Uchunguzi means investigation in Swahili and provides a summary of some of the most recent international literature as presented in other leading journals, but with an emphasis on what is relevant to our continent.

Shooting blanks in the war against infections

Antimicrobial resistance is a major problem all over the world due to indiscriminate and inappropriate use of antimicrobials both in healthcare facilities and in communities. The Emergency Centre (EC) serves as a major area where antimicrobial therapy is usually initiated for severe infections. Data on the appropriateness of antibacterial use as well as antibacterial resistance patterns in the EC setting in Africa are usually lacking. A recent prospective observational study from Komfo Anokye Teaching Hospital (KATH) in Ghana randomly sampled 282 patients in the EC from the 1119 patients given antibacterials out of a total of 1942 admitted within the two month study period. This represented a 57.6% prevalence of antibacterial use in the EC. Interestingly, of the sampled patients, 61.7% (n = 174) were on curative antibacterial therapy and 38.3% (n = 108) were on prophylactic therapy. Cefuroxime was the most prescribed antibacterial agent and Doxycycline the least. Seventy percent (n = 196) of antibacterial prescriptions were considered appropriate based on recommendations in the Standard Treatment Guidelines-2010 of Ghana and other international standard guidelines accepted globally and adapted by clinicians at KATH. From specimens taken for culture and sensitivity, the most common isolates were (in order) *Escherichia coli*, *Coagulase Negative Staphylococcus* (possibly contaminants of blood and ascitic fluid specimens), *Klebsiella* spp., *Pseudomonas* spp. and MRSA. Over 70% of the *E. coli* isolates tested were resistant to ceftriaxone, cefuroxime, ciprofloxacin and cotrimoxazole and the *Klebsiella* isolates were resistant to cefuroxime, cotrimoxazole and ceftriaxone. These findings highlight the need to determine local antimicrobial resistance patterns that can be used to inform the development of standard treatment guidelines appropriate for use in the EC. This would minimise morbidity and mortality from infectious diseases as well as the risk of emergence and spread of antimicrobial resistance within hospitals.


The FEAST Paediatric Emergency Triage (PET) score

Mortality in paediatric emergency care units in Africa often occurs within the first 24 h of admission and remains high. At a clinical level, the key challenge facing health services in Africa is precisely how to distinguish those who are at greatest risk of poor outcome, using largely clinical criteria, in order to target parenteral antimicrobials and supportive therapies. Researchers recently identified prognostic factors for mortality in febrile children with signs of shock admitted to emergency care wards in East Africa who had been enrolled into the FEAST (Fluid Expansion as Supportive Therapy) trial, and used them to develop a bedside risk score for mortality, the FEAST Paediatric Emergency Triage (PET) Score. This score which uses 8 clinical variables (temperature, heart rate, capillary refill time, conscious level, severe pallor, respiratory distress, lung crepitations, and weak pulse volume), ranges from 0 to 10 and had an AUROC of 0.82 (95% CI, 0.77–0.87) in the FEAST trial derivation set. It was then validated using data on children admitted to a rural district hospital in Kilifi, Kenya, and had an AUROC of 0.77 (95% CI, 0.72–0.82) amongst admissions to the paediatric high dependency ward.
and 0.86 (95% CI, 0.82–0.89) amongst general paediatric admissions. The FEAST PET score provides a straightforward easy to use guide, uses only clinical variables that are measured at the bedside, does not rely on laboratory tests, and is not limited to children with specific diagnoses, but rather covers different presentation syndromes reflecting the population of children presenting to hospital in the African setting. A low score on this scale indicates a low risk of mortality and a high score indicates a high risk of mortality.


Essential components of emergency care in Africa

A major barrier to successful integration of acute care into health systems is the lack of consensus on the essential components of emergency care within resource-limited environments. The 2013 African Federation of Emergency Medicine Consensus Conference was convened to address the growing need for practical solutions to further implementation of emergency care in sub-Saharan Africa. The goals of the consensus process were to (1) define a core set of sentinel conditions, (2) derive context-appropriate emergency care signal functions from sentinel conditions and (3) use these definitions to create the foundation for a facility-based assessment framework. Over 40 participants from 15 countries participated in the working group that focused on emergency care delivery at health facilities. Levels of emergency care were assigned based on the expected capacity of the facility to perform signal functions, and the necessary human, equipment and infrastructure resources identified. The basic level was defined as a healthcare institution with the ability to provide first response and stabilisation of emergency patients, such as a health outpost. The intermediate level of care was defined as encompassing the knowledge and skills of the basic level in a facility that has sufficient resources to attain intravenous access and establish a definitive airway, though not necessarily the capacity to provide mechanical ventilation. Advanced facilities are those with staff members who have robust knowledge and skills as well as the resources to provide comprehensive emergency services to address sentinel conditions. The workgroup then identified the essential services delivered—signal functions—associated with each emergency care sentinel condition. Emergency signal functions do not include every service that is required, but indicate consensus-based designation of a minimum level of care that should be available. These consensus-based recommendations provide the foundation for objective facility capacity assessment in developing emergency health systems that can bolster strategic planning as well as facilitate monitoring and evaluation of service delivery.


Emergency nursing on the road

An emergency nurse practitioner can be defined as a “nurse practising in an emergency centre who is specifically trained to deal with minor injuries without the need for supervision by a physician”. In South Africa, emergency nursing students need to rotate through various clinical learning environments in order to gain competencies in the emergency environment. This includes the pre-hospital environment which is viewed as an essential clinical learning opportunity because it engenders appropriate clinical exposure. In a recent study, 45 emergency nurses and emergency nursing students in South Africa were interviewed to explore the value that exposure to the pre-hospital environment added to the personal and professional development of emergency nurses. Four main themes emerged from the data. The unpredictable pre-hospital environment provided insight into the various locations and situations where patients may be in need of emergency care. They also learnt more about the various role players within the emergency medical services, specifically the police and fire departments. They realised the value of working together as a team and it became evident to them that functional and precise communication plays a vital role in ensuring effective team work and a safe outcome for the patient. Lastly, the emergency nursing students valued the enhanced learning opportunities to practise specific clinical skills with experienced paramedics and found that they acquired more knowledge and developed a deeper understanding of the mechanism of injury which would also be useful to them in hospital. Based on these findings, it is clear that rotating through the pre-hospital learning environment provides emergency nursing students with fundamentally valuable learning opportunities.


Emergency care in 59 countries

Ebola virus disease, cholera, armed conflict and natural disasters have recently strained systems for the provision of emergency care in low- and middle-income countries (LMICs). Measuring the state of emergency care in LMICs is challenging, because care is delivered through a heterogeneous network of facilities and medical records are often incomplete, even for basic information such as patient identity and diagnosis. A systematic review of all available evidence on emergency care delivery in LMICs identified 195 reports concerning 192 facilities in 59 countries. Most were academically-affiliated hospitals in urban areas. The median mortality within emergency departments was 1.8% (interquartile range, IQR: 0.2–5.1%). Mortality was relatively high in paediatric facilities (median: 4.8%; IQR: 2.3–8.4%) and in sub-Saharan Africa (median: 3.4%; IQR: 0.5–6.3%). The median number of patients was 30,000 per year (IQR: 10,296–60,000), most of whom were young (median age: 35 years; IQR: 6.9–41.0) and male (median: 55.7%; IQR: 50.0–59.2%). Most facilities were staffed either by physicians-in-training or by physicians whose level of training was unspecified. Very few of these providers had specialist training in emergency care. These data highlight the high patient loads and mortality, particularly in sub-Saharan Africa, where a substantial proportion of all deaths may occur in emergency departments. The combination of high volume and the urgency of treatment makes emergency care an important area of focus for interventions aimed at reducing mortality in these settings.
Optimising EMS response times

Response time is currently considered to be an important performance indicator in Emergency Medical Services (EMS) systems. A number of factors may affect response times, including the location of emergency vehicles and the type of response system design used. This study aimed to assess the effects of emergency vehicle location and response system design on response time performance in a model of a large South African urban EMS system, using discrete-event simulation. The research design identified two experimental factors, each with two levels. The emergency vehicle location factor consisted of a centralised (static) level and a decentralised (dynamic) level, while the response system design factor consisted of a single-tier level and a two-tier level. In order to assess the effects of these two factors on response time performance, four individual models (scenarios) were run independently for the same run length and number of replications to produce response time data for comparison. The conceptual model included a description of the emergency vehicle dispatch process logic for high-acuity (Priority 1 – P1) and low-acuity (Priority 2 – P2) incidents. Based on the findings, decentralised/dynamic emergency vehicle location was associated with the best response time performance in both the P1 and the P2 groups. The choice of response system design did have more of an impact on response times across levels of vehicle location for P1 cases than for P2’s. This effect was not evident, however, when considering the proportion of P1 and P2 ‘responses meeting response time targets’. Because pre-hospital emergency care involves the assessment and treatment of patients at the scene of an incident rather than at a fixed location such as a hospital, a localised assessment of the different system designs and models needs to be performed to ensure the right set of emergency vehicles are available for incident response in a timely manner.


Conflict of interest

The author declares no conflict of interest.