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AFEM consensus conference 2013 summary: Emergency care in Africa – Where are we now?

Résumé sur la Conférence de consensus de l'AFEM 2013: Les soins d'urgence en Afrique – Où en sommes-nous à l'heure actuelle?

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Emergencies span all social and specialty boundaries, making an integrated and cross-cutting approach to the management of acutely ill and injured patients essential. Most low income countries lack emergency care systems, and thus suffer the highest rates of morbidity and mortality from acute disease. The second African Federation for Emergency Medicine Consensus Conference was held in November, 2013, in Cape Town, South Africa. Workgroups included: Out of Hospital Care, Emergency Care Integration into Current Health Systems, and Documenting the Regional Burden of Acute Disease. One hundred thirty-five leaders in acute and emergency care representing 32 different countries attended the meeting. Workgroups were tasked with the generation of candidate frameworks to facilitate advocacy, scientific development, and future interventions in these three key areas.

Les urgences dépassent toutes les frontières sociales et disciplinaires, faisant de l'approche intégrée et transversale à la prise en charge des patients souffrant de maladies aiguës et blessés un facteur essentiel. La plupart des pays à faible revenu ne disposent pas de systèmes de soins d'urgence, alors qu'ils connaissent les taux les plus élevés de morbidité et de mortalité liés aux maladies aiguës. Cette seconde conférence de consensus de la Fédération africaine de la médecine d'urgence (AFEM) s'est tenue en novembre 2013, dans la ville du Cap, en Afrique du Sud. Les groupes de travail constitués incluaient notamment les soins extra hospitaliers, l'intégration des soins d'urgence aux systèmes de santé actuels et la documentation du fardeau régional de la maladie aiguë. Cent trente-cinq leaders du secteur des soins aigus et d'urgence représentant 32 pays différents étaient présents à cette réunion. Les groupes de travail ont reçu la tâche d'élaborer des propositions de cadres destinés à favoriser le plaidoyer, le développement scientifique et les interventions futures dans ces trois domaines fondamentaux.

Introduction

Emergencies span all social and specialty boundaries, making an integrated and cross-cutting approach to the management of acutely ill and injured patients essential.[1] Most low income countries lack organised emergency care systems, and thus suffer the highest rates of injury, maternal death due to complications of pregnancy, and acute complications of communicable diseases such as TB, malaria, and HIV.[2] This acute disease burden is further compounded by the rapidly growing prevalence of non-communicable disease, as patients from these countries also suffer the highest rates of mortality from acute complications of chronic diseases.[3,4]

Both out-of-hospital and facility-based emergency care are essential components of the healthcare continuum. The combination of acuity-based triage, rapid intervention, and a syndrome-based approach to undifferentiated patients—which together comprise effective emergency care practice—greatly reduces the morbidity and mortality associated with a range of medical, surgical, paediatric, and obstetric conditions.[5–9]

There is increasing recognition that emergency care system strengthening initiatives are an essential part of addressing the global burden of disease:[10,11] the Disease Control Priorities project estimates that 45% of deaths and 36% of disability in low- and middle-income countries could be addressed by

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the implementation of emergency care systems,[9] and the World Health Assembly has called for its member states to develop "formal, integrated emergency care systems."[12]

AFEM and meeting background

The African Federation for Emergency Medicine (AFEM) represents a broad coalition of national societies, organisations, and individuals from over 25 countries. Amongst its activities, AFEM holds consensus meetings to identify priorities for accelerating the development of acute and emergency care in the region, bringing together non-clinicians, prehospital providers, nurses, and doctors from around the globe. Overall meeting goals include developing strategies to document the current burden of acute disease and foundational goals for emergency care in the region; amplifying evidence-based information sharing via dissemination and discussion of educational, clinical, and operational resources; and promoting the collaboration of leaders and experts in African emergency care in order to strengthen regional emergency health systems. Specific discussion topics are identified for each meeting, and, driven by the resulting consensus-based priorities, AFEM provides data to inform policy-making, generates training curricula for all levels of providers, and creates tools to facilitate documentation of the burden of acute disease.

AFEM's first consensus conference, "Defining the role of emergency medicine in Africa", was held in November 2011. Consensus-based priority setting[13,14] led to meeting outputs that included standard open access curricula for emergency training programmes (an 80-h short course, a 1-year curriculum and a 3-year specialist residency curriculum), with an associated presentation bank and AFEM Oxford Handbook of Acute and Emergency Care.[15] Also based on priority needs identified at the meeting, AFEM has led the development and review of clinical guidelines and operational protocols for several African emergency care sites, and has developed and implemented a standardised clinical chart for capturing essential information on trauma patients.

AFEM's second consensus meeting, Emergency care in Africa: where are we now?, was held in November 2013 in Cape Town, South Africa, with the aim of documenting the regional burden of acute disease and the state of the acute care system.

Meeting process

Based on priority knowledge gaps identified in the 2011 consensus conference, three workgroups were formed during the conference planning period:

- Out of Hospital Care (including prehospital and transfer care).
- Emergency Care Integration into Current Health Systems.
- Documenting the Regional Burden of Acute Disease.

Workgroups were tasked with conducting pre-meeting literature reviews and generating candidate frameworks to facilitate advocacy, scientific development, and future interventions in these key areas.

One hundred thirty-five leaders in acute and emergency care attended the meeting, representing 32 different countries, including 18 African countries. Workgroups were given the same guiding principles as during the 2011 meeting, that recommended interventions should:

- Integrate into existing health systems.
- Prioritise cost-effectiveness.
- Have measureable impacts, and
- Be flexible enough to be scaled and specified to a variety of settings.

Emergency care was again defined as:

The provision of initial resuscitation, stabilisation, and treatment to acutely ill and injured patients, and delivery of those patients to the best available definitive care, regardless of ability to pay.

Out of hospital emergency care

The Out-of-Hospital Emergency Care (OHEC) workgroup convened to create consensus-based position statements on advocacy strategies and regionally-targeted system development mechanisms. Following a broad pre-meeting literature review, the workgroup defined out-of-hospital emergency care as encompassing first responder care, prehospital care, and formal EMS systems, and developed consensus-based definitions of these and other key terms. Finally, the group generated a framework identifying critical components of OHEC (see Fig. 1), and a roadmap to guide advocacy and development of OHEC systems in limited resource settings. Planned priority outputs include an open-source online toolkit that will contain template documents and educational resources to facilitate development and implementation of OHEC.

Emergency care integration into current health systems

A major barrier to successful integration of acute care into health systems is the lack of consensus on its essential components within low resource environments. Two priorities emerged clearly from the 2011 AFEM consensus conference: the need to evaluate the current status of emergency care delivery in Africa, and the need for consensus on essential components of effective emergency care.

Through 2013, AFEM conducted a pre-meeting regional survey on the status of emergency care systems. While the survey had a limited response rate, the data were bolstered by a comprehensive literature review prior to the meeting. The systems workgroup based their approach on the *Monitoring Emergency Obstetric Care* (EmOC) Handbook,[16] using the concept of "signal functions" that have been effective in defining critical emergency obstetric interventions. Signal functions are key medical interventions that, when completed successfully, indicate the existence of a functional system; mitigating the need to assess each individual component of a critical intervention, signal functions represent a culmination of knowledge, interventions, and supplies. For example, effective administration of parenteral antibiotics implies the presence of clinical judgement that the antibiotics are appropriate, the skill to place an IV, and the presence of IV tubing, catheters, and medication. If one component of the signal function is absent, it cannot be accomplished and indicates a deficiency in the system. In this way the use of signal functions limits

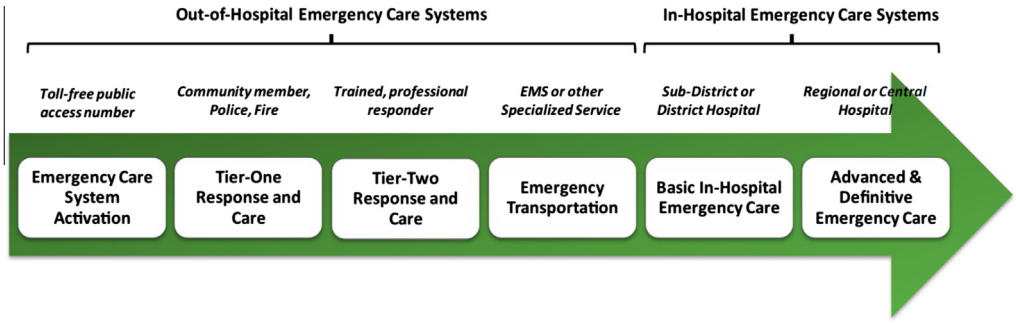

Figure 1 The Emergency Care Continuum.

the number of items that need to be assessed to accurately characterise a system. This concept is particularly applicable to emergency care conditions where a concatenation of events must occur to produce the desired function.

The workgroup agreed first upon the sentinel emergency syndromes that represent acute illness highly likely to progress to death: respiratory failure, shock states, altered mental status, dangerous fever and severe pain (including trauma). Signal functions required for stabilisation and management of each sentinel conditions were agreed upon and were further stratified into levels of care (basic, intermediate and advanced) associated with their performance (Tables 1–3). Resources and technologies essential for the performance of the signal functions were developed and ratified. The compiled data were then used to create a tool that can be used to assess the functional capacity of an emergency care centre and to identify targets for improvement. As with EmOC, the Emergency Care Assessment Tool (ECAT) allows a pragmatic objective evaluation

Table 1 Basic emergency facility clinical care signal functions.

Sentinel condition	Signal function
Respiratory failure	Manual manoeuvres Relief of obstruction Rescue breathing Three-way dressing
Shock *Haemorrhagic/Hypovolemic*	Physical manoeuvres for control of haemorrhage Arterial tourniquet Pelvic wrapping Splinting of fracture
General Altered Mental Status (AMS)	Protect from secondary injury Administer mental status examination Check glucose and/or administer glucose ABCDE interventions, including trauma evaluation
AMS with seizure	Administer PO/PR/IM benzodiazepines
AMS from psychiatric problems	Rule out organic causes of altered mental status Administration of appropriate therapeutics for AMS from psychiatric problems
General severe pain	Administer an analgesic agent Administer aspirin
Abdominal pain	Urine dipstick Oral hydration
Traumatic pain	Splinting of fracture
General trauma	Trauma protocol implementation Administer tetanus vaccination Initial appropriate wound care
Head injury	Protect from secondary injury
Orthopaedic injury	Cervical spine and basic immobilisation (sling, splint, inline immobilisation for spinal fracture) Reduction of fracture in patients with neurovascular compromise
Burns	Cooling care
Dangerous fever	Management of extremes of temperature PO/PR/IM benzodiazepine for ethanol withdrawal

The following were listed as "desirable" to have at the basic level: oral airway insertion, bag valve mask ventilation, placement of Foley catheter for urinary outlet obstruction, and irrigation and closure of clean acute wounds. The term desirable represents an increased capability that augments the probability of a successful outcome of appropriate emergency care.

Table 2 Intermediate emergency facility clinical care signal functions (includes all of the basic tier functions plus the following signal functions).

Sentinel condition	Signal function
Respiratory failure	Insertion of oral airway
	Bag valve mask ventilation
	Needle decompression
	Non-definitive advanced airway with supraglottic device
	Administration of critical therapeutics
	Oxygen administration
	Use of suction
	Definitive advanced airway
General shock	Peripheral percutaneous intravenous access
	Intraosseous access
	Venous cutdown
	IV fluid and medication administration capability
	Administration of critical therapeutics
Haemorrhagic/hypovolemic	Packing and suturing for haemorrhage
Cardiogenic shock	Automated external defibrillation
	ECG interpretation
Obstructive shock	Needle decompression of tension pneumothorax
Distributive shock	Parenteral antibiotics/antimalarials
	Administer IM adrenaline
General Altered Mental Status (AMS)	Check electrolytes
AMS with seizure	Administer parenteral benzodiazepines
	Magnesium sulphate for pregnant patients
	Perform laboratory investigations appropriate to regional disease patterns
AMS from metabolic causes	Insulin for hyperglycaemia
AMS from toxic causes	Administer locally appropriate antidote/antivenom as clinically indicated
Severe pain	
Chest pain	ECG interpretation
Abdominal pain	Placement of Foley catheter for urinary outlet obstruction
	Therapeutic paracentesis
	Access to rapid surgical services
Traumatic pain	Traction splinting
General trauma	Irrigate and close clean acute wounds
Orthopaedic injury	PO or IV antibiotic administration for open fracture
	Fasciotomy for compartment syndrome
Burns	Escharotomy
Dangerous fever	Treat with parenteral antimicrobial agent
	Bedside surgical control (e.g., abscess, D and C)
	Sepsis protocol
	Parenteral therapeutics for sympathomimetic toxidromes or ethanol withdrawal
	Administration of critical parenteral therapeutics

The following were listed as "desirable" to have at the intermediate level: mechanical ventilation, administration of critical therapeutics for BP management in stroke, use of ECG to determine metabolic abnormalities, chest X-ray, ultrasound, and lumbar puncture. The term desirable represents an increased capability that augments the probability of a successful outcome of appropriate emergency care.

and designation of tiers of care based on the capacity for critical service provision, rather than a simple inventory of materials available at a specific facility.

Documenting the burden of acute disease

One of the critical barriers to the targeted dissemination of emergency care identified in the 2011 Consensus Conference was the profound under-documentation of the actual range of acute presentations to health facilities in sub-Saharan Africa. Acute presentations are not well captured in existing surveillance programs, nor are there established algorithms for extracting the disease burden amenable to emergency care from existing data sets. This data gap both masks the profound health impact of the lack of emergency care availability, and hinders attempts to assess, and target emergency care interventions to, regionally-specific needs.[10,17–20]

Prior to the meeting, workgroup leaders conducted a broad literature review to identify diagnoses and chief complaints amongst patients presenting to undifferentiated acute care facilities in the region. The database query and grey-literature review strategy were evaluated and endorsed by the workgroup participants, and additional suggested sources were incorporated. In addition, workgroup participants activated their professional networks to gather relevant unpublished aggregate datasets, which were integrated into the review. Results will be published in the coming months.

Table 3 Advanced emergency facility clinical care signal functions (includes all of the intermediate tier functions plus the following signal functions).

Sentinel condition	Signal function
Respiratory failure	Mechanical ventilation: invasive and non-invasive ventilation Chest tube insertion Surgical airway
General shock	Administration of IV medication requiring advanced monitoring Central venous access Pathogen-screened blood transfusion
Cardiogenic *Obstructive*	Cardioversion Pericardiocentesis
General Altered Mental Status (AMS) *AMS from stroke* *AMS from metabolic causes*	 Administer critical therapeutics for appropriate BP management in stroke Use ECG to determine metabolic abnormalities
Severe pain Chest pain Abdominal pain	Access to definitive surgical services Chest X-ray Ultrasound
General trauma *Chest injury*	Rabies IVIG/vaccination as appropriate Autotransfusion from chest tubes Thoracotomy Chest X-ray
Dangerous fever	Lumbar puncture OT surgical control (deep abscess) Bedside surgical control for empyema

Workgroup discussion centred on optimal mechanisms for prospective capture and characterisation of the acute burden of disease. Participants ratified a working definition of acute disease as encompassing undifferentiated patients with acute complaints presenting to care facilities for unscheduled visits. To identify locations of interest for data-collection, the group endorsed the use of the general term "acute intake area" to capture the broad range of regionally-relevant facilities, including dedicated emergency departments, casualty wards, and acute processing areas within facilities without dedicated emergency care areas. The workgroup agreed that amongst patients meeting the above criteria, the target burden of disease should be independent of acuity, and the goal should be to capture both urgent and emergent presentations.

The workgroup considered the relative advantages of the use of patient chief complaints and provider diagnoses to characterise burden of disease, a discussion that has also recently been documented elsewhere.[20] Provider diagnosis represents a professional synthesis of clinical findings and at times, diagnostic testing, delivered in technical language; it thus has the potential to provide highly consistent and accurate categorisation. Chief complaints, on the other hand, may more effectively characterise the undifferentiated clinical syndromes to which emergency care providers must direct initial evaluation and intervention. In addition, chief complaints are likely less subject to the skew generated by vertical disease-specific funding that may be linked to diagnostic reporting. Workgroup consensus was that a core data set or standardised instrument should capture both chief complaint and diagnosis. In addition, the workgroup endorsed the concept that ratifying or generating a standardised classification system, for both diagnoses and chief complaints, would be essential to the utility of data collection. The group agreed that no list would capture all presentations across the region, but endorsed the criteria that a feasible and useful core list of diagnoses and/or chief complaints would capture 80% of presentations across a wide range of settings.

An additional critical gap that was identified in the 2011 meeting was the absence of consensus on metrics to evaluate the impact of acute care system interventions. There was agreement in this workgroup that basic acute care outcome metrics should be integrated into a facility-based burden of disease surveillance strategy.

Given the interest in a data gathering strategy that would both serve to characterise the burden of acute disease amenable to emergency care, and provide sufficient clinical content to support outcome-based metrics, a proposal was introduced and endorsed by workgroup participants to develop a standardised clinical chart, on the model of the AFEM trauma form. As in the case of the trauma form, this new data collection form would serve as a clinical chart, with data collection elements embedded. Beyond data capture, the instrument would serve as a quality assessment and improvement mechanism by providing a template to guide the early assessment and initial management of acutely unwell patients.

Way forward

The final product of the Emergency Care Integration into Current Health Systems workgroup is a tool that will be used to assess the level of acute and emergency care provided by a healthcare facility. This tool provides information on a facility's existing capacity for acute and emergency care, and also provides administrators and policy makers with concrete information on what resources are needed to improve the provision of care in that facility.

The tool will be piloted in healthcare facilities throughout the region, and will be continually refined during the trial process. Ultimately, the tool will be used along with future evaluation methods to gather comprehensive data on the status of emergency care systems across Africa.

The OHEC workgroup will target the development of a toolkit to serve as a repository of policy and technical documents to further assist the formation, growth, and assessment of out-of-hospital emergency care systems across Africa. The group will also develop a set of priorities for out-of-hospital emergency care research, the products of which will be useful in future advocacy and development efforts.

The Documenting the Burden of Acute Disease workgroup will move forward with the creation of a standard case-based data collection tool that will also serve as a clinical chart. In addition the group will develop or modify and ratify an existing classification system for diagnoses and chief complaint, piloting the system with iterative revision to ensure that it meets the criteria of capturing at least 80% of presentations at a wide range of regional facilities.

Workgroup participants will hold breakaway meetings at the AFEM African Conference on Emergency Medicine in Addis Ababa, Ethiopia, in November 2014 (http://www.afcem2014.com), to further develop the planned workgroup products. The third AFEM Consensus Conference, "Partnerships in Emergency Care", will take place in Cape Town in April 2015 in conjunction with the Emergency Medicine Society of South Africa meeting (www.emssa2015.co.za).

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