

with a male–female sex ratio of 3.7:1. The most common location of maxillofacial fractures was the mandible 615(77%) and middle third 205(23%). With regards to mandibular fractures, the body (29.6%) was the commonest sites, followed by the angle (24.4%), ramus (19.5%), dentoalveolar (14.6%), symphysis (11.0%), condyle (0.8%) while in the middle third, the nasal bone (36.7%) was the most common, followed by zygomatic bone (27.8), Lefort II (14.4), Lefort I (7.8%), dentoalveolar (10.0%) and Lefort III (3.3%). Majority of the patients were treated by Open reduction and internal fixation (70.6). Concomitant injuries were 10.8% with orthopaedic injuries accounting for the majority (63.9%). Head injury was associated with 16.3 % of cases.

Conclusion: Maxillofacial fractures are on the increase. We advocate the establishment of regionalized trauma centers with basic training available to all surgical residents for initial emergency room management.

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(A74) Reducing the Potential for Tourniquet Associated Reperfusion Injury

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Background: Tourniquets have reappeared in the management of massive hemorrhage and as a tool to ameliorate the effects of reperfusion injury from limb entrapment or suspension trauma, while the patient is rescued to a safer environment. Strategies to minimize subsequent reperfusion injury were investigated in this prospective, randomized study.

Methods: In the safety of an operating theater, sixteen fit and healthy patients scheduled for repair of bimalleolar ankle fractures were randomized into two groups. In the standard release group (R, n1 = 6), the tourniquet was fully deflated at the end of surgery. In the staggered release group (SR, n2 = 10), the tourniquet was fully deflated for 30 seconds and subsequently re-inflated to 300mmHg. The procedure was repeated twice at three-minute intervals prior to full removal. Hemodynamic and blood biochemistry measurements were obtained from an indwelling arterial catheter immediately prior to initial tourniquet deflation and thereafter at 1, 4, 7 and 15 minutes.

Results: Serum Ca²⁺ concentrations were less in group R at 4 (1.027 ± 0.5 vs. 1.084 ± 0.07mmol/l, *p* = 0.046) and 7 minutes (1.045 ± 0.04 vs. 1.110 + /- 0.06mmol/l, *p* = 0.013). Serum lactate concentration was greater in group R compared to group SR at 1 (1.75 ± 0.19 vs. 1.33 ± 0.31mmol/l, *p* = 0.005) and 4 minutes (1.98 ± 0.23 vs. 1.48 ± 0.39mmol/l, *p* = 0.007), respectively. End-tidal CO₂ was less in group SR compared to group R at 1 (4.82 ± 0.45 vs. 5.68 ± 0.26kPa, *p* = 0.0004) and 4 minutes (5.01 ± 0.59 vs. 5.68 ± 0.35kPa, *p* = 0.01), respectively. At 15 minutes, less hypotension and bradycardia was noted in group SR.

Conclusions: A staggered tourniquet release was associated with greater hemodynamic stability and reduced the rate of acute systemic metabolic changes associated with limb reperfusion. Re-application of a tourniquet seemed to halt further reperfusion, providing a window period for patient evaluation and management.

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(A77) Should Response Times continue to be used for Performance Measurement and Targets?

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Purpose: Response time performance for emergency calls has been used as an indicator of ambulance service quality in England since 1974. It was revised in 1996 with targets set of eight minutes for life-threatening (category A) and 19 minutes for urgent (category B) calls. Internationally, response time has been used as the benchmark for emergency medical services (EMS) performance. The evidence to support use of response times as a quality measure has been examined.

Methods: A rapid review was used to assess the evidence base for the eight minute response time target. Also, a descriptive observational study of the clinical characteristics of category B calls was performed using two months patient report form data from one English ambulance service.

Results: Five papers were identified that have examined the relationship between response time and mortality for 911/999 emergency call populations. Four papers were from the USA, and in all cases no survival benefit was found for response times > 5 minutes even after adjustment for variables including age, sex and illness severity. This finding was replicated in one UK study. The descriptive study examined call characteristics for 26,882 category B calls. Half of the patients received no intervention other than basic vital signs measurement and 75% had assessment only. Twenty-five percent required some clinical intervention with the majority only requiring oxygen. Less than 5% received significant intervention such as drugs, intravenous cannula, or airway management.

Conclusions: With the exception of cardiac arrest there is consistent evidence that response time has no impact on mortality for EMS calls. Alternative indicators of quality of care should be developed that allow less focus on time targets and more effort on innovation and development of services which could better meet the needs of the majority of patients who do not have a life-threatening problem.

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(A78) EMS System Assessment & Gap Analysis

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Purpose: The World Health Organization Model Trauma System Policy suggests that Governments should undertake systematic reviews of the de facto prehospital transport systems for severely ill and injured persons. These systems, be they formal or informal, should be designed to optimize local resources with emphasis on standards of training, equipment, infrastructure and communications so as to assure delivery of prompt, quality, and equitable prehospital care. Scope of Review and Assessment a System Assessment and Gap Analysis (SAGA) tool has been developed to measure 127 key components of a high performance emergency transport system within the realms of Clinical, Organizational and Logistical functionality. The evaluation compares the current status of the specific components with those commonly expected to be seen in a formal international accredited EMS organization.

Methodology: The tool utilizes a thorough investigative process sufficient to produce credible and practical data which can be used to form a “System Improvement Plan.” While the scope of the project can be seen as relatively broad, the assessment process allows for adaptation to a wide variety of EMS system models which bring specific focus to the greatest areas of improvement opportunity with practical applications and alignment with those resources which are available to a given governmental entity.

Presentation: This abstract, (in both oral and poster presentation format), demonstrates a portional mock evaluation with focus on those components often overlooked by both evolving and mature formal system designs by the international EMS community. The SAGA approach is an invaluable tool for those responsible for integrating the functionality and needs of a broad range of stake holders into the overarching prehospital delivery system in building support for qualitative improvements.

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(A79) Where Do Ed Patients Come From?

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A lack of access to primary care services, decreasing numbers of general practitioners (GPs) and free of charge visits have been cited as factors contributing to the rising demand on emergency departments. This study aims to investigate the sources of patients' referrals to emergency departments and track changes in the source of referral over a six-year period in Queensland. Data from Queensland Emergency Departments Information Systems were analyzed based on records from 21 hospitals for the periods 2003–04 to 2008–09. The emergency department data were compared with publicly available data on GPs services and patients attendance rates. In Queensland, the majority of patients are self-referred and a 6.6% growth between 2003–04 and 2008–09 (84.4% to 90% respectively) has been observed. The number of referrals made by GPs, hospitals and community services decreased by 29.4%, 40%, 42% respectively during the six-year period. The full-time workload equivalent GPs per 100,000 people increased by 4.5% and the number of GP attendances measured per capita rose by 4% (4.25 to 4.42). An examination of changes in the triage category of self-referred patients revealed an increase in triage category 1–3 by 60%, 36.2%, and 14.4% respectively. The number of self-referred patients in triage categories 4–5 decreased by 10.5% and 21.9% respectively. The results of this analysis reveal that although the number of services provided by GPs increased, the amount of referrals decreased, and the proportion of self-referred patients to emergency departments rose during the six-year period. In addition, a growth in urgent triage categories (1–3) has been observed, with a decline in the number of non-urgent categories (4–5) among patients who came directly to emergency departments. Understanding the reasons behind this situation is crucial for appropriate demand management. Possible explanations will be sought

and presented based on patients' responses to an emergency department users' questionnaire.

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(A80) Nationwide Study to Improve Door-to-Balloon Times in Patients with Acute ST Elevation Myocardial Infarction Requiring Primary Percutaneous Coronary Intervention Using Prehospital ECG Transmission

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Objective: To reduce nationwide door-to-balloon times (DTB) in patients presenting with acute ST-elevation myocardial infarction (STEMI) requiring primary percutaneous coronary intervention (PCI), by adoption of pre-hospital wireless 12-lead electrocardiogram (ECG) transmission by Singapore's national ambulance service.

Methods: A phased, prospective, before-after, interventional study of all patients who presented to the national ambulance service with the diagnosis of STEMI. In the 'Before' phase, chest pain patients only received 12-lead ECGs on arrival at the Emergency Departments (ED), where diagnosis of STEMI could be made. In the 'After' phase, 12-lead ECGs were performed in the field by ambulance crews and transmitted while en-route to the hospitals. Diagnoses of STEMI was made by on-duty emergency physicians (EP) prior to patients' arrival and PCI activated. Data was collected from ambulance run sheets, ECG transmission logs, EDs and cardiology units.

Results: 451 eligible patients from “Before” and 214 patients from “After” phase were included in the analysis. Median DTB time was 88 minutes in the “Before” and 52 minutes in the “After” phase ($p = 0.0001$). During office hours, median DTB times for 'Before' and 'After' phases were 84 minutes and 47 minutes, respectively ($p = 0.0001$). After office hours, median DTB times for 'Before' and 'After' phases were 95 minutes and 54 minutes, respectively ($p = 0.0001$). There were 11 false positive activations in “Before” phase and one in the “After” phase.

Conclusion: Pre-hospital ECG transmission resulted in significant reduction of DTB time; this effect occurred regardless of whether patients presented to the ED before or after office hours. No increase in false activations was found in the “After” phase. Pre-hospital ECG transmission should be adopted as “standard of care” for all STEMI cases meeting the criteria for PCI.

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(A81) Curing Overcrowding and Boosting Patient Flow in a High Volume, Low Capacity Emergency Department

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Background: Overcrowding afflicts emergency departments (ED) worldwide. The CDC has reported that EDs in the