

The Role of Single-Use, Disposable Thermometers in Infection Control & Patient Care

An Executive Summary

“Annually, 2 million patients suffer with healthcare-associated infections (HAIs) in the USA, and nearly 90,000 die. The overall direct cost of HAIs to hospitals ranges from \$28 to \$45 billion.”

– *Economic burden of healthcare-associated infections: an American perspective*, by Patricia W. Stone, PhD, FAAN, published in the journal *Expert Review of Pharmacoeconomics & Outcomes Research*

The Implications of Thermometers Use in HAIs

Multi-patient reusable thermometers have been shown to be vectors for pathogens, which can spread throughout a health care facility. When thermometers are used on multiple patients by health care providers, the potential for transmission of pathogens from patient-to-patient and patient-to-provider increases. Even with the most stringent cleaning and sterilization protocols, it is nearly impossible to ensure a contaminant-free device for each use.

The problem of HAIs is complex, and its human toll tragic. For health care systems the associated financial costs have crippling ramifications, including reductions in Medicare reimbursement for hospitals that score in the bottom quartile on CMS-mandated Hospital-Acquired Conditions (HAC) reviews.

Single-use, disposable thermometers are integral part of the solution because they virtually eliminate the chance of pathogen transfer via the thermometer. Accuracy of the thermometers has also been shown to be a critically important factor in patient treatment and care. Single-use, disposable thermometers provide the best combination of accuracy and infection control. Non-contact thermometers have implied infection control benefits, but they are less accurate and in many cases, not recommended for clinical use.

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Key Findings from Independently Researched, Published Articles and Studies

“...[The study showed the] potential for shared electronic thermometers to contribute to pathogen transmission” and “[the findings] provide support for the recommendation that single-use disposable thermometers [be used]...”

– June 2018 article in the *American Journal of Infection Control* by Curtis J. Donskey, MD et al. ¹

“[An emerging, multidrug-resistant pathogen, *Candida auris*] was found to be linked to reusable axillary temperature probes, indicating that this emerging pathogen can persist in the environment and be transmitted in health care settings.”

– October 2018 study in the *New England Journal of Medicine* ²

“Replacement of electronic rectal thermometers with disposables, can reduce the incidence of CDI.”

– 2017 Update of clinical guidelines issued by the Society for Healthcare Epidemiology (SHEA) and the Infectious Diseases Society of America (IDSA) ³

“24% of healthcare workers carry *C. diff* on their hands after disinfecting.”

– January 2014 issue of *Infection Control and Hospital Epidemiology* ⁴

“We’re making judgments on normal and abnormal temperatures based on information that may be inaccurate. Ear and [infrared] skin thermometers are notoriously unreliable.”

– Jonathan Hausmann, MD, Boston Children’s Hospital, quoted in an April 2016 article in *The Wall Street Journal* ⁵

Notes and Excerpts from Studies

1 John, Amrita MBBS, Alhimidi, Heba MD, Cadnum, Jennifer BS, Jencson, Annette BS, CIC, Gestrich, Scott MD, Donskey, Curtis MD, Evaluation of the potential for electronic thermometers to contribute to spread of healthcare-associated pathogens, *American Journal of Infection Control*, June 2017.

Objective: To determine whether shared medical equipment can serve as a vector for the transmission of healthcare-associated pathogens.

Methods: DNA markers were inoculated on the handles of the thermometers and cultured afterwards.

Results: 8% of the handles of the electronic thermometers were contaminated with one or more pathogens (including MRSA) that subsequently spread through the hospital onto surfaces in patients' rooms.

2 Eyre, David W., PhD, et al., A *Candida auris* Outbreak and Its Control in an Intensive Care Setting, *New England Journal of Medicine*, October 2018.

Objective: To determine the cause of a hospital outbreak of *C. auris*, an emerging and multidrug-resistant pathogen.

Methods: An intensive patient and environmental screening program was instituted. Isolates from patients and from the environment were analyzed by whole genome sequencing.

Results: The transmission of *C. auris* in this hospital outbreak was found to be linked to reusable axillary temperature probes, indicating that the pathogen can persist in the environment and be transmitted in health care settings.

3 McDonald, L. Clifford MD, Centers for Disease Control and Prevention, Atlanta, Georgia, et al., *Clinical Practice Guidelines for Clostridium difficile Infection in Adults and Children: 2017 Update* by IDSA and SHEA, The University of Chicago Press on behalf of The Society for Healthcare Epidemiology of America, January 2018.

Objective: To update previous guidelines on how to most effectively treat patients with *C. diff*, applying the latest data and information.

Methods: Data was collected for surveillance purposes and tabulated and reported.

Results: Recommendations "...including replacement of electronic rectal thermometers with disposables, can reduce the incidence of CDI."

4 Landelle, C. PharmD, PhD, et al., Contamination of Healthcare Workers Hands with *Clostridium difficile* Spores after Caring for Patients with *C. difficile* Infection, The University of Chicago Press on behalf of The Society for Healthcare Epidemiology of America, January 2014.

Objective: To quantify the percentage of health care workers who still carried spores of bacteria on their hands even after disinfecting them with alcohol.

Methods: In a controlled study, health care workers followed four infection control measures when coming into contact with patients with *C. diff*.

Results: 24% of healthcare workers had the spores on their hands even after disinfecting them with alcohol.

5 Reddy, Sumathi, "At What Temperature Do You Really Have a Fever?", *The Wall Street Journal*, April 2016.

Objective: Doctors at Boston's Children's Hospital were attempting to determine true "normal" temperature as well as determine patterns of fever.

Methods: Researchers used a crowdsourcing app to aggregate large amounts of data.

Results: Doctors discussed less accurate types of thermometers and the importance of accuracy, particularly in pediatric patients.

