

Researchers find infrared thermal detection systems useful for patient screening

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Researchers at the University of Nebraska Medical Center (UNMC) found an Infrared Thermal Detection System (ITDS) to be a fast and effective fever screening tool in clinical settings during the H1N1 influenza pandemic. The ITDS detected fever in patients through split-second, non-contact skin temperature measurements. Fever is a primary symptom of seasonal influenza, H1N1, avian influenza, SARS and other infectious diseases.

The results of the study were presented at the Fifth Decennial International Conference on Healthcare-Associated Infections in Atlanta.

Dr. Angela Hewlett and her colleagues evaluated the OptoTherm ThermoScreen in the Emergency Department of The Nebraska Medical Center, UNMC's hospital partner during the height of the H1N1 pandemic from November 18, 2009 to January 9, 2010 to test the tool's viability in a practical clinical setting. The ITDS employs a [thermal imaging](#) camera to measure [skin temperature](#) by detecting and quantifying the infrared energy being emitted from the face. The ITDS temperature measurements were compared with standard temperature measurements for 566 patients, ages 15 days to 89 years old.

Infrared Thermal Detection Systems have been used in several countries to screen for fever in travelers. Dr. Hewlett and her team wanted to utilize the technology as an infection control option in a clinical setting. "The purpose of fever screening is to protect patients," said Dr. Hewlett, assistant professor of [infectious diseases](#) at UNMC. "This technology

allows clinicians to rapidly screen people for fever, so that incoming patients and visitors who may be ill can be identified quickly and reduce the danger of spreading diseases like influenza to other people in the hospital."

During the study period, participating patients at the Emergency Department had their temperature measured by the ITDS and then by routine oral or rectal temperature measurements taken in the triage area of the Emergency Department. Patients who were identified with fever were managed with routine protocols, including separation or surgical masks.

The ITDS proved to be an effective [screening tool](#) for identifying patients with fever ($>100.0^{\circ}\text{F}$) across all age ranges and genders. While the ITDS had a high negative predictive value—correctly excluding most patients without fever—the machine also generated a high percentage of false positive results, measuring higher temperatures than routine temperature measurements. According to the study, if fever was not detected by the ITDS, then there was a 97% chance that there was no fever present, making the ITDS a useful tool for quick fever screenings.

Dr. Hewlett cautioned that their study used mostly oral temperature measurements as the standard to measure the effectiveness of the ITDS. Oral measurements are not always an accurate measure of temperature, but represent the most widely used measurement of temperature in clinical settings. Further evaluation of the performance and utility of the device is needed.

"In this age of globalism, where infectious diseases can rapidly impact worldwide populations, technology such as this can be beneficial to help healthcare professionals quickly screen large numbers of patients with speed and accuracy and implement relevant measures to prevent further disease transmission," said Cathryn Murphy, RN, PhD, CIC, APIC's

2010 President.

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