

South African trauma center launches portable electronic trauma health record application

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Electronic health records (EHRs) have become standard practice throughout hospitals in North America, but in countries with fewer resources many front-line clinicians are still collecting data on paper, if they are collecting it at all. But now, surgeons from Vancouver, British Columbia, have developed a way for their peers at a Level I trauma center in South Africa to accurately collect and analyze trauma care data via an iPad app. The study is published in the January issue of the *Journal of the American College of Surgeons*.

Traumatic injuries are among the world's top public health problems. Each minute, at least nine people die from an accidental or violent injury, reports the U.S. Centers for Disease Control and Prevention,*and 90 percent of trauma deaths occur in low- and middle-income countries where injury surveillance is not accurately performed.

Moreover, the global medical community has been more focused on infectious diseases, even though [traumatic injuries](#) account for more deaths than HIV, tuberculosis and malaria combined, according to Morad Hameed, MD, MPH, FACS, FRCSC, associate professor of surgery and critical care medicine at the University of British Columbia, and a trauma surgeon at Vancouver General Hospital.

"People think injuries are accidents, and nothing can be done," Dr. Hameed said, "but most injuries are preventable. With the right data and

the right health care standards you can make a favorable impact."

Access to the right data starts with having the right tools. Groote Schuur Hospital in Cape Town, South Africa, provides superb clinical care to the 10,000 patients seeking trauma services each year, Dr. Hameed said, but they were collecting admissions data on paper. No data were being collected on procedures and patient outcomes.

The first step for Dr. Hameed and his team was to help redesign Groote Schuur Hospital's one-page patient admission record. Although the information would still be captured on paper, the new electronic Trauma Health Record record (eTHR), included fields about injury prevention, procedures, and quality of care. It also included a carbon copy that could be torn off the back and sent to the hospital's data collection office.

A year later, when Dr. Hameed and his team returned to Cape Town in 2011, the Groote Schuur surgeons had collected 10,000 admissions records, a full year's worth of patient data. "We knew the new forms worked, but a shortcoming was that it took three months for a grad school student to transcribe all the forms into the database," he said.

In 2012, Dr. Hameed and his team worked with an advisory group of trauma clinicians, data ethnographers, and medical software designers to convert the form into an iPad app. The goal was to ensure that completing the iPad record did not impede clinical workflow and integrated other helpful elements such as safety checklists, evidence-based guidelines, and the ability to easily print, download, and upload the record to a clinical database.

The iPad record captured important information that could be used for later analysis, such as past medical history, residence, demographics, the cause of the injury, the injury severity score, and the patients' drug and alcohol use.

Instead of using the full-sized iPad, Groote Schuur surgeons opted for the iPad mini, which could fit in their lab coat pockets and reduce the risk of theft.

After usability testing, the Groote Schuur Hospital surgeons used the iPad app to capture admissions data for 50 patients who came to the hospital during June 2013 for [trauma care](#) for conditions that included limbs that required amputations; gunshot wounds to the head, neck, chest or abdomen; facial burns, and traumatic cardiac arrest.

Dr. Hameed said it took surgeons about 10 to 12 minutes to complete the iPad record, versus 10 minutes or less on paper. Surgeons were then able to upload the data to a server that created a trauma patient registry. "Even though it takes as long or slightly longer on an iPad, the database is very clean and doesn't require a lot of data cleanup," Dr. Hameed said.

Afterwards, Dr. Hameed's team and the Groote Schuur surgeons were able to analyze the data to look for patterns. The data showed that injuries were concentrated in lower income areas and most of the causes of injury were intentional. The predominant injury population was young males. "Of course you know that if you're there," he said, "but now you can quantify it."

Quantifying such data is what can lead to policy interventions, such as determining which highway intersections need traffic lights and which populations should be the target audience for injury prevention programs.

The iPad patient record is now standard practice at Groote Schuur. It has been expanded to include an operations record on which procedures patients receive, and in January 2014, it is being expanded to include a surgical outcomes record.

After this eTHR study won the first-place award for clinical research at the 2013 American College of Surgeons Committee on Trauma meeting, peer surgeons have begun asking Dr. Hameed and his team about other uses for the iPad patient record.

"Natural disasters could be a brilliant application for its use as well," he said. For example, with conflicting reports about injuries and deaths during the recent typhoon in the Philippines, a tool like this could help humanitarian medical brigades collect more definitive data on the injury and death tolls.

"As long as they can set up portable Wi-Fi or access the Internet through cell phone towers," Dr. Hameed said, "this type of application is all within the realm of possibility."

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