

# Abstracts of Oral Presentations-WADEM Congress on Disaster and Emergency Medicine 2019

## TECHNOLOGY

### A Backup System for Clinical Information after the Great East Japan Earthquake and Tsunami

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**Introduction:** On March 11, 2011, the Great East Japan Earthquake and Tsunami hit the northeastern part of Japan, causing 15,895 deaths and 2,539 missing persons as of March 1, 2018. Moreover, many medical facilities were destroyed, resulting in the loss of medical information stored in paper records or on servers in hospitals and clinics.

**Aim:** To highlight the need for a backup system for saving all clinical information during disaster preparation.

**Results:** In 2012, a prefectural medical network system - the Miyagi Medical and Welfare Information Network (MMWIN) - introduced a cloud backup data storage service for disasters. This system facilitates the sharing of clinical data among hospitals, clinics, pharmacies, and other care facilities. The backup system is based on the Standardized Structured Medical Information Exchange (SS-MIX), which enables data from medical record systems, developed by different vendors, to be stored in a common format. By the end of September 2018, the total backed up clinical data, including patients' basic information, disease names, blood tests, and prescription list, reached 370 million items from 11.2 million persons. We renewed the system last year and initiated an image data sharing service this year. The number of facilities within the MMWIN was 948, while the number of opt-in patients exceeded 80,000.

**Discussion:** Although the project was financed by the government, a usage fee was collected from the participating facilities. To sustain this project, it is crucial to improve the balance between cost and income by increasing the number of participating facilities and decreasing maintenance cost. Thus, our clinical information backup system for disasters facilitates information sharing among medical facilities.

*Prehosp. Disaster Med.* 2019;34(Suppl. 1):s85

doi:10.1017/S1049023X19001766

### Exploring the Feasibility of Wearable Technologies to Provide Interactive Telepresence Sub-Specialist Support to Remote Clinicians Treating Patients with Traumatic Injuries

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**Introduction:** Some patients presenting to rural or regional hospitals may be deteriorating so rapidly that emergency procedures might be necessary before transfer to specialist facilities. Such interventions might include placement of an ICC, establishing a surgical airway, evacuation of an EDH, laparotomy, or intra-abdominal packing. The treating clinician may have had little or no experience in the procedure. Interactive telepresence technology offers further point of care support to the treating clinicians through the virtual presence of a specialist from a major trauma center.

**Aim:** To explore the feasibility of wearable interactive telepresence technology that can provide sub-specialist support to remote clinicians treating patients with traumatic injuries.

**Methods:** Thirty-seven wearable near-field display devices and annotation software applications were tested against a set of pre-specified technical and user experience requirements. A shortlist of three devices and two software applications underwent usability evaluations with a convenience sample of 24 junior clinicians and sub-specialists. The junior clinicians trialed the wearable devices and the sub-specialists trialed the annotation applications in three simulated trauma scenarios. Measures included participants' ratings of acceptance and workload, technical issues encountered (e.g. frequency of call drop-outs), and anecdotal comments.

**Results:** Participants' subjective ratings of the solutions and anecdotal feedback were positive. However, there was no clear solution that satisfied the functionality and ease-of-use requirements for all participants. For example, the solutions that were rated more favorably by the junior clinicians were rated less favorably by the sub-specialists, and vice versa.

**Discussion:** This work provided preliminary evidence of the feasibility and usefulness of interactive telepresence technology in healthcare. A second phase of usability testing is currently underway to explore additional device and software combinations, including those with augmented reality functionality. Future phases of the project will evaluate the solutions under higher-fidelity conditions followed by in-situ trials across selected regional centers.

*Prehosp. Disaster Med.* 2019;34(Suppl. 1):s85

doi:10.1017/S1049023X19001778

### Feasibility and Accuracy of a Wearable Biosensor Device for Vital Sign Monitoring in Septic Emergency Department Patients in Rwanda

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