4.5-15.9)	<0.0001
6. Flail chest	0	0	-	-	-
7. Spinal injury with paralysis	19	0	0.6266	0	0.9976
8. ≥2 proximal long bone fractures	9	0	>0.9999	0	0.9983
9. Open/depressed skull fracture	27	1	>0.9999	2.6 (0.3-20.2)	0.3679
10. Unstable pelvis fracture	25	1	>0.9999	2.1 (0.27-16.5)	0.4776

12.

DIFFERENCES IN INJURY PATTERN AND MORTALITY BETWEEN HONG KONG ELDERLY AND YOUNGER PATIENTS

CH Cheng, NK Cheung, JHH Yeung, CA Graham, CY Man, TH Rainer

Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Objectives: In Hong Kong, 16.5% of emergency department (ED) trauma attendances are aged ≥ 65 years. We aimed to compare the causes, patterns and severity of injury between elderly (≥ 65 years) and younger adult patients (15 to 64 years).

Methods: This trauma registry-based study included patients who were triaged critical or urgent, required intensive care unit (ICU) admission or who died during a 5-year period (December 2000–November 2005).

Results: 2,172 patients (605 [27.9%] ISS >15 ; 331 [15.2%] elderly and 1,841 [84.8%] younger) were included. Compared with younger patients, the elderly group had fewer males (163 [49.2%] vs 1,393 (75.7%); $P<0.01$), higher comorbidity rate (58.6% vs 14.1%; $P<0.01$), and higher mortality rate (21.1% vs 3.6%, $P<0.01$). Compared with younger patients, the elderly group had a higher proportion with ISS >15 (140 [42.3%] vs 465 [25.3%]; $P<0.01$). Compared with younger patients, the elderly group had less trauma call activation (38.6% vs 53.3%; $P<0.01$) and a higher mortality rate (42.9% vs 13.8%; $P<0.01$) in major trauma. Compared with younger patients, the elderly group were more likely to be involved as pedestrians (19.0% vs 9.5%; $P<0.01$) than as drivers (0.6% vs 15.6%; $P<0.01$), and had a higher MVC-related mortality rate (23.8% vs 7.9%; $P<0.01$); and to have more falls <2 metres (54.4% vs 10.3%; $P<0.01$), which resulted in major trauma in 37.2% vs 16%, ($P<0.01$), and an associated fall-mortality rate of 22.2% vs 3.7% ($P<0.01$). High falls (>2 metres) were less common in the elderly group (5.1% vs 11.0%) although the mortality rate was higher (29.4% vs 7.4%). AIS evaluation revealed more frequent head/neck (53.2% vs 47.5%; $P<0.01$) and abdominal injuries (13.4% vs 5.1%, $P<0.01$) in elderly patients.

Conclusions: Compared with younger patients, elderly trauma affects more women, results in less trauma activation but has a higher mortality rate.

Free Papers**Track E3: Medical**

13.

CLINICAL EFFICACY OF VIDAS D-DIMER ASSAY IN THE DIAGNOSIS OF AORTIC DISSECTION IN THE LOCAL CHINESE POPULATION IN AN EMERGENCY DEPARTMENT

YC Lui

Accident & Emergency Department, Queen Elizabeth Hospital, Hong Kong

Introduction: Acute aortic dissection is one of the most lethal conditions in the spectrum of chest pain syndromes. With expedient diagnosis and optimal medical and surgical therapy, however, 30-day survival can exceed 90%. Non-invasive imaging modalities permit rapid and safe diagnosis of dissection even in the early stage of intramural haematoma. With poorly defined criteria for imaging of the aorta, however, 35% of dissections have not been subjected to imaging. So far, there is no laboratory test, as opposed to acute coronary syndromes, to aid the diagnosis. The availability of 'bedside' D-dimer assay (VIDAS, Biomerieux) has the implication that patients can have more speedy assessment and diagnosis. Overseas studies suggested that acute aortic dissection was associated with an elevation of fibrin degradation products, D-dimer.

Objectives: We systematically investigated the relationship between elevated D-dimer levels and acute aortic dissection in the local Chinese population. We also tried to identify different clinical variables associated with aortic dissection in order to facilitate estimation of the individual risk of dissection.

Methods: This prospective study between August 2005 and October 2006 involved consenting Chinese patients over the age of 18 who presented to the Accident and Emergency Department of Queen Elizabeth Hospital with suspected or confirmed aortic dissection. Patients presenting with symptoms and signs of aortic dissection, namely, acute chest pain with immediate onset, pain tearing or ripping in character, or both; mediastinal widening, aortic widening, or both on chest radiography; or pulse differentials, blood pressure differentials, or both, would be recruited as suspected cases of aortic dissection. Patients with confirmed diagnosis of aortic dissection referred from others were also included. All patients would have their D-dimer testing by using the bedside VIDAS D-dimer assay. The VIDAS system uses the Enzyme Linked Fluorescent Assay (ELFA) principle, combining the enzyme-linked immunosorbent assay (ELISA) test method with a final blue fluorescent reading. VIDAS D-dimer assay is a fully automated, quantitative ELISA method adapted for use with the mini-VIDAS immunoanalyser, which allows for single dose tests with ready-to-use reagents. Results are available in 35 minutes. The cut-off value of normal D-dimer is <500 fibrin equivalent units (FEU) ng/ml, any value above this is defined as abnormal.

Results: All patients with aortic dissection were positive with cut-off value $>1,000$ ng/ml and a range of 1,094 to 7,577

ng/ml. The sensitivity was 100%. However, the specificity was only 58%.

Conclusions: Basing on our observation, VIDAS D-dimer assay is sensitive in detecting aortic dissection (sensitivity 100%) and can be used as an additional marker for risk stratification and triage for expedient imaging.

14.

WHICH ANTIBIOTIC FOR EMERGENCY DEPARTMENT TREATMENT OF URINARY TRACT INFECTIONS?

KL Yan, KC Ng, CA Graham, TH Rainer
Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Introduction: Stable patients with symptomatic urinary tract infections (UTI) of bacterial aetiology commonly present to accident and emergency departments. Initial antibiotic treatment is usually prescribed in the absence of positive cultures but antibiotic therapy should have a high probability of effectiveness and safety and be inexpensive.

Objectives: To assess the susceptibility and resistance of urinary pathogens to oral antibiotics in patients presenting with community acquired UTI to an emergency department in Hong Kong.

Methods: Culture-positive urine samples were collected from 526 patients presenting consecutively to the emergency department of Prince of Wales Hospital in 2004. Uncomplicated UTI was diagnosed by symptomatology with urine dipstick in most of the cases without obvious urinary tract abnormality. Data collected included common uropathogens, sensitivity/resistance to antibiotics, cost of antibiotics and adverse events.

Results: The most common bacteria isolated were *Escherichia coli* (72.9%), *Klebsiella* (4.8%) and *Streptococcus agalactiae* (4.6%). The sensitivity of *E. coli* to antibiotics was: ampicillin (38.5%), co-trimoxazole (64.5%), ciprofloxacin (84.8%), cefuroxime (58.1%), amoxicillin-clavulanate (87.4%), and nitrofurantoin (97.3%). Costs of single courses of antibiotics were as follows: amoxicillin-clavulanate HK\$19.32, nitrofurantoin HK\$2.8, cefuroxime HK\$104.44, and ciprofloxacin HK\$10.68.

Conclusions: In the early treatment of uncomplicated, community-acquired UTI, pending bacterial confirmation, nitrofurantoin should be the first choice option because it is effective against >97% of *E. coli* and is cheap. Empirical initial treatment with co-trimoxazole is not cost effective in areas with more than 10-20% resistance in cases with *E. coli*.

15.

PROGNOSTIC VALUE OF NON-INVASIVE CARDIAC INDEX MEASUREMENT IN THE EMERGENCY DEPARTMENT USING PORTABLE CONTINUOUS WAVE DOPPLER DEVICE (USCOM): A PILOT STUDY

MK Tam,^{1,2} TH Rainer^{1,2}

¹Accident & Emergency Department, Prince of Wales Hospital; ²Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Introduction: Ultrasonic Cardiac Output Monitor (USCOM) represents a major advance in patient assessment in the emergency department (ED). It enables the emergency physician to gain essential information on the central haemodynamics of patients requiring resuscitation. Clinical applications of USCOM include early shock recognition, differential diagnosis of shock, monitoring therapy, goal-directed resuscitation and transcatheter pacing. However, little is known about USCOM's prognostic value. This is a pilot study to obtain parameter estimates and to test the logistics for planning a larger study to determine whether a low cardiac index (CI) during the initial resuscitation stage in the ED (as measured non-invasively using USCOM) is associated with a poorer outcome during the course of hospitalisation.

Methods: Trained operators used USCOM to measure the initial CI of patients with cardiovascular emergencies requiring resuscitation in the ED. The CIs of patients with specific adverse events were compared to those without the adverse events. Pre-defined cut-off values of CI were tested for sensitivity, specificity and predictive values for the adverse events. The overall performance of non-invasive cardiac output measurement using CW Doppler (USCOM) for detecting specific adverse events would be evaluated using the Receiver Operating Characteristic (ROC) curve. The magnitude of difference between the mean CI of patients with adverse events and those without the adverse events would be used to calculate the required sample size for conducting a larger study with 80% power and a significance level of 0.05.

Results: Of the 40 resuscitation patients with cardiovascular emergencies, 16 had one or more of four adverse events [ADV] (death, ICU admission, requirement of inotropic support, intubation and/or ventilation). The mean CI of the patients with ADV was significantly lower than that of patients without ADV (1.75 vs. 2.12 L/min/m², Mann-Whitney U test). The required sample size for conducting a full-scale study with 80% power and a significance level of 0.05 was calculated to be 188. Using a CI of 2 L/min/m² as cut-off, the sensitivity and specificity for detecting ADV were 75.0% and 45.8%, respectively. The area under the ROC curve for CI to predict one or more ADV was 0.70 (95%CI: 0.52 - 0.88).

Conclusions: The results of this pilot study indicated that cardiovascular emergency patients who did worse during hospitalisation had a significantly lower initial CI than those who did better. A larger study with the calculated sample size is therefore justified.

16.

A RETROSPECTIVE REVIEW OF THROMBOLYTIC THERAPY FOR ACUTE ISCHAEMIC STROKE

SH Leung

Accident & Emergency Department, Tuen Mun Hospital, Hong Kong

Objectives: The objectives were to review the clinical outcome of patients with acute ischaemic stroke after receiving thrombolytic therapy and also to identify the reasons for those who did not have reperfusion therapy.

Methods: For a two-year period from 1 July 2004 to 30 June 2006, the medical records of all patients admitted to Tuen Mun Hospital with a diagnosis of acute stroke were retrieved from the hospital computer database. Time intervals from the onset of symptoms to reperfusion therapy were recorded. The review consisted of three parts. In part one, we looked for positive results as indicated by an improvement of 4 points over baseline values in the score of the National Institutes of Health Stroke Scale (NIHSS) or resolution of the neurologic deficit within 24 hours of the onset of stroke. In part two, we analysed the clinical outcome of these patients at three months. In part three, we looked for intracerebral haemorrhage after giving thrombolytic therapy.

Results: From July 2004 to June 2006, 2,782 patients were diagnosed to have acute stroke and were admitted to Tuen Mun Hospital. A total of 14 patients received thrombolytic therapy, 6 of them were treated with intra-arterial urokinase while 8 were given intravenous tissue plasminogen activator (tPA). Mean needle time for intra-arterial urokinase (from 2 hours 30 minutes to 5 hours 40 minutes) and intravenous tPA (from 95 minutes to 2 hours 55 minutes) were 262 minutes (window period less than 6 hours) and 134 minutes (window period less than 3 hours) respectively. For part one, 10 patients (6 intra-arterial patients; 4 intravenous patients) had an improvement of 4 points in NIHSS score within 24 hours, 3 patients (all receiving tPA) did not improve and 1 patient died shortly after receiving tPA. For part two, 8 patients (6 intra-arterial patients; 2 intravenous patients) had minimal neurological disability after three months. The remaining 5 patients receiving tPA had poor recovery. Thirteen out of the 14 patients survived after three months. The mortality rate was 7% whereas the mortality rate of the non-treated group was 27%. For part three, 5 patients (36%) had haemorrhagic transformation after receiving thrombolytic therapy. All were asymptomatic. Three of them were given tPA whereas two of them were treated with urokinase. The one who died shortly after thrombolytic therapy had no haemorrhage in the CT brain.

Conclusions: Only 14 out of 2,782 patients successfully received thrombolytic therapy. The main reason was that most of the patients attended the accident and emergency department after the golden three hours. The other reasons were lack of thrombolytic therapy service after office hours, contraindications to reperfusion therapy and lack of consent. Therefore, public education is essential to raise the level of stroke awareness in Hong Kong so that patients could attend earlier.

17.

INTRAVENOUS THROMBOLYSIS AND IMMEDIATE CORONARY ANGIOPLASTY IN ACUTE MYOCARDIAL INFARCTION – FIVE YEARS OF EXPERIENCE

MCY Lau, G Chu, KC Chu

Accidents & Emergency Department, Queen Elizabeth Hospital, Hong Kong

Immediate percutaneous transluminal coronary angioplasty (PTCA) and use of thrombolytic agents are the current methods used in the management of acute myocardial infarction (AMI). In our hospital, immediate PTCA has been introduced from January 2001 as the treatment modality during office hours for AMI patients who had previously been treated with streptokinase. We evaluated prospectively from the period of January 2001 till December 2005 those patients diagnosed as AMI in our department, and subsequently treated with either of the modalities. Patients would receive PTCA by our cardiologists during office hours while in other patients streptokinase was commenced at the accident and emergency department once the diagnosis was made and there was no contraindication. We prospectively reviewed their mortality, rate of recurrence, and complications. A total of 2,380 patients were diagnosed with AMI within the period, and among those, 338 were treated with streptokinase. Immediate PTCA is noted to be superior in terms of mortality, rate of recurrent angina and reinfarction, while thrombolytic therapy is still having a unique role for managing such patients.

18.

OBSERVER AGREEMENT OF NON-INVASIVE CARDIAC OUTPUT MEASUREMENT IN THE EMERGENCY DEPARTMENT USING PORTABLE CONTINUOUS WAVE DOPPLER DEVICE (USCOM)MK Tam,^{1,2} CO Tang,^{1,2} KHW Lai,³ VTY Yeung,³ ELK Man,³ AHL Lam,³ TH Rainer^{1,2}

¹Accident & Emergency Department, Prince of Wales Hospital; ²Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong; ³Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong

Introduction: Early recognition and treatment of shock has been shown to improve patient outcome and survival dramatically. Physical examination and conventional vital signs are known to be inaccurate. Central haemodynamic indices (e.g. cardiac output) are much more sensitive in this respect. Pulmonary catheterisation and thermodilution is impractical in the emergency department (ED). By the time patient reaches the intensive care unit (ICU), the 'golden hour' to treat shock with the best possible outcome has passed. Non-invasive cardiac output measurement using portable Ultrasonic Cardiac Output Monitor (USCOM) is the solution to the above dilemma. However, the technique of using USCOM is still operator-dependent. This study aimed to determine the level of inter-operator agreement in using USCOM to measure cardiac output in the ED.

Methods: Three operators received standardised training on using USCOM. They then measured the cardiac output of the same 119 subjects independently and blinded to each other's measurements during the process. Subjects were recruited from patients in the emergency department or observation ward or healthy volunteers aged 18 years or over, with no pre-existing aortic valve disease, prosthetic aortic valve or atrial fibrillation. Inter-operator agreement was measured by the intraclass correlation coefficient (ICC) under the two-way random effects ANOVA model, and by plotting the difference between each pair of operators' readings against the corresponding mean for each subject.

Results: The intraclass correlation co-efficient was 0.859 (95%CI 0.813 to 0.896), indicating an excellent overall inter-operator agreement corrected for agreement-by-chance. Bland-Altman analysis showed that the mean difference between each pair of operators' USCOM cardiac output measurement on the same 119 patients were -0.23 L/min (95%CI: -0.38 to -0.06), 0.09 L/min (95%CI: -0.10 to 0.28) and 0.31 L/min (95%CI: 0.15 to 0.47), which were very small and therefore unlikely to result in differences in clinical decision-making.

Conclusions: USCOM has a high level of inter-operator agreement despite its operator-dependent nature, and would be of great value to the ED physician for the early recognition of shock and for monitoring the response to resuscitation.

19.

A NEW CLINICAL DECISION RULE FOR PREDICTING THE SEVERITY OF COMMUNITY ACQUIRED PNEUMONIA IN THE EMERGENCY DEPARTMENT

SY Man,¹ N Lee,² M Ip,³ GE Antonio,⁴ SSL Chau,¹ P Mak,¹ CA Graham,¹ PKS Chan,³ AT Ahuja,⁴ DSC Hui,² JJY Sung,² TH Rainer¹

¹Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong; ²Department of Medicine and Therapeutics, The Chinese University of Hong Kong; ³Department of Microbiology, The Chinese University of Hong Kong; ⁴Department of Diagnostic Radiology & Organ Imaging, The Chinese University of Hong Kong, Hong Kong

Introduction: Community acquired pneumonia (CAP) is a leading infectious disease cause of death throughout the world, including Hong Kong. The aim of this study was to develop a new clinical decision rule for use in the emergency department for risk-classification of patients with acute CAP to guide decision-making and management planning.

Methods: This was a prospective study conducted in the emergency department (ED) of a university teaching hospital over a 12-month period in 2004. A new clinical decision rule was derived and validated from a cohort, in which 1,016 consecutive CAP patients were split into two groups for rule derivation and validation. The performance of the new rule was then compared with PSI and CURB-65. The primary outcome measure was 30-day all-cause mortality.

Results: Four prognostic variables were identified from the derivation group which were independently associated with

mortality: arterial pH<7.35 [OR 3.44 (1.67-7.08)], bilateral lung involvement in the chest radiograph [OR 3.46 (1.77-7.08)], confusion [OR 4.04 (1.94-8.41)] and urea >7 mmol/L [2.33 (1.13-4.79)]. A new predictive rule ('ABCU') was constructed with these four variables into a seven-point scale scoring system (0-6) that classified patients into low (score 0), intermediate (score 1-3) and high (score >3) risk groups according to their score-mortality distribution and clinical practicability. The new rule was then tested in the validation group. The mortality rate of the low risk group was 1.4%, the intermediate risk group was 7.2% and the high-risk group was 29.2%. Its low risk group had the lowest mortality rate (1.4%) whilst its high-risk group had the highest mortality rate (29.2%) and highest ICU admission rate (11.1%) among the three rules. The areas under the receiver operator characteristic (ROC) curve for ABCU, PSI and CURB-65 were 0.794 (0.723-0.864), 0.725 (0.647-0.804) and 0.735 (0.656-0.814) respectively.

Conclusions: ABCU is at least as accurate as other scoring systems in overall mortality prediction. However, it may be more suitable than other rules for use in the emergency department in terms of its usefulness in identifying low risk patients for potential outpatient care and its practicality. Prospective multicentre validation studies are now required.

Free papers

Track F3: Miscellaneous

20.

EVALUATING THE PREDICTIVE VALUE OF THE ALVARADO SCORE IN MAKING DISPOSAL DECISIONS OF PATIENTS SUSPECTED TO BE SUFFERING FROM ACUTE APPENDICITIS IN THE ACCIDENT AND EMERGENCY DEPARTMENT OF A REGIONAL HOSPITAL IN HONG KONG

CW Chau, HF Ho

Accident & Emergency Department, Queen Elizabeth Hospital, Hong Kong

Background: Acute appendicitis is a common surgical emergency. Several practical scoring systems have been developed in recent years to assist clinicians in the diagnosis of acute appendicitis. Alvarado retrospectively found eight predictive factors useful in making the diagnosis.

Objective: The aim of this study was to evaluate the predictive value of the Alvarado Score in making disposal decision of patients suspected to be suffering from acute appendicitis.

Methods: This was a prospective cross-sectional study performed from 1 November 2005 to 28 February 2006 in the accident and emergency department of a regional hospital in Hong Kong. Attending emergency physicians evaluated patients who attended the emergency department for suspected appendicitis, and filled in the study pro forma. The attending emergency physicians determined disposition of the patient in the usual manner, independent of the score.

Results: A total of 120 patients were included in the study with 28 patients diagnosed to have acute appendicitis by operative intervention and pathological confirmation. Seventy-five patients were admitted. The admitted patients with score 1-4, 5-7 and 8-10 were 12, 33, and 30, respectively. The numbers of appendicitis in each group were 0 (0%), 10 (30%), 17 (56%) respectively. 45 patients were discharged from the emergency department. Those discharged with score 1-4, 5-7 and 8-10 were 32, 11, and 2, respectively. The numbers of appendicitis in each group were 0 (0%), 0 (0%), and 1 (50%) respectively. For the two patients discharged with score >7, one re-attended with an appendicular abscess. The positive and negative predictive values of Alvarado Score >4 were 36% and 100% respectively. The positive and negative predictive values of Alvarado Score >7 were 56% and 88% respectively. Anorexia, elevated temperature, leukocytosis and neutrophilic shift were related to appendicitis in a statistically significant ($p<0.05$) manner.

Conclusions: It appears safe to discharge those patients with Alvarado score less or equal to 4. For those with score more than 4, further observation and evaluation will be required.

21.

MANAGEMENT OF PATIENTS WITH FOREIGN BODY INGESTION – IS ENDOSCOPIC EXAMINATION MANDATORY?

WMM Lee, WCY Hung

Accident & Emergency Department, Tuen Mun Hospital, Hong Kong

Objective: Foreign body ingestion (FBI) is a common presentation to the accident and emergency (A&E) department. The aim of this study was to determine predictive factors for the presence of foreign body (FB) in endoscopic study in patients presenting with a history of FBI.

Methods: This was a prospective study. All patients attending the Accident and Emergency Department of Tuen Mun Hospital from 1 November 2005 to 31 January 2006 for FBI were recruited. The potential predictive factors for positive oesophagogastroduodenoscopy (OGD) finding after FBI were analysed by univariate logistic regression. These factors included the time between FBI and medical consultation, dysphagia, odynophagia, shortness of breath, haemoptysis, fever, level of FB sensation and radiological findings in the neck X-ray.

Results: 302 patients were included in this study. One hundred and fourteen patients were male and 188 patients were female. The mean ages of the patients with and without FB were 41.92 and 43.07 respectively. Most of them ($n=299$, 99.0%) presented with fish bone ingestion. Others presented with food bolus ($n=1$), duck bone ($n=1$), pork bone ($n=1$), and toothpick ($n=1$). Seventy-one FB were identified with direct laryngoscope (DL). Most of them were found at the tonsil ($n=24$, 33.8%), tongue base ($n=16$, 22.5%), vallecula ($n=16$, 22.5%), and pyriform fossa ($n=10$, 14.1%). Thirty-two FB were identified with OGD and 26 (81.3%) of them were found at or above the cricopharynx. Univariate

logistic regression analysis showed that presentation of odynophagia (OR=1.704, 95%CI 1.047-2.773, $p=0.032$), presence of FB shadow in lateral neck X-ray (OR=5.171, 95%CI 2.003-13.349, $p=0.001$) and early presentation to A&E (14.55±2.55 hours vs. 25.96±2.91 hours) were significant independent factors associated with the presence of FB in throat; whereas negative DL finding in a patient presenting with a supra-cricoid FB sensation was associated with negative OGD finding (OR=0.2, $p=0.011$).

Conclusions: For patients with odynophagia, FB shadow in neck X-ray and early presentation to A&E, clinicians should pay more caution because they have a higher chance of having true FB in the throat. Those with supra-cricoid FB sensation and negative DL finding could be discharged home with clear explanation and should be advised to re-attend the A&E if symptoms persist or worsen. Further study is recommended to establish a clinical prediction rule model in patients with FB ingestion for the need of OGD.

22.

TEACHING EFFECTIVENESS OF THE BASIC COURSE ON FOCUSED ULTRASOUND FOR EMERGENCY PHYSICIANS AND SURGEONS

MK Tam,^{1,2} TH Rainer^{1,2}

¹Accident & Emergency Department, Prince of Wales Hospital; ²Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Background: In the past, emergency department (ED) ultrasound was taught by unstructured on-the-job training. From 1999 onwards, the Accident & Emergency Central Coordinating Committee (A&E COC) began to commission ultrasound courses from overseas to train local ED physicians. These courses consisted of didactic lectures plus hands-on training. However, the effectiveness of this format of ED ultrasound training has never been documented.

Objective: To determine whether ED ultrasound courses in the format of didactic lecture plus hands-on training can improve two key components of competency (factual knowledge and image interpretation).

Methods: The Accident & Emergency Medicine Academic Unit organised a Basic Course on Focused Ultrasound for Emergency Physicians and Surgeons in May 2004, with teaching staff from the Radiology Department of Prince of Wales Hospital. We used the same teaching format as the COC commissioned training. Teaching effectiveness was assessed by a Pre-test before and a Post-test after the course. Both tests consisted of 20 multiple-choice questions on factual knowledge and 10 Objective Structured Clinical Examination (OSCE) questions on image interpretation.

Results: There were 20 participants (14 emergency doctors, 5 surgeons and 1 physician), none of whom had attended any ultrasound course before. Paired-samples t-test showed that all participants had significantly higher Post-test scores than Pre-test scores in factual knowledge (67.0±2.6 vs 39.8±2.3, $p<0.001$) and image interpretation (85.0±3.0 vs 73.5±3.6, $p=0.02$). There was no difference in test performances between emergency doctors and surgeons

(Pre-test: factual knowledge, $z=-1.36$, $p=0.17$; image interpretation, $z=-1.14$, $p=0.25$; Post-test: factual knowledge, $z=-0.76$, $p=0.45$; image interpretation, $z=-0.96$, $p=0.34$, Mann-Whitney U test). Thirteen participants had previous hands-on ultrasound experience. Two-way ANOVA was conducted to determine whether previous ultrasound experience and the duration in the present specialty had any effect on the test scores. The results indicated a significant effect for previous ultrasound experience on Post-test image interpretation scores ($F=6.41$, $p=0.03$), those with previous ultrasound experience had a higher mean score (91.1) than those without (76.0).

Conclusion: ED ultrasound training using the format of didactic lecture plus hands-on practice can improve both factual knowledge and image interpretation skills.

23. EVALUATION AND VALIDATION OF THE USE OF THE MODIFIED EARLY WARNING SCORE (MEWS) IN THE EMERGENCY DEPARTMENT OBSERVATION WARD

KM Choi, CW Ki, YK Leung, PH Leung, P Mak, CA Graham, TH Rainer

Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Objectives: To validate the use of the Modified Early Warning Score (MEWS) in an emergency department observation ward (EDOW) to identify patients at risk of serious illness and requiring hospital admission.

Methods: This was a prospective cohort study of all consecutive patients admitted to the 16-bed EDOW of a teaching hospital in Hong Kong. Parameters including systolic blood pressure, respiratory rate, heart rate, temperature, Glasgow Coma Scale, and O_2 saturation were recorded by nurses while performing routine observations. The main outcome measures were (1) inpatient hospital admission, (2) re-attendance to the emergency department (ED) within 48 hours and related to the index medical diagnosis after discharge from the EDOW or hospital ward and (3) 30-day mortality.

Results: 428 patients were admitted to the EDOW from 10 April to 8 May 2006. Four hundred and thirteen (96.5%) were recruited and 15 (3.5%) were excluded due to incomplete data record. The mean age of patients was 61 years (range 13-100) with 46% males and 54% females. Forty-six patients were admitted to hospital wards, 10 re-attended the ED within 48 hours of discharge (4 required admission) and 2 patients died by 30 days. The admitted group had a significantly older age ($p=0.001$), faster minimum heart rate ($p<0.0001$) and faster minimum respiratory rate ($p=0.001$) than the non-admitted group. An increase in MEWS score ≥ 4 was associated with the need for hospital admission (OR 8.3; 95%CI 1.1-60.4, $p=0.013$) and for ED re-attendance within 48 hours (OR 45.2; 95%CI 3.4-568.9, $p<0.0001$).

Conclusion: An increase in MEWS score ≥ 4 may help predict the need for hospital admission in an EDOW setting

and may help identify patients who may re-attend the ED within 48 hours.

24. TOWARDS THE IMPROVEMENT OF SERVICES FOR ELDERLY FALLERS ATTENDING AN ACCIDENT AND EMERGENCY DEPARTMENT

PY Yeung,¹ J Woo,¹ VWT Yim,² TH Rainer,² S Wong²

¹Department of Medicine & Therapeutics, The Chinese University of Hong Kong; ²Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

Objectives: Accident and emergency departments (A&E) have been a major source of primary care in Hong Kong. This study documented the profile of elderly fallers presenting to A&E in a regional hospital in order to determine whether a proportion of this high-risk group were intrinsically so frail that intervention would be unlikely to help. The proportion of fallers suitable for falls prevention programme and their willingness to join it were also examined.

Methods: The A&E records for all patients aged 65 or above who attended A&E as a result of a fall were reviewed and all information regarding the fall were obtained in a pilot study for four weeks. For the subsequent five weeks, the elderly fallers who were discharged home after attending A&E were invited to join a prevention programme. Their willingness and reasons for refusal were documented.

Results: Two hundred and twenty-three fallers (mean age: 80.4 ± 8.2) were identified for the pilot. About half were hospitalised and another half were discharged after attending A&E. Multiple diseases were common, with about half of the fallers having two or more diseases, such as stroke or dementia where falls might not be amenable to intervention. During the process of data collection, it was found that many A&E records for falls did not have complete information regarding its risk factors such as past history of falls, circumstances of falls, mobility, functional and social status. For the prevention programme, only 10% of the fallers approached were willing to join it. The major reasons for refusal were lack of companion or difficulty in getting to our training site by transport.

Conclusions: Preventive programmes need to be targeted specifically and held at easily accessible sites in the community. Documentation for falls needs to be improved through education and training.

25. OPTIMISING HAEMODYNAMICS IN THE SHOCKED CHILD – THE DANGERS OF APPLYING ADULT PARAMETERS TO CHILDREN

BE Smith,¹ VM Madigan²

¹Broken Hill Base Hospital; ²Department of Anaesthetics and Critical Care, Broken Hill Base Hospital, Australia

The shocked child is a highly demanding paediatric emergency. The adoption of early goal directed therapy

(EGDT) in resuscitation to improve the haemodynamic status of the patient has resulted in a dramatic reduction in morbidity and mortality in both adults and children, particularly in the area of the septic shock syndrome. The most important physiological variables to assess in the critically ill patient, apart from heart rate and blood pressure, are the cardiac output (CO), cardiac index (CI), stroke volume (SV), systemic vascular resistance (SVR) and oxygen delivery (DO₂). Measurement of these parameters, even in adults, has always involved a high degree of invasiveness, as in the pulmonary artery catheter, or relatively poor accuracy with low invasive devices such as the transoesophageal Doppler. The significant dangers and difficulties of using such invasive monitoring have largely precluded their use in the sick child. In addition, there is very little published data regarding typical values of these parameters in normal children, due to the highly invasive nature of the investigations required and the inevitable distortion of the data that results from the pain and anxiety of performing the measurements. In consequence, many of the therapeutic goals used in the shocked child are extrapolations from adult observations and treatment protocols. The advent of the highly accurate yet entirely

non-invasive ultrasonic cardiac output monitor (USCOM) permits the rapid (less than 5 minutes) determination of CO, CI, SV, SVR and DO₂ in the emergency department. The data can then be used to institute early goal directed therapy and for regular monitoring to ensure that haemodynamics are optimised. We studied 100 children from 1 to 16 years of age using the USCOM to evaluate normal haemodynamics. We found that there were major differences between the typical values found in children and those in adults. The cardiac index for example in our subjects was typically 4.2-4.4 L/min/m² or almost double that quoted for adults. Similar disparities were identified for CO, SV, SVR and DO₂. The often-quoted use of pulse pressure as an indicator of SV and CO was shown to be unsupported in our subjects, with no statistical correlation between pulse pressure and these haemodynamic parameters. We suggest that in the case of the shocked child, extrapolation from haemodynamic values derived from adult investigations are largely inappropriate and potentially dangerous, with serious risk of inadequate treatment of the child. Suggested goals for optimising haemodynamics in children will be presented and contrasted with values typically quoted for adults.

Posters

1. MEASURING ADULTS' BOLUS VOLUME OF SWALLOW: ESTIMATING RISK IN LIQUID POISON INGESTION

PLY Leung, PS Kwan, LK Chan

Accident & Emergency Department, United Christian Hospital, Hong Kong

Introduction: Acute poisoning imposes great impact to the emergency medical service in Hong Kong, with 12% of poisoning involving liquid poisons. The mortality and morbidity of some cases are closely related to the volume ingested, such as wintergreen oil and toxic alcohol. Therefore, the earlier a nurse can ascertain the volume, the more timely would an appropriate treatment be initiated. Since a 'mouthful' or bolus volume of a swallow (BVS) is commonly used as the unit for documentation, studies measuring BVS would be meaningful. Our study would serve as the first one to measure BVS in the Chinese population.

Objective: To determine BVS in Chinese adults.

Methods: Chinese volunteers aged 15-64 years were invited as a convenient sample in a social gathering. People with pre-existing swallowing problem were excluded. Since fluid viscosity and container orifice diameter affect BVS, these two factors were controlled by using room temperature distilled water served in a fixed size cup 7 cm in diameter. The participants were asked to drink 200 ml water continuously and the thyroid cartilage movement was counted. BVS is defined as 200 ml divided by the number of thyroid movements.

Results: The mean BVS was 35.9 ml (3.8 - 68.0 ml, 95%CI).

There was significant difference between that of man and woman, which were 42 ml and 30 ml respectively. Age did not affect BVS in adults. Body weight was related to BVS at correlation coefficient of 0.242.

Conclusions: The BVS in our study was larger and more variable when comparing with overseas studies, though meaningful comparison might not be possible due to different study designs. While males have significantly larger BVS than females, age does not affect BVS. Measuring every single swallow may be more accurate but would be more complicated. Future studies can also be done for children or with container orifice sizes similar to those of household products.

2. PROSPECTIVE COMPARISON OF THREE PREDICTIVE RULES FOR ASSESSING THE SEVERITY OF COMMUNITY ACQUIRED PNEUMONIA IN HONG KONG

SY Man,¹ N Lee,² M Ip,³ GE Antonio,⁴ SSL Chau,¹ P Mak,¹ CA Graham,¹ PKS Chan,³ AT Ahuja,⁴ DSC Hui,² JYJ Sung,² TH Rainer¹

¹Accident and Emergency Medicine Academic Unit, The Chinese University of Hong Kong; ²Department of Medicine and Therapeutics, The Chinese University of Hong Kong; ³Department of Microbiology, The Chinese University of Hong Kong; ⁴Department of Diagnostic Radiology and Organ Imaging, The Chinese University of Hong Kong, Hong Kong

Objective: Community-acquired pneumonia (CAP) is a leading infectious disease cause of death throughout the

world, including Hong Kong. The aim of this study was to compare the ability of three validated prediction rules for CAP to predict mortality in Hong Kong: the 20-variable Pneumonia Severity Index (PSI), the 6-point CURB-65 scale adopted by the British Thoracic Society and the simpler CRB-65.

Methods: This was a prospective observational study of consecutive 1,016 CAP in-patients [583 men (57.4%), mean age 72±17 years] in a university hospital in Hong Kong's New Territories in 2004. Patients were classified into 3 risk groups (low, intermediate and high) according to each rule. We compared their ability to predict 30-day mortality.

Results: The overall mortality and intensive care unit (ICU) admission rates were 8.6% and 4.0% respectively. PSI, CURB-65 and CRB-65 performed similarly and the areas under the ROC curve (95% confidence intervals) were 0.736 (0.687-0.736), 0.733 (0.679-0.787) and 0.694 (0.634-0.753) respectively. All three rules had high negative predictive values but relatively low positive predictive values at all cut-off points. Larger proportions of patients were identified as low risk by PSI (47.2%) and CURB-65 (43.3%), in contrast to CRB-65 (12.6%).

Conclusions: The three predictive rules have a similar performance in CAP severity prediction but CURB-65 is more suitable than the other two rules for use in the emergency department given its simplicity of application and ability to identify low risk patients.

3.

TOPICAL HERBAL MEDICINE INDUCED CONTACT DERMATITIS

ALN Wong, SSW Chan

Accident & Emergency Department, Prince of Wales Hospital, Hong Kong

Objectives: To report the incidence, nature and impact of topical herbal medicine induced contact dermatitis in an accident & emergency (A&E) department.

Methods: A computerised data platform was used to retrieve all A&E attendees from 1 September 2004 to 31 March 2005 with a diagnosis of contact dermatitis. Data were collected through record review and telephone interviews.

Results: 158 cases of contact dermatitis were identified. (Incidence: 17.6 per 1,000 A&E cases). Twenty-nine were caused by topical herbal medicine. (Age range: 7-80 years; mean: 36.6 years; median: 40 years; with 58.6% females and 41.4% males.) Affected parts were: limb 96.5% and trunk 3.5%. Sources of herbal medicine were: bonesetter 65%, Chinese Medicine practitioner 20%, beauty salon 5% and over-the-counter 10%. 48.3% patients were given sick leave (duration range: 1-14 days; mean 2.8 days).

Conclusions: Topical herbal medicine induced contact dermatitis results in absenteeism from work in a considerable number of A&E attendees. Most of the herbal medicine are prescribed by Chinese Medicine practitioners or bonesetters. Further studies can be carried out to identify the specific agents in topical herbs that are the causes of contact dermatitis.

4.

MOVED ON SCENE EMERGENCY CARE THROUGH THE ILLUSTRATION OF TWO CASES

PS Ng,¹ PF Lau,² WK Poon³

¹Accident & Emergency Department, Tseung Kwan O Hospital; ²Accident & Emergency Department, Pamela Youde Nethersole Eastern Hospital; ³Hospital Authority Head Office, Hong Kong

Objectives: The "golden hour" starts from the time the victim is injured. The patient's chance of survival can be maximised by using helicopter air ambulance, especially when the victim is in a remote area. The benefits can be illustrated by reviewing two representative critical cases.

Methods: A retrospective review of clinical records of critical victims cared by the local air rescue team was performed by two experienced flight nurses.

Results: *Case 1* – A worker fell from height on a ship. The rescue team was on scene within 20 minutes via winching down. The victim was noted to have palpable pulse but with profuse bleeding; and a rapid, orderly and thorough examination was completed. The patient arrested after boarding the helicopter and active resuscitation was started but the patient was certified dead 20 minutes after hospital arrival. Optimal speed was achieved by teamwork. *Case 2* – A hiker fell from a 12-foot slope while hiking at Sai Kung, landed with his neck on a rock and was totally paralysed. The rescue team was winched down for stabilisation 30 minutes after his fall. The patient was rescued and transferred to hospital for resuscitation. X-ray showed dislocated 5th and 6th cervical vertebrae. The patient was admitted to the intensive care unit and he developed spinal shock. Operation was performed and there was no post-operative complication. He remained paraplegic and was transferred to a rehabilitation centre two months later.

Conclusions: Caring for trauma victims can be extremely challenging in pre-hospital settings, especially when the scene was remote or accessibility difficult. With helicopter transporting air medical and nursing officers rapidly to the scene to provide high levels of clinical expertise care, evaluation, equipment and procedures after the golden hour starts clicking and en route to the hospital as well as to enhance the victim's transfer speed and safety, the victim's chance of survival would be enhanced.

5.

MISSION IS POSSIBLE -- KEEN OBSERVATION, PROMPT ACTION AND GOOD PREPARATION

ML Chan, CL Cheung

Medical Escort Division, Professional Medical Centre, Hong Kong

Objectives: Basing on the Wenzhou patient escort review, to demonstrate the importance of keen observation and good preparation, which are vital for patient transfer or escort.

Case review: It was a memorable experience I ever had during my years of nursing. It was really an arduous task when I was assigned to a team to escort an old man diagnosed

to have left intraventricular haemorrhage from Wenzhou back to Hong Kong. Such a trip normally takes one-and-a-half hour by flight or an 18-hour ride by ground transport. To my dismay, not until on my arrival, I found that there was no commercial flight available which would allow us to install a stretcher on board with oxygen, respirator and suction apparatus, nor any kind of adjustment. It seemed to be a mission impossible to transfer such a case by ground ambulance. Besides, the patient's condition had changed from the previous information we gathered. From my assessment, the patient had a tracheostomy and was on respirator, non-invasive blood pressure monitor, intravenous lines, a feeding tube, and a Foley catheter. He had been in septic shock, with chest infection and poor blood glucose control but stable with low-grade fever only at the moment. He was prescribed antibiotics intravenously. After the arrival of my buddy, an experienced emergency medical officer, we fully explained the risk en route. The family still strongly requested transfer back to Hong Kong due to the financial implication of prolonged hospitalisation in China. We started our long journey by ground ambulance after the patient was weaned off the respirator with good oxygen saturation on his own breathing. Close monitoring of vital signs, blood sugar monitoring, and frequent turning (inside the ambulance) were done. About half on the way, the patient's condition started to deteriorate with SpO₂ decreased to 90% even with 100% oxygen supply and positive pressure ventilation under sedation. He later developed high fever with tachycardia at 126/min and decreased urine output. Besides supportive treatment with antipyretic, tepid sponging and physiotherapy, the team offered additional medications and tried every possible means and therapy to support the patient. With intensive care and monitoring every 15 minutes throughout the journey, the patient was finally stabilised and we arrived safely in Hong Kong.

Conclusions: "Ready for anything; prepared for everything; surprised by nothing!" is really a good motto to reflect such a patient escort experience. Nothing is impossible but keen observation, prompt action as well as good preparation will be the keys.

6. FEATURES OF PATIENTS FOUND DISAPPEARED FROM THE EMERGENCY DEPARTMENT AND THEIR OUTCOMES

PY Lok, TH Rainer, SSW Chan
Accident & Emergency Department, Prince of Wales Hospital, Hong Kong

Objective: To describe the demographic characteristics and clinical outcomes of patients who leave the emergency department (ED) without completing the entire consultation (disappeared patients).

Methods: This retrospective study compared the demographic characteristics, re-attendance and admission rates between disappeared patients and the total ED population of 2004, in a teaching hospital. Three hundred

sixty-five disappeared ED patients were conveniently sampled in a design to minimise selection bias, and their features were compared with the total ED population of the hospital in the same year.

Results: Compared with the overall group, disappeared ED patients were more likely to be young adults and triage category IV (semi-urgent) and V (non-urgent) patients. The mean age of disappeared ED patients was 31.77 while that of the general ED population was 43.32 ($p < 0.0001$). Patients who needed to pay were less likely to disappear ($p = 0.0003$). Long waiting time was an important factor contributing to disappearance. The average waiting time for disappeared ED patients was 156 minutes while that of the control population was 73 minutes ($p < 0.0001$). Disappeared ED patients had a higher re-attendance rate (7.7% vs 2.7%; $p < 0.0001$) and among those re-attending, 39.3% required admission.

Conclusions: Disappeared ED patients have several different demographic features and outcomes from the general ED population. The problem needs to be looked into more seriously for better quality ED service.

7. ALL PERSONAL PROTECTIVE EQUIPMENT ON BEFORE ALL CARDIOPULMONARY RESUSCITATIONS?

WK Poon,¹ WP Ng,¹ KK Chan²

¹Hospital Authority Head Office; ²Accident & Emergency Department, Queen Elizabeth Hospital, Hong Kong

Introduction: After the SARS epidemic in Hong Kong, standard precautions are applied in all patient care procedures and health care settings regardless of the diagnosis and presumed infection status. Staff is recommended to put on full personal protective equipment (PPE) when performing high-risk procedures. Cardiopulmonary resuscitation (CPR) is considered a high-risk procedure due to the chance of contacting respiratory and nasopharyngeal secretions. Therefore, PPE is recommended but CPR should be started as soon as possible with preset protocols and steps throughout. Retrospective reviews showed that the focus on PPE should be emphasized under risk assessment; and should be conducted on an individual basis like safety assessment at the very beginning. The need and type of appropriate PPE donning should be based on individual assessment results rather than blindly to put on everything or with 'full gear' for completing every task.

Objectives: To review related guidelines, standards and recommendations for PPE.

Methods & results: The review indicated that the major principle on safety and risk assessment was to avoid creating a second victim. This had already been clearly written in all protocols and should be conducted even prior to checking the victim's response and the airway, breathing, and circulation.

- "Rescuer safety requires compliance with precautions for infectious diseases, including the use of pocket masks, gloves, protective clothing" [AHA (2001). ACLS Provider Manual: Systematic ACLS approach].

- "Wear vinyl or latex gloves, take a barrier device for protection" [Heart & Stroke Foundation of Canada (2001). CPR Basic Rescuer: The ABC of CPR].
- "Wear gloves and use a barrier device if available" [Heart & Stroke Foundation of Canada (2001). CPR Heart Saver: The ABC of CPR].

Conclusions: Therefore, it is extremely vital for staff to perform safety assessment for all resuscitations and to determine the appropriate kind of PPE for donning instead of blindly putting on everything in disregard of the risk assessment result. The "safety and risk assessment at all times" culture should be enforced starting from the emergency department – the gate of the hospital.

8. NURSE INITIATED PROTOCOL IN THE ACCIDENT AND EMERGENCY DEPARTMENT

KH Lee,¹ SKY Wong,¹ CY Man,¹ TH Rainer^{1,2}

¹Accident & Emergency Department, Prince of Wales Hospital,; ²Accident & Emergency Medicine Academic Unit, The Chinese University of Hong Kong, Hong Kong

The accident and emergency (A&E) department is a place with high attendance and full of complexity. Staff in the department aim to provide a high standard of care even with heavy workload and limited resources. It is also the

fact that patients have to wait for a long time before being attended by the doctor. Besides first aid, it is beneficial to develop some agreed protocol in order to relieve patients' acute symptoms before seeing the doctor. A nurse-initiated protocol for known asthmatic patients has been created in our department since April 2006. It aims to provide care to asthma patients aged 6 or above. Patients satisfying the pre-set criteria in the protocol will be given salbutamol and ipratropium puff after triage. After the puff is given, the patient will wait for the doctor. Besides, reassessment including repeat peak flow rate (PFR) will be done by the nurse after the puff is provided so as to see how the patient responds to the initial treatment. There were altogether 49 cases collected from 21 April 2006 to 6 August 2006. Thirty-nine patients were treated and discharged in the A&E. Ten patients were admitted after the treatment. Of the 49 patients, 3 had the puff repeated after doctor's assessment. 79% of the patients had good response to the initial treatment as judged by the relief of dyspnoea and improvement in the PFR. Of the 39 patients who were discharged home, 92% did not require repetition of the inhalation of bronchodilators after seeing the doctor. The nurse-initiated protocol can release the distress of asthma patients. Patients need not wait for a long time before the administration of medication to improve their symptoms. It is a kind of innovation in emergency nursing and a good way to provide a high standard of care.