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CLINICAL ISSUES



THIS MONTH

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PODCAST

Cell phone cleaning
Key words: *electronic device, disinfect, hand hygiene, bacteria, cell phone*.

Laundry facility accreditation
Key words: *linen, laundering, inspection, accreditation standards, Healthcare Laundry Accreditation Council (HLAC)*.

Cleaning hybrid OR floor tracks
Key words: *hybrid OR, between-patient cleaning, terminal cleaning, maintenance, tracking system*.

Nail coverings in the perioperative setting
Key words: *nail lacquer, enhanced nail lacquer, artificial nails, natural nails, hand hygiene*.

CELL PHONE CLEANING

Question:

Should we clean and disinfect our personal cell phones before bringing them into the OR?

Answer:

Yes, the AORN "Guideline for surgical attire"[1] recommends that, before bringing cell phones, tablets, and other personal communication devices into the OR, the individual owner clean and disinfect the item according to the manufacturer's instructions for use (IFU). The owner should also perform hand hygiene frequently when handling the device. Health care personnel touch their cell phones multiple times throughout the workday. Each contact leads to the shedding of skin cells, thereby providing a constant nutrition source (ie, amino acids, minerals) for microorganisms.[2] The combination of heat generated by cell phones and any crevices that may be present in cracked screens or cases creates an effective medium for microorganism growth.[3] In three separate studies conducted in orthopedic ORs, researchers cultured a total of 177 health care workers' cell phones and found a variety of bacteria,

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including possible clinical pathogens, on both the front and back of the phones.[4-6] The bacteria recovered included coagulase-negative *Staphylococcus*, *Acinetobacter* species, *Bacillus* species, *Enterobacter* species, *Pseudomonas* species, and *Streptococcus* species;[4-6] *Staphylococcus aureus*;[4,6] and *Enterococcus* species and *Viridans streptococci*.[6] In one study, both methicillin-sensitive *S aureus* and methicillin-resistant *S aureus* were also isolated.[4]

Performing hand hygiene after touching communication or other electronic devices can decrease the number of bacteria present on health care personnel's hands, thereby limiting transmission of potential pathogens. In an observational cohort study in an orthopedic OR to investigate the association between an individual's cell phone contamination and their bacterial colonization, the cell phones, anterior nares, and dominant hands of 47 orthopedic surgeons and 25 perioperative nurses were cultured 30 minutes after surgery completion.[4] Of the 72 participants, 70 (97%) had positive bacterial cultures on their phone. Of those 70, 66 had the same bacteria in their nares or on their hands—4.5% on their hands, 16.7% in their nares, and 78.8% in both places. The researchers purported that hands can carry bacteria from the nares to a cell phone and suggested that personal cell phone use in the OR be limited.[4]

Microorganisms on cell phones can multiply and survive for prolonged periods of time. In a nonexperimental study to analyze the viability of pathogenic bacteria on cell phones, researchers inoculated previously owned, sterilized phones with 10 pathogenic bacteria commonly found on cell phones.[7] After the inoculum dried, the bacterial count in colony-forming units (CFUs) was measured at timed intervals for 28 days. The percentage of viability (ie, survival) was calculated as follows: "*No. of CFUs at a time retrieval point / No. of CFUs once the inoculum had dried (100%) x 100.*"[7(p788)] At six hours, all bacteria were still detectable; however, the rate at which bacteria became nonviable was variable. At 28 days, gram-positive bacteria remained significantly more viable than gram-negative bacteria. This extended period of viability can enable pathogens to persist on cell phones, thereby providing a route of transmission to vulnerable patients. The researchers recommended that users also perform hand hygiene when disinfecting phones.[7]

In a study comparing bacterial colonization of cell phones among health care personnel at the beginning and end of their shift in the intensive care unit, 100% of the phones were found to be contaminated with at least one type of bacteria at the beginning of the shift.[8] The contamination rate, as well as the type of microorganism, did not significantly change from the beginning to the end of the work shift. When the bacterial species obtained from health care workers' phones were compared to the oral, pharyngeal, and anal cultures of patients admitted to the intensive care unit during the study time frame, none of the same bacteria were noted, suggesting that bacteria on the phones were already present at the start of the shift and that contamination occurred progressively during the workday.[8]

Studies have shown that, along with performing hand hygiene, regular cleaning and disinfecting of cell phones decreases the number of microorganisms present on the devices, potentially preventing health care–associated infections by decreasing the number of microorganisms transferred to patients via health care workers' hands.[9,10] A systematic review of 12 interventional studies investigating the effect of health care personnel's cell phone cleaning practices on bacterial contamination levels found that cleaning and disinfection produced significant reductions in contamination, with six of the studies achieving a reduction of 80% or more.[9] A modified scoping review of the cell phone cleaning practices among perioperative personnel found there was a significant decrease in cell phone bacterial load with all cleaning methods, particularly when combined with hand hygiene.[10]



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REFERENCES

1. Guideline for surgical attire. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc; 2024:1025-1040.

18780369, 2024, 4, Downloaded from https://aornjournal.onlinelibrary.wiley.com/doi/10.1002/aorn.14115 by John Rosing , Wiley Online Library on [02/04/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

2. Leyden JJ, McGinley KJ, Nordstrom KM, Webster GF. Skin microflora. *J Invest Dermatol.* 1987;88(3 suppl):65s-72s. Accessed January 18, 2024. https://www.jidonline.org/article/S0022-202X(15)59433-5/pdf
3. Simmonds R, Lee D, Hayhurst E. Mobile phones as fomites for potential pathogens in hospitals: microbiome analysis reveals hidden contaminants. *J Hosp Infect.* 2020;104(2):207-213. https://doi.org/10.1016/j.jhin.2019.09.010
4. Chang CH, Chen SY, Lu JH, Chang CJ, Chang Y, Hsieh PH. Nasal colonization and bacterial contamination of mobile phones carried by medical staff in the operating room. *PLoS One.* 2017;12(5):e0175811. https://doi.org/10.1371/journal.pone.0175811
5. Murgier J, Coste JF, Cavaignac E, et al. Microbial flora on cell-phones in an orthopedic surgery room before and after decontamination. *Orthop Traumatol Surg Res.* 2016;102(8):1093-1096. https://doi.org/10.1016/j.otsr.2016.09.014
6. Shakir IA, Patel NH, Chamberland RR, Kaar SG. Investigation of cell phones as a potential source of bacterial contamination in the operating room. *J Bone Joint Surg Am.* 2015;97(3):225-231.
7. Simmonds-Cavanagh R. Viability of hospital pathogens on mobile phone. *Am J Infect Control.* 2022;50(7):787-791. https://doi.org/10.1016/j.ajic.2021.11.003
8. Galazzi A, Panigada M, Broggi E, et al. Microbiological colonization of healthcare workers' mobile phones in a tertiary-level Italian intensive care unit. *Intensive Crit Care Nurs.* 2019;52:17-21. https://doi.org/10.1016/j.iccn.2019.01.005
9. De Groote P, Blot K, Conoscenti E, Labeau S, Blot S. Mobile phones as a vector for healthcare-associated infection: a systematic review. *Intensive Crit Care Nurs.* 2022;72:103266. https://doi.org/10.1016/j.iccn.2022.103266
10. Dowden A, Manson-Brick N, Martin W, McKerricher L, Wiebe M. Recommended cleaning practices for cell phones in the operating room: a modified scoping review. *ORNAC J.* 2020;38(2):15-27. Accessed January 19, 2024. https://link.gale.com/apps/doc/A627278092/HRCA?u=tel_oweb&sid=googleScholar&xid=a21b07ea

LAUNDRY FACILITY ACCREDITATION

Question:

I noticed that one of the AORN recommendations for laundering scrub apparel is that it be completed in a health care–accredited laundry facility. What are the requirements for a laundry facility to be health care–accredited, and how do these facilities differ from other laundry facilities?

Answer:

A health care–accredited laundry facility is an establishment that processes health care linens and "has successfully passed an inspection of its facility, policies and procedures, training programs, and relationships with customers."[1(p1035)] A mandate that requires the accreditation of health care laundry facilities does not exist, making accreditation voluntary.[2] However, a laundry facility that meets and maintains accreditation protects the health and safety of patients and health care workers through its commitment to excellence in processing health care linen. An accredited laundering facility provides consistent, smooth, and reliable linen management services that meet or exceed the standards set forth by the accrediting body.[3]

The Healthcare Laundry Accreditation Council (HLAC) is an independent, nonprofit organization that develops standards and inspects and accredits laundries that process reusable textiles for hospitals, nursing homes, and other health care facilities.[4] The standards for health care laundry accreditation are the minimum acceptable practice for preparation of clean, reusable health care linens for patient care and are based on federal regulations and guidelines, such as Occupational Safety and Health Administration–required practices and industry standards.[5] The standards' main areas of focus are the laundry facility's physical layout and ventilation, laundry equipment, handling of soiled linen, linen processing and transportation, maintenance of a clean and aseptic environment, staff member education and competence, quality assessment, and customer service. To date, approximately 180 laundry facilities have been accredited by the HLAC.[6,7]

When pursuing accreditation, representatives from the facility (eg, members from environmental services, laundry processing, infection prevention, and facility engineering) should review the current HLAC accreditation standards[8] and the associated checklist[9] and process guide[10] to determine their facility's readiness. When

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Resources

Infection Control Assessment and Response (ICAR) Tool for General Infection Prevention and Control (IPC) Across Settings. Module 9. Healthcare Laundry Facilitator Guide. Accessed January 29, 2024. *https://www.cdc.gov/infectioncontrol/pdf/icar/IPC-mod9-healthcare-laundry-508.pdf*

Laundries. Healthcare Laundry Accreditation Council. Accessed January 16, 2024. *https://hlacnet.org/laundries/*

ready to proceed, the facility should submit the accreditation inspection agreement and fees to the HLAC;[2] the HLAC board of directors will then assign an inspector to conduct an onsite visit and evaluate compliance with the standards.[11] The inspectors are independent contractors with a wide range of experience in environmental services, laundry production and operations, laundry facility planning and design, linen management, nursing, occupational safety, and infection prevention and control, and are each provided with in-depth education on the HLAC standards and inspection guidelines before beginning their surveillance.[5] It is important to note, however, that an HLAC inspector is not a state or federal surveyor, and therefore compliance with the HLAC standards should not be misconstrued as compliance with state or federal regulations.[2] Upon receipt of the inspector's report, the accreditation committee reviews the results and determines if accreditation will be awarded or if remediation is needed. If no remediation is necessary, the facility will receive a certificate for a three-year accreditation, though unannounced inspections may still occur during this period. If remediation is needed, corrections are to be implemented within 15 business days upon receipt of the list of failed standards.[8]

If a health care organization does not have a health care–accredited laundry facility onsite or cannot outsource their laundry to an offsite, accredited facility, AORN recommends that the facility follow their state's regulatory requirements for laundering; in the absence of state requirements, they should follow the Centers for Disease Control and Prevention's recommendations for laundering.[1,12] If there is uncertainty regarding whether a facility's linen management processes are compliant with these guidelines, perioperative leaders, infection control personnel, and other representatives as needed could directly observe their facility's processes.

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REFERENCES

1. Guideline for surgical attire. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc; 2024:1025-1040.
2. FAQs. Healthcare Laundry Accreditation Council. Accessed January 19, 2024. https://hlacnet.org/faqs/
3. Why accredit. Healthcare Laundry Accreditation Council. Accessed January 12, 2024. https://hlacnet.org/why-accredit/
4. Healthcare Laundry Accreditation Council. Accessed January 19, 2024. https://hlacnet.org/
5. HLAC marking 15th year of inspecting, accrediting healthcare laundries. American Laundry News. February 15, 2021. Accessed January 12, 2024. https://americanlaundrynews.com/articles/hlac-marking-15th-year-inspecting-accrediting-healthcare-laundries
6. Standards. Healthcare Laundry Accreditation Council. Accessed December 12, 2023. https://hlacnet.org/standards/
7. Goetz J. Strategies to optimize the laundry process. American Laundry News. May 26, 2020. Accessed January 19, 2024. https://americanlaundrynews.com/articles/strategies-optimize-laundry-process
8. *HLAC Accreditation Standards*. Rapid City, SD: Healthcare Laundry Accreditation Council; 2023. Accessed January 19, 2024. https://hlacnet.org/wp-content/uploads/2023/09/HLAC_AccreditationStandards_09-21-2023.pdf
9. *HLAC Accreditation Standards 2023 Edition Checklist*. Accessed January 19, 2024. https://hlacnet.org/wp-content/uploads/2023/05/HLAC_2023-Accredidation-Standards-Checklist2.pdf
10. *HLAC Accreditation Standards 2023 Inspection Process Guide*. Accessed January 19, 2024. https://hlacnet.org/wp-content/uploads/2023/04/HLAC_Accreditation-Inspection-Guide4.pdf
11. Accreditation. Healthcare Laundry Accreditation Council. Accessed January 12, 2024. https://hlacnet.org/accreditation/
12. Sehulster L, Chinn RYW; Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for

18780369, 2024, 4, Downloaded from https://aornjournal.onlinelibrary.wiley.com/doi/10.1002/aorn.14115 by John Rosing , Wiley Online Library on [02/04/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR Recomm Rep*. 2003;52(RR-10):1-42. Accessed January 19, 2024. https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm

CLEANING HYBRID OR FLOOR TRACKS

Question:

We recently opened a hybrid OR with tracks for manipulating imaging equipment on the floor as opposed to the ceiling. Should the tracking be cleaned in the same manner (eg, same frequency and disinfectant) as the OR floors?

Answer:

When present on the floor or ceiling, tracking can accumulate dust and debris, which potentially can be aerosolized and transferred to the surgical wound or sterile supplies. Therefore, a process should be established for regular cleaning and disinfection, as well as maintenance of the tracking system. Regular care is of particular importance when the tracking is on the floor in a hybrid room because of the additional personnel and equipment that may be present during a procedure.[1,2]

Both between-patient and terminal cleaning should occur each day that the hybrid OR is in use. Between-patient cleaning is performed at the end of each procedure when the patient leaves the room. All items used during patient care, as well as any soiled items, should be disinfected. If soiled or potentially soiled, floors and walls should be cleaned. Terminal cleaning is performed at the end of the day for all procedure rooms used that day. All surfaces of items in the rooms, including wheels and casters, should be cleaned. The entire floor, including the tracking, should be mopped or wet-vacuumed,[3] although there are a few caveats. One, the Environmental Protection Agency–registered, hospital-grade disinfectant used by the facility may not be compatible with the tracking system; and two, it may not be safe to immerse the tracking system during wet-vacuuming.[4] Therefore, the tracking system manufacturer's IFU should be reviewed; if the cleaning process is unclear, the manufacturer should be contacted directly for clarification. If a different cleaning process is necessary for the tracking system, the personnel responsible for cleaning should be educated on the process and provided with the necessary cleaning equipment.

It is also important to maintain the integrity of the tracking system because uneven surfaces and cracks can create crevices that can accumulate debris and dust.[5] The manufacturer's required maintenance should be completed and documented. Regular inspection of the tracking for cracks, crevices, or breakage, along with a process for reporting and repairing defects, should be established.

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REFERENCES

1. Guideline for minimally invasive surgery. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc; 2024:531-564.
2. Hemingway M, Kilfoyle M. Safety planning for intraoperative magnetic resonance imaging. *AORN J*. 2013;98(5):508-524. https://doi.org/10.1016/j.aorn.2013.09.002
3. Guideline for environmental cleaning. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc; 2024:197-226.
4. Sehulster L, Chinn RYW; Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR Recomm Rep*. 2003;52(RR-10):1-42. Accessed January 19, 2024. https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm
5. Guideline for design and maintenance of the surgical suite. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc; 2024:79-142.

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NAIL COVERINGS IN THE PERIOPERATIVE SETTING

Question:

I'm a surgical director opening a new ambulatory surgery center, and we need to establish our hand hygiene policy. What are AORN's recommendations about nail coverings in the perioperative setting?

Answer:

According to the AORN "Guideline for hand hygiene,"[1] health care workers should have healthy, short, natural fingernails; artificial nails and nail extenders should not be worn by anyone in the perioperative setting. Perioperative team members who function in the scrub person role should not wear nail lacquer or enhanced nail lacquer while scrubbed.[1-3] The facility should determine whether nonscrubbed personnel can wear nail lacquer or enhanced nail lacquer in the perioperative setting. If allowed, the facility policy should specify that the nail lacquer and enhanced nail lacquer remain free of chips and cracks.[1]

To establish a hand hygiene policy for the perioperative setting, an interdisciplinary team that includes infection preventionists, perioperative RNs, surgical technologists, surgeons, anesthesia professionals, risk management personnel, and other relevant stakeholders may be convened. This policy should include a definition of the types of nail coverings (eg, artificial nails, nail extenders, nail lacquer, enhanced nail lacquer) and state that artificial nails and nail extenders are not permitted in the perioperative setting.[1] It should also state that nail lacquer and enhanced nail lacquer should not be worn by personnel working in the scrub person role.[1] The policy also should reflect the facility leaders' decision about whether nail lacquer or enhanced nail lacquer will be permitted for nonscrubbed personnel. If the interdisciplinary team decides to allow nail lacquer or enhanced nail lacquer for nonscrubbed personnel, the facility policy should include

- a definition for *fresh nail lacquer* (eg, one-day old, free of chips),
- a plan for monitoring adherence to the policy, and
- the expectation that personnel will remove nail lacquer or enhanced nail lacquer if they are assigned to the scrub role.

To distinguish between the different types of nail coatings, *nail lacquer* is the term for nail coverings (eg, nail polish, nail varnish) that are applied in layers and can be removed easily with nonacetone remover (ie, nail polish remover). *Enhanced nail lacquer* (eg, Shellac, dip powder, gel polish, nail wraps) offers improved adhesion to the nail and longer duration of wear; in some instances, it requires ultraviolet light to harden.[1] To remove enhanced nail lacquer, the wearer must soak the nails in acetone for a specified amount of time to soften the lacquer and remove it safely from the nail.[4]

An emphasis on short, healthy, natural nails should be communicated to all personnel working in the perioperative environment. A case report of 16 patients who underwent a median sternotomy in one facility described an outbreak of *Pseudomonas aeruginosa* that was found to be directly associated with a nail infection on a scrub person involved in those procedures.[5] Because *P aeruginosa* is not a common causative pathogen for sternal surgical site infections (SSIs), facility leaders initiated an investigation into the source. The team traced the source to a scrub person with a subungual infection on their thumbnail colonized with *Candida albicans* and *P aeruginosa*. Cultures revealed the strain of *P aeruginosa* found under the scrub person's nail matched the strain that caused the SSIs. They also discovered that this individual routinely wore flesh-colored nail lacquer that concealed the nail infection. Despite performing surgical hand antisepsis and putting on sterile gloves, the infection contributed to the outbreak. After this scrub person was identified as the likely source of the infections, they were removed from the scrub role, and the facility noted no additional SSIs from *P aeruginosa*. The individual's nail bed remained colonized even after use of an antifungal medication, and only after surgical removal of the infected nail were the cultures from the nail bed negative. The authors suspected that the nail infection and abnormal lifting of the nail may have limited the effectiveness of the surgical hand scrub product.[5]

Two other studies investigated the association between the wearing of nail lacquer or enhanced nail lacquer and bacterial counts on health care workers' nails.[6,7] The first study compared bacterial growth on freshly painted nails and natural nails in the health care setting.[6] The freshly

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painted nails showed less bacterial growth than natural nails, but only when unchipped and within 24 hours of application. If the nail lacquer was chipped, the bacterial count on the study participants' hands was higher, even with the performance of hand hygiene.[6] In the second study, researchers monitored bacterial growth on the nails of 88 health care workers at three separate study locations.[7] The dominant hand of every study participant had nail lacquer applied to one nail and enhanced nail lacquer applied to one nail, and the remaining three nails were left natural. The study participants' nails were swabbed at 1, 7, and 14 days after application of the lacquers both before and after performing hand hygiene with an alcohol-based gel. The results indicated that use of an alcohol-based hand gel may be more effective at decreasing the bacterial burden when applied to natural nails and lacquered nails compared to nails with enhanced lacquer, although the bacterial burden after hand hygiene was not significantly different among the three tested conditions. The researchers suggested that the enhanced nail lacquer lasts longer and allows for more nail outgrowth. Deep crevices can develop as the nails grow out, allowing for bacterial growth in these crevices.[7]

Editor's note: *Shellac is a registered trademark of Creative Nail Design, Inc, San Diego, CA.*



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REFERENCES

1. Guideline for hand hygiene. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc; 2024:277-314.
2. Glowicz JB, Landon E, Sickbert-Bennett EE, et al. SHEA/IDSA/APIC practice recommendations: strategies to prevent healthcare-associated infections through hand hygiene: 2022 update. *Infect Control Hosp Epidemiol.* 2023;44(3):355-376. https://doi.org/10.1017/ice.2022.304
3. Surgical site infections: prevention and treatment. National Institute for Health and Care Excellence. April 11, 2019. Updated August 19, 2020. Accessed January 19, 2024. https://www.nice.org.uk/guidance/ng125
4. *UV Gel Manicures Proper Removal for Continued Nail Health*. Professional Beauty Association, Nail Manufacturers Council on Safety. Accessed January 12, 2024. https://beautyimages.bobitstudios.com/upload/_migratednails/files/Handouts/RemovingUVGels.pdf
5. McNeil SA, Nordstrom-Lerner L, Malani PN, Zervos M, Kauffman CA. Outbreak of sternal surgical site infections due to *Pseudomonas aeruginosa* traced to a scrub nurse with onychomycosis. *Clin Infect Dis.* 2001;33(3):317-323. https://doi.org/10.1086/321890
6. Blackburn L, Acree K, Bartley J, DiGiannantoni E, Renner E, Sinnott LT. Microbial growth on the nails of direct patient care nurses wearing nail polish. *Oncol Nurs Forum.* 2020;47(2):155-164. https://doi.org/10.1188/20.onf.155-164
7. Hewlett AL, Hohenberger H, Murphy CN, et al. Evaluation of the bacterial burden of gel nails, standard nail polish, and natural nails on the hands of health care workers. *Am J Infect Control.* 2018;46(12):1356-1359. https://doi.org/10.1016/j.ajic.2018.05.022

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