

Spotlight on Medical Alarms in Home Healthcare

What happens if a medical alarm sounds in a home, and the patient or caregiver doesn't know what to do? What if a patient and their caregiver are visually or hearing impaired? These are among the many issues to consider when placing medical devices with alarms into the home environment.

"Many patients already have a lot of anxiety regarding their illness, and placing medical equipment into their homes could add to this stress," says Emily Seto, a manager and biomedical engineer for the Centre for Global Health Innovation, University Health Network in Toronto, Canada. "If false or unnecessary alarms are sent, then patients could lose confidence in using the medical equipment or suffer extra anxiety."

Finding the right balance between maximizing safety and minimizing undue patient anxiety can become complicated. It takes good planning from not only clinical professionals but also manufacturers who must take into account new challenges when designing alarms for home devices. The issue of medical alarms in the home environment is especially critical because of the changing nature of healthcare with more patients being treated at home. In fact, home healthcare is one of the fastest growing markets in the healthcare industry.

One problem is how to respond to an alarm. "Should the patient go to the emergency department or call 911?" Seto asks. "It's sometimes difficult to determine a protocol that patients should follow, and then to train or educate the patient on this protocol."

Also, should healthcare providers be alerted when a home alarm goes off? "This brings its own challenges because the healthcare system is usually not prepared for such alarms," Seto says. "It is often difficult to even determine who should respond to these

alarms, especially if the alarms could be generated 24 hours a day."

Another challenge is the alarm itself. Most of the people who are using home devices are the patient themselves. These patients could be confused, visually impaired, or hard of hearing. "Standard audio and visual alarms may not be heard and seen by those with hearing and visual impairments," says Frank Block Jr., a retired anesthesiologist who is active in standards work related to medical alarms.

The patient's caregiver, who in many cases is a spouse or family member, could be equally impaired or unavailable to hear the alarm. "Caregivers may be in another room in a house or apartment," Block says. "Or there may not be a caregiver on the premises. If the alarm sounds, who will hear it?"

Block adds that another challenge is many devices have different controls, displays, and especially alarms. The various interfaces and combined noises from these devices can be overwhelming.

Finding Solutions

Manufacturers can help to solve some of the problems with alarms in home health devices, starting at the device design process, Seto says. Gathering input from the clinicians and patients when during the design process is key.

Standardizing the user interface across numerous device types is another goal that manufacturers should look to, Block says. Home healthcare equipment should at least be re-designed to address patients or caregivers who are hearing or visually impaired, he adds.

The experts recommend that every hospital create protocols on how to respond to home-generated alarms, and these protocols should be developed prior to placing a device in the home. The alarm could alert "first responders over existing emergency networks and through a device that most individuals have in their homes: the telephone," says John Zaleski, chief technology officer at Nuvon, software and hardware firm, in San Francisco, CA. Video and audio remote monitoring could also help clinicians and nurses determine the extent of the alarm and the condition of the patient, he says.

In the end, whatever solutions are implemented should help to ease the stress on the patient, Seto says, not compound it. ■



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