# Could wearable tech address issues caused by overcrowding in emergency departments?

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It isn't surprising that when hospital emergency departments become overcrowded, care becomes more fragmented, but a recent study by University at Buffalo researchers has found that technologies designed to track and eventually improve staffing levels must be judiciously chosen.

That's the conclusion of a study published in the *Journal of Emergency Nursing* by Jessica Castner, Ph.D., president of Castner, Incorporated and Heidi N. Suffoletto, MD, clinical assistant professor of emergency medicine and orthopaedics in the Jacobs School of Medicine and Biomedical Sciences at UB and a physician with UBMD Emergency Medicine and UBMD Orthopaedics and Sports Medicine.

Over four weeks, radio-frequency identification (RFID) tags were worn by doctors and nurses in a busy, urban teaching hospital Emergency Department (ED). The introduction of wearable technology was motivated by a desire by clinical staff and the hospital to track and improve staffing when occupancy in the ED rises.

The goal was to see if wearable technologies that featured radio-frequency identification tags could accurately measure clinician-patient contact and to examine how emergency department occupancy affects the amount of time doctors or nurses spend with patients.

## Public health crisis

Castner called emergency department crowding "a public health crisis" that can interfere with patients getting the right treatment at the right time.

"We found subjectively that an overcrowded Emergency Department does interfere with the ability to stay on task, with a particular patient as there are more variables and more patients," said Suffoletto.

The study found that attending-physician care became increasingly fragmented as occupancy increased, but it only amounted to a 4 percent difference in variability in how many encounters physicians had with patients compared to times when the ED wasn't crowded.

## More frequent interruptions

While the total amount of time at the bedside didn't change when the ED was crowded, the study found that time at the bedside was marked by more frequent interruptions and brief in-and-out visits.

"Time and motion studies like the one we implemented put numbers to where people (or things) are and for how long," Castner said. "These types of studies provide important information on workflow and give insight into potential improvements."

The researchers found that using a device to track workflow can be helpful but the device that was used in the study had certain limitations. It didn't work well in all treatment areas, often because of the built environment in the ED, including rooms with three walls, glass enclosures and frequent foot traffic.

"We learned that objective, third-party testing of new devices at a specific site can speed improvements and save the hospital or public health department purchaser from a poor fit," Castner explained.

She noted that by choosing a different device, tracking information can be used to make more appropriate decisions, such as safer staffing levels. RFIDs can also be placed on equipment in the ED to ensure that it can be located quickly and doesn't leave the department when it is needed most.

Ultimately, such changes should also impact the quality of care, Suffoletto said. "If interactions are interrupted or fragmented, patients recognize that they may not have the full attention of the physician/provider and feel that they are not being thoroughly heard," she said. "This can lead to barriers with establishing trust, which can, in turn, impact care."

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