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Introduction: Low and middle-income countries (LMICs) bear a disproportionately high burden of sepsis, contributing to an estimated 90% of global sepsis-related deaths. Critical care capabilities needed for septic patients, such as continuous vital sign monitoring, are often unavailable in LMICs.
Aim: This study aimed to assess the feasibility and accuracy of using a small wireless, wearable biosensor device linked to a smartphone, and a cloud analytics platform for continuous vital sign monitoring in emergency department (ED) patients with suspected sepsis in Rwanda.
Methods: This was a prospective observational study of adult and pediatric patients (≥ 2 months) with suspected sepsis presenting to Kigali University Teaching Hospital ED. Biosensor devices were applied to patients' chest walls and continuously recorded vital signs (including heart rate and respiratory rate) for the duration of their ED course. These vital signs were compared to intermittent, manually-collected vital signs performed by a research nurse every 6-8 hours. Pearson's correlation coefficients were calculated over the study population to determine the correlation between the vital signs obtained from the biosensor device and those collected manually.
Results: 42 patients (20 adults, 22 children) were enrolled. Mean duration of monitoring with the biosensor device was 34.4 hours. Biosensor and manual vital signs were strongly correlated for heart rate (r=0.87, p<0.001) and respiratory rate (r=0.74 p<0.001). Feasibility issues occurred in 9/42 (21%) patients, although were minor and included biosensor falling off (4.8%), technical/connectivity problems (7.1%), removal by a physician (2.4%), removal for a procedure (2.4%), and patient/parent desire to remove the device (4.8%).
Discussion: Wearable biosensor devices can be feasibly implemented and provide accurate continuous vital sign measurements in critically ill pediatric and adult patients with suspected sepsis in a resource-limited setting. Further prospective studies evaluating the impact of biosensor devices on improving clinical outcomes for septic patients are needed.

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Hospital Information Technology Considerations for No Notice Disasters

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Introduction: Modern hospital systems are highly dependent on computerized information technology (IT) systems. The integration of laboratory and radiology ordering and resulting cannot be easily replicated with a "paper" processes. This poses challenges for no-notice events, where the rapid registration of patients is a must for effective clinical care. This weakness in hospital response has been demonstrated in events such as the Boston Marathon bombing, the Aurora Theater (to be discussed), and Las Vegas shootings.
Aim: To discuss lessons learned in configuring IT systems for disasters.
Results: A integrated system of IT system preparation was implemented at the University of Colorado Hospital. This system has been demonstrated to be effective in multiple real-world events.
Discussion: Four areas of IT preparedness are needed for hospital IT response to disasters. First is rapid disaster registration with prepared disaster medical record numbers and packets. The medical records must be active in the hospital IT environment, and a visit or case number must be preassigned or rapidly generated. The medical record number alone in the IT environment will allow the initiation of test ordering. The packet should include preprinted labels, a demographic data sheet, and downtime charting and ordering forms. The second item for response is templated order sets to allow rapid ordering of multiple studies such as laboratory, and especially radiology, without having to reenter clinical information. The third is a method of patient care charting scalable, from paper to electronic, depending on the patient volume, acuity, and workstation access. The fourth is a method for patient care in the IT downtime in a disaster setting. Simple inexpensive measures will allow rapid placement of patients in the IT environment and therefore allow rapid and accurate test ordering and resulting.

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Prehospital Advanced Resuscitation with Video Direct Medical Control Using Mobile Smart Device

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Introduction: The prognosis for out-of-hospital cardiac arrest (OHCA) remains controversial if a smart device or video is used. In this study, a system was used that provides advanced cardiac life support (ACLS) with direct medical control through remote video calls for OHCA patients. The study investigated how this system will improve survival.
Aim: The effect of video remote direct medical control using a mobile smart device for cardiac arrest was the main objective of this research.
Methods: Medical origin OHCA patients over 18 years old for one year were included in the video remote direct medical attempt. Trauma, intoxication, environmental origin, and family disagreement were excluded. The advanced field resuscitation was performed by paramedics with video communication-based medical direction, who were dispatched simultaneously by two ambulances. Video communication was performed by a mobile