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Course Information

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- The applicability and accuracy of the course content may vary by the clinical, geographical, and cultural context; you should evaluate the course accordingly.
- As healthcare is rapidly evolving, new findings may change the validity of the information presented in this course. Providers should always consult the latest research and guidelines from professional associations.
- The interventions discussed in this course may be limited in generalizability, requiring practitioners to consider specific individual and population factors.
- The course may not cover all possible risk factors, diagnostic methods, or treatment options, and complex cases may require additional considerations.
- Healthcare providers should apply cultural competence and sensitivity to ensure effective and respectful care based on their patients' diverse needs.
- Providers should always evaluate the limitations of diagnostic and screening tools, considering their potential for false results as well as any ethical implications.
- It is the responsibility of course participants to critically evaluate the evidence from multiple sources to guide professional practice.

Infection Control: Readiness and Response for Hearing Healthcare

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Learning Objectives

Participants will be able to:

- Identify potential modes of infection
- List hearing healthcare professionals who should practice infection control
- Identify appropriate handwashing procedures

Speaker Disclosures

Michele Hurley, Au.D.

Michele Hurley is a Senior Education & Training Audiologist at Starkey. Financial relationships and conflicts of interest: This course is presented in partnership with Starkey. Presenters are employees or paid consultants of the company. Off-label use: Nothing in this course involves off-label use.

What Is Infection Control?

Infection control is defined as the "conscious management of the clinical environment for purposes of minimizing or eliminating the potential spread of disease" (Bankaitis & Kemp, 2003, 2004). It is a global concern and a foundational responsibility for every hearing healthcare professional.

The hearing healthcare environment introduces unique infection risks due to the close proximity of clinicians to patients, the regular handling of instruments that enter the ear canal, and the nature of the patient population served — which often includes older adults with multiple comorbidities.

Why Hearing Professionals Should Practice Infection Control

Hearing loss is associated with a wide range of comorbid conditions that increase patient vulnerability. Many of the patients we serve have compromised immune systems, making infection prevention especially critical.

Comorbidities of Hearing Loss



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Figure: Icon diagram showing ten comorbidities associated with hearing loss: Tinnitus, H

Infection Control and the Elderly

Elderly patients face heightened infection risk due to three key contributing factors: anatomic changes that reduce natural defenses, functional changes that impair immune response, and a greater degree of exposure to infection through increased contact with healthcare settings.

Global Diseases and Infectious Threats

Infectious diseases travel without borders. The COVID-19 pandemic underscored the speed at which pathogens can spread globally. Hearing healthcare professionals must remain vigilant about a range of threats including HIV, H1N1, Measles, Coronavirus, Influenza, and COVID-19.

Disease	Key Facts for Hearing Healthcare
Measles	Declared eliminated in the US in 2000; cases resurging. Spreads via contact, air droplets, or contaminated surfaces. Can survive up to 2 hours in an airspace. Complications include sensorineural hearing loss, pneumonia, encephalitis, and death.
Influenza	Approximately 1 billion cases per year globally; 300,000-650,000 deaths annually. Different strains each year. Symptoms: upper respiratory infection, fatigue, fever, chills, muscle pain, headache.
COVID-19	Declared a pandemic by the WHO on March 11, 2020. Significant impact on hearing healthcare delivery, accelerating telehealth and increasing PPE requirements in clinical settings.
Superbugs (AMR)	Antibiotic-resistant organisms including MRSA, Pseudomonas aeruginosa, CRE, and VRE present serious risks in outpatient healthcare settings. Standard disinfection protocols remain essential to limit spread.

Q1

Quiz Hint

- Infection control protocols must be understood and practiced by ALL office staff — not just clinical staff.
- This includes clinical audiologists, dispensing audiologists, hearing instrument specialists, manufacturer technicians, and administrative staff.
- OSHA categories 1 and 2 employees are required to practice infection control procedures.

Modes of Transmission

Understanding how pathogens are transmitted is the first step in preventing infection. There are four primary modes of transmission relevant to hearing healthcare practice.

Modes of Transmission



Figure: Four-panel diagram illustrating the modes of disease transmission: Contact (clin

Mode	Definition
Contact Transmission	Direct: transmission without intervening persons, barriers, or conditions (e.g., handshake, handling a hearing aid). Indirect: infectious microbes transferred from a secondary surface (e.g., contaminated instrument).
Vehicle Transmission	Through contaminated food, water, or bodily substances such as cerumen. Droplet transmission is also included here — particles expelled via coughing and sneezing that land on a surface.
Airborne Transmission	Through the air via droplets or particles that remain suspended. Measles, for example, can survive up to 2 hours in an airspace.
Vectorborne Transmission	Insects or animals transfer pathogenic agents (e.g., mosquitoes transmitting malaria). Less common in the clinic setting but part of the full epidemiological picture.

Routes of Entry

In the clinical context, the primary routes through which pathogens enter the body are the mouth, nose, eyes, and ears. The external auditory canal is of particular significance, as it is more prone to infection than any other skin surface (Jahn & Hawke, 1992).

Cerumen as a Vehicle

Cerumen Must Be Treated as an Infectious Substance

A hearing professional cannot determine the content of cerumen by visual inspection alone. Always treat cerumen as potentially infectious. Contamination with blood or mucus elevates the risk further.

Q2

Quiz Hint

- The most frequent mode of cross-contamination and disease transmission is Contact Transmission.
- This includes both direct contact (person to person) and indirect contact (via contaminated instruments or surfaces).
- In the hearing clinic, indirect contact is especially common — through hearing aids, earmolds, otoscope specula, and headphones.

The Impact of Hearing Products on Infection Risk

Hearing aids and earmolds sit in or near the ear canal and are handled by both patients and clinicians. Research has confirmed that a range of opportunistic and pathogenic microorganisms are recoverable from hearing aids in clinical use (Bankaitis, 2002).

Infectious Microbes Found on Hearing Aids

Recovered Microbe	Associated Infections or Diseases
Aspergillus flavus	Infection of tissues, mucosal surfaces, and otitis
Candida parapsilosis	chronic mucocutaneous candidiasis
Coagulase-negative staphylococcus	furuncles, boils, bacteremia, endocarditis, pneumonia, osteomyelitis
Enterococcus, lactobacillis	urinary tract infections
Pseudomonas aeruginosa	chronic otitis media, otitis externa, malignant otitis externa

Figure: Reference table listing infectious microbes recovered from hearing aids and their associated infections or diseases.

The presence of these organisms underscores the importance of disinfecting hearing instruments before and after every patient encounter. Cerumen, blood, and ear drainage should be treated as infectious bodily substances.

Opportunistic Infections

Ubiquitous organisms — those found commonly in the environment — can cause disease in immunocompromised individuals. Given that many hearing healthcare patients are elderly or have comorbid conditions, opportunistic infection is a real and serious concern.

Disease Prevention: Universal Precautions

The Centers for Disease Control (CDC) Universal Precautions framework provides the foundation for infection control in all healthcare settings. These precautions are designed to protect both patients and clinicians by treating all blood and bodily substances as potentially infectious.

CDC Universal Precaution	Clinical Application in Hearing Healthcare
Personal Protective Equipment (PPE)	Glasses/goggles, masks, and gowns when risk of exposure to bodily substances. Gloves are required in specific situations.
Hand Hygiene	Before and after every patient interaction, after glove removal, and when cleaning instruments.
Clean/Disinfect Surfaces	All clinical surfaces, instruments, and hearing devices between patients using appropriate products.
Sterilize Critical Instruments	Metal cures, suction tubes, and specula require sterilization. Disposable instruments are single-use only.
Appropriate Waste Disposal	Infectious materials (blood, drainage) must be disposed of in separate packaging to protect cleaning staff.

Personal Protective Equipment (PPE)

PPE for hearing healthcare includes glasses or goggles, masks, and gowns. Gloves should be worn in the following situations:

- Open wounds or visible blood are present
- Cleaning or disinfecting instruments contaminated with bodily substances
- Submersion or removal of instruments into or from cold sterilant
- Contamination with potentially infectious materials (including cerumen) is likely

Gloves must fit properly. An improperly fitted glove compromises barrier protection. Always wash hands after removing gloves — gloves do not replace hand hygiene.

Hand Hygiene

Handwashing is among the simplest, least expensive, and most effective infection control measures available. It protects patients, clinicians, and the broader community.

5-Step CDC Handwashing Procedure

- Wet your hands with clean, running water, turn off the tap, and apply soap
- Lather your hands by rubbing them together with the soap
- Scrub your hands for at least 20 seconds
- Rinse your hands well under clean, running water
- Dry your hands using a clean towel or an air dryer

When soap and water are not available, alcohol-based hand sanitizer (no-rinse) may be used. Apply the appropriate amount to the palm, rub hands together including between fingers, and allow to air dry completely — do not use a towel to dry hands with a no-rinse product.

Hand hygiene must occur: before and after each patient appointment, after glove removal, and when cleaning instruments.

Q3**Quiz Hint**

- Hand washing must occur: before and after each patient interaction, when cleaning instruments, AND after glove removal.
- All three scenarios require hand hygiene — the correct answer is 'All of the above.'
- Soap and water is generally preferred; alcohol-based sanitizer is acceptable when hands are not visibly soiled.

Cleaning, Disinfecting, and Sterilizing

Three distinct levels of decontamination are used in hearing healthcare. Understanding the difference is essential for selecting the appropriate method for each instrument and surface.

Cleaning and Disinfecting



Figure: Three-panel comparison diagram defining Cleaning (removal of gross contamination

Level	Definition & Application
Cleaning	Removal of gross contamination from instruments and areas without necessarily killing germs. Always the first step before disinfection or sterilization.
Disinfection	Kills a percentage of germs. Requires an EPA-approved, hospital-grade disinfectant. Used for non-critical items: headphones, earmolds, surfaces not contaminated with blood or drainage. Available as liquid, spray, or towelette.
Sterilization	Kills 100% of germs, including endospores. Required for critical instruments. Methods include autoclave and cold sterilization (glutaraldehyde 2.5% or hydrogen peroxide 7.5%).

Disinfecting Non-Critical Items (Hearing Products)

For hearing aids, earmolds, and accessory surfaces, the recommended procedure is:

- Wipe the hearing aid, earmold, and accessory surfaces with a tissue to remove debris
- Disinfect the item with a non-alcohol-based disinfectant towelette
- Accept or return products to the patient in a receptacle lined with a disposable towel

Note: UVC (Ultraviolet-C) light is most effective when combined with traditional disinfecting methods (Bankaitis & Zitelli, 2020). UVC alone is not sufficient.

Critical Instruments and Sterilization

The following instruments CAN be sterilized: metal curettes, metal suction tubes, and metal specula. The following are single-use and CANNOT be sterilized: plastic otoscope specula (video or handheld), Bionix curettes, insert earphones, and tympanometry tips. These must be discarded after use.

Cold Sterilant	Concentration / Timing / Product
Glutaraldehyde	2.5% concentration; sterilizes in 10 hours; 28-day usage period (e.g., Wavicide, Cavicide)
Hydrogen Peroxide	7.5% concentration; sterilizes in 7 hours; 21-day usage period (e.g., Sporox II)

Disinfecting Office Surfaces

Hard (non-porous) surfaces should be cleaned of contamination with soap and water prior to disinfecting. UV light sanitizers are effective for surfaces such as desktops, door handles, sinks, and phones. Follow manufacturer instructions for all equipment. Soft (porous) surfaces should be laundered following manufacturer instructions in warm water and dried completely.

OSHA Requirements and the Written Infection Control Plan

OSHA requires all healthcare facilities, including hearing healthcare practices, to maintain a written infection control plan. This is not optional — it is a regulatory requirement. The plan must be reviewed and updated annually.

Required Element	Description
Categorization of Employees	Each employee is classified by potential exposure: Category 1 (Clinical Audiologists), Category 2 (Dispensing Audiologists, Hearing Instrument Specialists, Manufacturer Technicians), Category 3 (Administrative Staff). Categories 1 and 2 must practice infection control.
HBV Vaccination	All Category 1 and 2 employees must be offered the Hepatitis B vaccination at no charge. Records maintained for the duration of employment plus 30 years.
Training Plan and Records	Annual infection control training must be conducted and documented for all applicable staff.
Work Practice Controls	Outlines how procedures will be performed to minimize disease spread (e.g., wearing gloves, altering cerumen management technique).
Engineering Controls	Physical or procedural barriers that reduce exposure: designated sterilization room, storage of reusable instruments, hazard labeling.
Emergency Procedures	Documented protocols for accidents and exposure incidents.
Post-Exposure Evaluation	In the event of an exposure: confirm transfer of disease, seek medical assistance, begin treatment if needed, document circumstances, route, treatment, and outcome. Records must be kept.

Infection Control in Dispensing Practice

Specific infection control protocols apply to the following common dispensing procedures: earmold impression procedures, dispensing hearing aids, accepting or receiving aids and molds from patients, hearing aid listening check, electroacoustic analysis, real-ear measurements, and hearing aid modification.

Best Practices for Hearing Aid Handling

- Wash hands before and after hearing aid contact
- Disinfect tools after each use
- Use a storage device to accept hearing aids and transfer them around the office
- Don gloves before handling hearing aids and prior to educating patients on insertion/removal
- Prior to dispensing, clean with disinfectant towelette
- Disinfect horizontal surfaces used during dispensing

Key Takeaways

Core Principles for Every Appointment

- Infection control is the responsibility of ALL office staff, not just clinicians.
- Contact transmission is the most common mode of cross-contamination in hearing healthcare settings.
- Cerumen must always be treated as an infectious substance.
- Handwashing must occur before/after each patient, after glove removal, and when cleaning instruments.
- Disinfection kills a percentage of germs (EPA-approved, hospital-grade); sterilization kills 100% including endospores.

- Disposable instruments (tympanometry tips, insert earphones, plastic specula) are single-use only.
- OSHA requires a written infection control plan. Plan to prevent — and plan to resolve.

Notes

Presenter Contact

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Notes:

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