

Japanese Relief Effort Tracks Blood Pressure In Evacuees Remotely

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Several mobile health technology vendors joined together earlier this year to sponsor a cardiovascular disease prevention program for evacuees who survived the devastating March 11 earthquake and tsunami in Japan.

The natural disaster killed thousands of people and destroyed more than 100,000 households.

The Disaster Cardiovascular Prevention Network (D-CAP) was developed by Kazuomi Kario, chairman of cardiovascular medicine at Jichi Medical University in Tochigi, Japan, to remotely monitor the blood pressure of evacuees at a camp in Minami-Sanrikucho on the northeastern Oshika Peninsula.

Experience from a 1995 Japanese earthquake showed that 14% of fatalities were due not to the initial impact, but rather came after victims had survived the event, said Masatake Eto, director and managing executive officer of Tokyo-based device maker A&D Medical, at a July 27 telemedicine policy summit in Washington, D.C.

Unless clinicians took action soon after this year's disaster, he explained, the fear was that more people would pass away later, as well.

When A&D Medical received a request from Jichi Medical University to organize a special medical support team, Eto said, the company enlisted the help of several fellow members of the Continua Health Alliance, which is working to create internationally-recognized interoperability standards for mobile health.

"We had a team up and running almost in a week," Eto said.

A&D contributed clinical and consumer blood pressure monitors to the project. Additional team members included project coordinator Intel; Qute Corp.; Ryoyo Electro Corp.; Toppan Forms; Alive Inc. and Panasonic.

"Interoperability was guaranteed because the members were Continua members," Eto said.

The D-CAP team's mission was to find a way to allow the university's medical staff to remotely monitor the blood pressure of the evacuees and to provide timely advice to the doctors at the disaster site, which went without basic infrastructures such as electricity, water and sewer for the first three months



Photo: A&D Medical

Volunteer clinicians from Jichi Medical University help screen Japanese earthquake evacuees to find those at most immediate risk for hypertension and cardiovascular events.

following the earthquake. (See "Device Industry Evaluating Impact Of Japan Catastrophe" - "The Gray Sheet" March 21, 2011.)

Access to patient medical records was also compromised because of the natural disaster, Eto said.

In the program, evacuees went through an initial medical exam to measure patient risk. Those whose systolic blood pressure was over 180 mmHg were registered in the D-CAP program for regular monitoring; those whose symptoms persisted were evaluated by physicians and given oral medications as indicated.

Registered patients received electronic identification cards and measured their own blood pressure at fully automated blood pressure stations within the camp. The patient-identified results were then sent via wireless communication to a data server near Tokyo.

"Imagine all the infrastructure of the Internet also has been lost," Eto explained.

Clinicians at Jichi Medical University, about 200 kilometers away from the evacuation camp, monitored the blood pressure data and called the physicians on site when they spotted any irregularities.

And when high-risk patients moved from the evacuation camp into temporary housing provided by the government, D-CAP supplied them with individual blood pressure monitors. The units store a month's worth of blood pressure readings that can be downloaded when the patient brings it to the hospital; from there, the information is uploaded to the program's data center.

For future programs, Eto envisions that patients will have their own wireless data gateways installed in their homes, but they were not included in the D-CAP program this year because of the loss of infrastructure and the costs involved.

Evacuation Camps Can Pose Health Risks

Following an earthquake and tsunami, medical relief efforts typically first address more immediate concerns, such as wounds, bleeding and fractures, Eto said.

However, he noted, "medical needs change as time passes."

Risk Factors For Cardiovascular Events

Living in an evacuation camp following a natural disaster contributes several risk factors for hypertension. For example:

- Lifestyle changes can cause the body to store more salt or become salt-sensitive.
- Salt intake increases due to limited types of available foods.
- Physical activity decreases.
- Limited water intake can lead to dehydration.

Victims of such natural disasters, especially those living in evacuation camps, must be monitored for infection and mental health conditions such as post-traumatic stress disorder or depression, Eto explained.

The environmental changes that come from living in an evacuation camp can also contribute to cardiovascular disease, he added. For example, the stress that arises from the significantly altered lifestyle can cause evacuees to store more salt at the same time their salt intake is likely to increase due to decreased access to fresh foods.

Also, physical activity tends to decrease within an evacuee camp, especially among older people, Eto noted. And since it is less convenient to drink water or use the toilet, people tend to get dehydrated.

"All these lead to blood pressure elevation or even blood clotting," he said.

Because many evacuees choose to keep to themselves in very confined spaces following a disaster, Eto said, it is easy for them to suffer "economy class syndrome," or deep vein thrombosis.


Other cardiovascular events that D-CAP sought to prevent

Participating Technology Companies

These companies provided technology and technical support for the D-CAP program:

- A&D Medical (automatic blood pressure monitors)
- Alive Inc. (**Gateway** firmware)
- Ryoyo Electro Corp. (data server)
- Panasonic (PCs)
- Toppan Forms (patient ID cards and ID reader)
- Qute Corp. (web application development)
- Intel (project coordination)

were stress-induced cardiomyopathy, stroke, sudden death and cardiac failure.

Eto said he hopes the program can serve as a benchmark not only for future relief programs, but also for clinical disease management. 

FDA Recalls List - July 27, 2011

CLASS II

Condyle Kit with Haxalobular Discovery Elbow System

Manufacturer: Biomet Inc., Warsaw, IN.

Recalled by: Manufacturer, by letter dated May 25, 2011. Firm-initiated recall is ongoing.

Distribution: Nationwide and Japan; 10 kits.

Reason: The firm initiated this recall after becoming aware that a Discovery Condyle Kit with Hexalobular contained two male condyles instead of a male and female condyle.

Recall number: Z-2660-2011.

Elekta Impac Software Sequencer Verify & Record System

Manufacturer: Impac Medical Systems Inc., Sunnyvale, CA.

Recalled by: Manufacturer, by letter on March 10, 2011. Firm-initiated recall is ongoing.

Distribution: Nationwide and Canada; 840 units.

Reason: There is a problem in the database conversion program that is used when upgrading from the Multi-ACCS to MOSAIQ or from one version of MOSAIQ to another. If the gantry start angle is incorrect prior to pressing beam-on, the patient will be mistreated.

Recall number: Z-2662-2011.

Sequoia Final Driver Closure Top Retention

Manufacturer: Zimmer Spine Austin Inc., Austin, TX.

Recalled by: Zimmer Inc., Warsaw, IN, by letter dated April 4, 2011. Firm-initiated recall is ongoing.

Distribution: Nationwide, Czech Republic, Denmark, France, Singapore, Spain, Switzerland, and United Kingdom; 505 units.

Reason: A rounded or partially rounded tip on the screwdriver may not provide the required locking torque to lock the closure top to the polyaxial screw. When the hex tip of the screwdriver is not fully engaged and/or the screwdriver is used off axis, the hex tip of the screwdriver can become rounded or partially rounded.

Recall number: Z-2705-2011.