

Introduction: The Electronic Health Record (EHR) is now the standard means for recording and maintaining medical notes in most emergency departments. The EHR is an independent cause of physician burnout, and maintenance of the EHR may occupy 30 to 50% of clinical time. There are software solutions available, but they are connected to fixed, expensive, distracting, and bright electronically powered computers. Scribes have been successfully trialed, but are also expensive and attached to computers on wheels. Portable digital word processors in the form of the AlphaSmart Neo is a redundant technology designed primarily for children with typing difficulties. It has recently enjoyed a resurgence in popularity among professional writers, journalists, and field researchers for the ultimate distraction-free writing experience. The Alphasmart Neo is cheap, nearly indestructible, intuitive, and requires almost no recharging. It is compatible with all software across Mac OS, Windows, and Linux. Notes are entered by the clinician or scribe, independently of computers, at the bedside, and uploaded to any software via USB cable.

Aim: To describe the introduction and impact of the AlphaSmart Neo on the EHR in emergency departments across Australia.

Methods: We will examine the role of the Alphasmart Neo in austere, low power, extreme environments with a demonstration on how to enter, maintain, and transfer an electronic health record independent of any computer or power source.

Discussion: We believe the AlphaSmart Neo is an ideal, personalized, cheap, effective, and efficient hardware solution to entering notes independent of other software and hardware. It is distraction free at the patient's bedside, resulting in better notes that the clinician enjoys writing.

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Basic Principles in Complex Humanitarian Emergency: A Pilot Course

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Introduction: The international and national response team faces many challenges during a complex humanitarian emergency. These include difficult organization, an unprepared national disaster plan, and a disrupted political system. Previous studies showed a reactive approach in earlier disasters in Saudi Arabia and the need for greater involvement of health professionals in disaster management. As a result, several medical education and training institutes began to introduce courses which were mainly about Major Incidents Response, but with less attention to Humanitarian Assistance and Disaster Relief. **Aim:** The course provides Basic Principles in Complex Humanitarian Emergency for healthcare providers in the kingdom and is focused on the aspect of community awareness for disaster and humanitarian relief.

Methods: The interactive competencies-based course in Basic Principles of Complex Humanitarian Emergency was

implemented. The course was designed by 5 experts in disaster medicine and humanitarian relief and was piloted over five days at officers club of Minister of Interior in Riyadh, sponsored by King Fahd Security College. The participants (n=30) were from different health disciplines. They completed the pre- and post-tests and presented three pilot workshops for disaster community awareness.

Results: The overall scores were 44.19% for the pre-test and 62.85% for the post-test (Wilcoxon test for paired sample: $z = 3.729$, $p < 0.001$). There were no significant statistical differences among professions of healthcare providers for both pre- and post-tests.

Discussion: Delivering competencies-based course in Basic Principles of Complex Humanitarian Emergency for health care providers can help in the improvement of knowledge and skills for humanitarian assistance and disaster relief in Saudi Arabia, which is important for disaster preparedness augmentation in the kingdom. The next course for the same group may be recommended for achieving the level that will train them to participate in the National Disaster Assistance team.

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Behavioral Health Resource Utilization of Emergency Department Patients Presenting from Mass Gathering Events

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Introduction: Behavioral health needs of attendees at mass gathering events who require emergency department (ED) evaluation are poorly understood. Appropriate resource allocation of mental health staff and other behavioral interventions necessary to support this patient population are also unclear.

Aim: To describe behavioral characteristics and psychiatric resource utilization of patients presenting to a tertiary academic medical center emergency department from mass gathering events.

Methods: Single-center retrospective study evaluating attendees at mass gathering events who presented to a Chicago ED. Electronic medical records for patients presenting between October 13, 2013, and December 31, 2015, were reviewed and descriptive analyses performed.

Results: 209 distinct records were reviewed. Most patients presented from large outdoor concerts (n = 186, 89%). Forty-two (20.1%) reported a mental health complaint at presentation, including concerns related to pre-existing psychiatric disturbances or onset of new symptoms. Twenty-seven of the total cohort (12.9%) endorsed a prior psychiatric history. Thirty-five (16.7%) reported use of prescribed psychotropic medications, including antidepressants, stimulants, mood stabilizers, and others. Diagnostic testing among the total sample included serum ethanol measurement (31.1%), urinary toxicology (25.4%), acetaminophen (6.2%), aspirin (5.3%), and creatine kinase measurements (11%). Computed brain tomography was ordered for 20 patients (9.6%). Twelve patients (5.7%)

received an anxiolytic (lorazepam) and 113 (54.1%) received intravenous fluids. An antipsychotic (olanzapine) was administered to one patient (0.5%). There were no reports of suicidal ideation, but physical restraints for agitation were employed in 13 patients (6.2%). Police consultation occurred in 10 cases (4.8%). No formal psychiatric consultations were requested by ED providers.

Discussion: Patients presenting to the emergency department from mass gathering events frequently endorse behavioral complaints requiring directed use of diagnostic and other emergency department resources for their ailments. The need for physical restraints and limited use of anxiolytics and antipsychotics in our sample suggest that psychiatric consultation is underutilized.

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The Birth and Growth of the National Ambulance Service in Ghana

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Introduction: This study aimed to document the growth and challenges encountered in the decade since inception of the National Ambulance Service (NAS) in Ghana, West Africa. By doing so, potentially instructive examples for other low- and middle-income countries (LMICs) planning a formal prehospital care system or attempting to identify ways to improve existing emergency services could be identified.

Methods: Data routinely collected by the Ghana NAS from 2004–2014 were described, including: patient demographics, reason for the call, response location, target destination, and types of service. Additionally, the organizational structure and challenges encountered during the development and maturation of the NAS were reported.

Results: In 2004, the NAS piloted operations with 69 newly trained emergency medical technicians (EMTs), nine ambulances, and seven stations. The NAS expanded service delivery with 199 ambulances at 128 stations operated by 1,651 EMTs and 47 administrative and maintenance staff in 2014. In 2004, nine percent of the country was covered by NAS services; in 2014, 81% of Ghana was covered. Health care transfers and roadside responses comprised the majority of services (43%–80% and 10%–57% by year, respectively). Increased mean response time, stable case holding time, and shorter vehicle engaged time reflect greater response ranges due to increased service uptake and improved efficiency of ambulance usage. Specific internal and external challenges with regard to NAS operations also were described.

Discussion: The steady growth of the NAS is evidence of the need for Emergency Medical Services and the effects of sound planning and timely responses to changes in program indicators. The way forward includes further capacity building to increase the number of scene responses, strengthening ties with local health facilities to ensure timely emergency medical care

and appropriateness of transfers, assuring a more stable funding stream, and improving public awareness of NAS services.

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Blockchain Technology for Disaster and Refugee Relief Operations

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Introduction: Blockchain is a distributed ledger technology for storing and transmitting information (value) that is secure, verifiable, and auditable. Two specific use-case opportunities exist, identity management and payment systems.

Aim: A secure and auditable solution for disaster refugee support.

Methods: Gap analysis, literature search, and synthesis using existing technologies.

Results: Strategy foundation: A blockchain identity management system that utilizes the Hyperledger Fabric framework; identification on a large scale, in a distributed model that provides immutable record capabilities to prevent fraud, with the ability to incorporate biometrics and DNA; deploy applications that will provide supply-chain capabilities; cryptocurrency for recipients and other relief functions for refugees/disaster victims; components such as consensus, membership services, and Smart Contracts; cloud-based, with redundancies in multiple vendors and additional complex government cloud requirements/certifications, leveraging NIST 800–53 by utilizing a hybrid public permissions architecture.

Discussion: There are an estimated 68 million refugees worldwide at any time. Valid identification is needed by most refugees to qualify for government or international donor relief. That identification is crucial in getting refugees and victims access to the aid supply chain. Blockchain stores data on a large number of computer nodes connected over the Internet. Each node contains an identical copy that is time-stamped and protected by a cryptographic technique called hashing, and control is decentralized. This blockchain strategy will revolutionize the way the government manages the \$30 billion in foreign aid to refugees. It will build upon the identities established to deploy applications that will provide supply-chain capabilities, cryptocurrency for recipients, and other relief functions for refugees/disaster victims. Stakeholders beyond government will also benefit tremendously. The distributed nature of our application will provide visibility to NGOs, nonprofits, host nation stakeholders, and other relief organizations. A single system that provides information to everyone involved will almost instantaneously change the face of relief.

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