Increasing demand for improved hygiene challenges audiologists

How the latest in device design is helping tackle the risk of infection during immittance testing while improving efficiency

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There has never been a time when the focus on infection control has been a higher priority in the field of audiology than today. The demand on audiologists has increased due to a rising number of patients, an expanded set of reusable objects vital to their work and a wider than ever scope of practice that involves potential exposure to blood, bodily fluids and bacteria.

"To appreciate how the focus has changed, it is worth reflecting back a couple of decades ago when the need and application for infection control within the audiology clinical setting was essentially unrecognized. It was a topic left completely unaddressed." A. U. Bankaitis, PHD.

It is widely agreed that safeguarding patients and clinicians from disease transmission in hospitals and clinics is critical and challenging. In audiology, cross contamination is the primary threat. Short turnaround times between back-to-back patients throughout the workday, some with compromised immune systems, and multiple shared surfaces make cleanliness a constant concern.

The basic nature of immittance testing leaves clinicians and patients at risk because of the high level of direct and indirect contact. Extra time spent to ensure a probe seals properly or adjusting a cumbersome shoulder strap is not ideal. Contamination may stem from commonly used devices such as headphones, probe tips, electrodes, otoscope specula, ear molds, hearing aids, etc. Research has proven that contamination on common clinical tools poses a real danger. A study assessing the growth of staphylococci bacteria which causes serious infections in immune compromised individuals was found on 26 out of 29 stethoscopes (Breathnach, Jenkins, Pedler 1992).When looking at hearing aids and patient interaction in the audiology environment specifically, the presence of mold and bacteria are commonplace according to another study. Each of the 10 hearing aids swabbed for analysis in the study contained light-to-heavy amounts of at least one bacterium, with Coag Neg staphylococcus recovered from 9 of the 10 hearing aids. "In addition to bacterial growth, 4 of the 10 hearing aids contained light-to-moderate amounts of fungal growth, including Aspergillus flavus (2 hearing aids), Candida parapsilosis (2), and/or the light growth of an unspecified mold." (Bankaitis, A. U. 2002).

New cleanliness standards, best practices and training

Greater awareness has led to changes in education and regulation aimed at reducing the likelihood of infection in the clinical environment. In the last few years, several US states have made two hours of infection control training mandatory for audiologists and hearing instrument specialists to renew their licenses. Many core audiology textbooks have added chapters on infection control while international conferences include related topics on their busy agendas and webinars are widely available.

> *"When I see a patient pass through the door and go into the Unit, I feel like I owe them a clean and relaxing environment. I want to make sure that when they leave, they don't carry an infection back home with them."* **Maria De La Fosse, Ward Service Officer at Sandwell and West Birmingham Hospitals NHS Trust**

The daily grind for audiologists in clinics and hospitals has changed too. With demands and risk factors for exposure to infection and germs increasing, new procedures have been put in place to ensure the environment is safe. New federal regulations such as the infection control and hand hygiene training in the National Health Services hospitals in the United Kingdom have been enacted. Aside from mandated procedures, most clinical settings have their own set of constantly evolving best practices aimed at infection control.

The momentum is positive and so far the financial costs associated with training clinicians and implementing new protocols have not been deemed unreasonable, but the reality is that time is also money. With increasing workloads and new protocols, the potential for disrupting the flow of patients increases. The last thing a clinician wants is to have more cleaning and less satisfied patients.

The day to day of meeting standards

The pressure is on clinicians to ensure standards are met and that decontamination is properly carried out. Legal protocols, such as the one outlined by the Environmental Protection Agency (EPA), requires cleaning, disinfecting and/or sterilizing depending on the surface, equipment and situation. Complex protocols are easy to formulate on paper, but the daily demands often result in not everything getting done as it should.

According to results from two studies looking at the implementation of infection protocols among audiologists, "respondents could accurately choose the correct definition of sterilize about 80% of the time, however, Burco found that only 45% of respondents reportedly sterilized necessary reusable instruments or objects in clinical practice." (Amlani, 1999 and Burco, 2008).

Cleaning as protocol may seem straightforward. It requires using a brush, wipe or ultrasonic machine to remove gross contamination from an object or surface without killing germs. It is the precursor to disinfecting and sterilizing. In audiology though, "the nature of touch screens is that multiple clinicians will be making direct contact with the screen and it is doubtful that appropriate screeners have the necessary germ-killing ingredients to meet infection control needs in the clinical environment" A. U. Bankaitis, PHD.

Disinfecting is more complicated than cleaning in the audiology environment. Disinfect means to kill a specific number of germs and hospital and clinical settings generally use hospital grade disinfectant to meet this need. The challenge for audiologists is to use a disinfectant that won't harm plastic, silicone, rubber or acrylic. Rubbing alcohol, although a disinfectant, is not recommended in audiology because its chemical composition alters the surfaces of commonly used materials and devices. "All devices must be wipeable and all their removable parts must be easily cleaned/disinfected otherwise the NHS will not consider them for purchasing." Stamatia Staikoudi, Senior Audiologist, Audiology Department, NHS Lothian, UK.

Disinfection is acceptable on non-critical items that do not come into contact with blood or other potentially infectious substances or that are not likely to break the skin, such as ear molds, hearing aids worn in the ear or canal, supra-aural headphones, etc. If a device or material is contaminated with a potentially infectious material such as blood or mucus, then sterilization is required.

Sterilization in audiology is a complicated and lengthy process, as well as controversial. Objects that are capable of breaking the skin such as curettes and wax loops must be sterilized prior to reuse regardless of contamination. The preferred sterilization technique is heat under pressure in an autoclave which can melt many of the implements used by audiologists. Therefore, "cold sterilization," a process where instruments are soaked in a glutaraldehyde solution for 10 hours, is recommended. There are strict rules for handling and storing the glutaraldehyde solution involving length of storage, handling and disposal since some consider it a biohazard. If there is visible blood on or in cerumen, then the clinician must put instruments such as curettes, immittance and otoacoustic emissions probe tips and otoscopic specula through the cold sterilization process.

With the adoption of infection control standards, procedures and best practices, there is a growing concern for increased costs, added time to appointments and disruption to the overall patient experience that clinicians want to avoid while making cleanliness a top priority."Fabric is definitely an issue and simple things like teddy bears are no longer allowed as they hold infectious materials. Piece of equipment in contact with the patient like the shoulder strap has to be easily cleaned and preferably with anti-bacterial wipes without damaging any components" Donald MacAskill, AuD, MSc, BSc, Nova Southeastern Univer-

What to consider when choosing an immittance device with hygiene in mind?

- Plastic materials that comply with cleaning and disinfecting procedures are easier to maintain than painted wood or metal surfaces
- Avoid touch screen features that provide a cross contamination touch point
- Fewer buttons on equipment means less potential for contamination
- Sealed buttons reduce tiny, hard to clean gaps and risk of damage from disinfecting liquid
- Look for an easy to place or adjust shoulder strap so that patient contact and discomfort is minimized
- Ensure shoulder strap is made of easy to clean materials with minimum gaps
- Greater automation such as sequences and remote controls reduces potential for contamination
- Single use components such as ear and probe tips, especially when able to switch out at the same time, increase efficiency and ensure equipment is hygienic
- If using products or items marked as disposable or one-time-use, use as directed

MADSEN® Zodiac

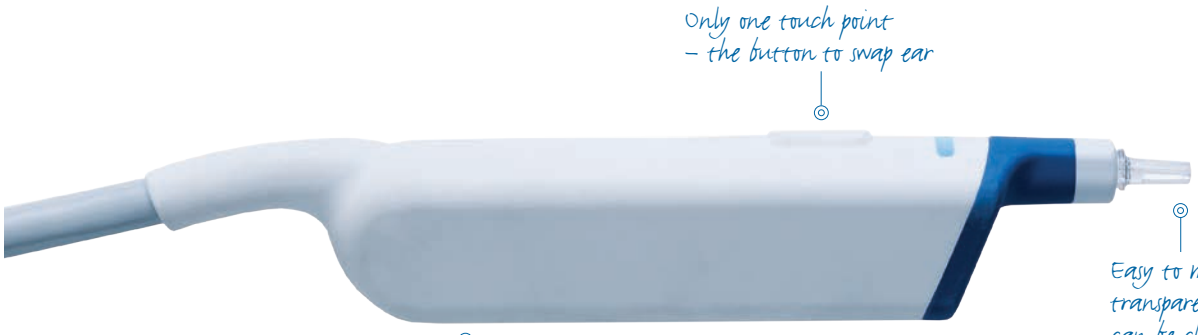
sity, Victoria, British Columbia, Canada. The latest in equipment and device design can go a long way in easing clinician concerns and reducing the challenges associated with greater hygiene and cleanliness in the immittance testing environment.

The MADSEN Zodiac – Designed with hygiene as a priority

Infection control protocols, training and access to information have been making their way into the forefront of audiology and now device design is catching up. The team at Otometrics, an audiology industry leader, decided to prioritize infection control when developing their latest immittance testing equipment, the MADSEN® Zodiac. By observing clinicians on task in a range of working environments such as testing rooms and operating theaters, the experts at Otometrics analyzed current user interaction to better understand what they could improve from a design perspective that would ultimately address the growing need to reduce the high level of surface contact and patient to clinician contact while improving the cleanability of their devices.

The overall goal with the MADSEN Zodiac from a hygiene perspective is to ensure clinicians are able to carry out their work in a safe, healthy environment without added workload or disruption to patients. The outcome is immittance testing equipment that is easy to clean, simple to use with minimal contact to surfaces and between patient and clinician.

MADSEN® Zodiac



The streamlined standalone has sealed buttons and the PC-based version allows clinicians to avoid any contact with the hardware except the probe. The inexpensive probe tips can be changed quickly, and often, because of the EasyLock™ system and due to the probe design, the ear wax filter is no longer part of the probe reducing risk of contamination.

The probes have auto start functionality enabling audiologists to run tymp and reflex screening without touching several buttons. The clinician also has the option to program personalized user tests or sequences reducing contact with the equipment. The new shoulder harness is made from plastic and can be easily cleaned between each patient and the probe assembly can be completely disconnected from the harness if required.

Conclusion

Demands on clinicians for greater hygiene are likely to continue to increase but the latest in equipment design can go a long way in ensuring a safe environment with the least risk of infection for both patient and clinician. The MADSEN Zodiac demonstrates how easy to clean surfaces, fewer touch points and single use components can maximize efficiency and save time while meeting hygiene standards. Along with clear infection-fighting protocols, the MADSEN Zodiac can bring peace of mind to audiologists and clinicians around the globe.

Visit www.otometrics.com/zodiac for more information.

References

Bankaitis, A.U. (2002). What's growing on your patients' hearing aids? A study gives you an idea. The Hearing Journal, 55(6): pp. 48–54.

Bankaitis, A.U. & Kemp, R.J. (2002). Hearing aid related infection control. In: M. Valente (Ed) Strategies for Selecting and Verifying Hearing Aid Fittings, 2nd Edition (pp. 369–383). Thieme Publishing Group, New York, New York.

Kemp, R.J. & Bankaitis, A.E. (2000). Infection Control for Audiologist. In: H. Dunn, R. Roeser, and M. Valente (Eds). Handbook of Audiology: Practice Management (pp. 257–272). Thieme Publishing, New York, New York.

Bankaitis, A.E. (1996). Audiological changes attributable to HIV. Audiology Today, 8(6): pp. 7–9.

Breathnach, A.S., Jenkins, D.R., & Pedler, S.J. (1992). Stethoscopes as possible vectors of infection by staphylococci. British Medical Journal, 305: p. 1573.

Centers for Disease Control and Prevention (2002). Guideline for hand hygiene in healthcare settings. Available: http://www.cdc.gov/handhygiene.

Centers for Disease Control and Prevention (1987). University precautions for prevention and transmission of HIV and other bloodborne infections. Available: http://www.cdc.gov/ncidod/hip/Blood/UNIVERSA.HTM.

FDA (1998). The food and drug administration: an overview. Available: http://www.fda.gov/opacom/hpview.html.

Kemp, R.J. & Bankaitis, A.E. (2000). Infection Control for Audiologists. In: H. Hosford-Dunn, R. Roeser and M. Valente (Ed) Audiology Diagnosis, Treatment, and Practice Management, Vol. III (pp. 257-279). Thieme Publishing Group, New York, New York.

Kemp, R.J., Roeser, R.J., Pearson, D.W., & Ballachandra, B.B. (1996). Infection Control for the Professions of Audiology and Speech Language Pathology. Olathe, KS: Iles Publications.

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Murray, P., Kobayashi, G., Pfaller, M., & Rosenthal, K. (1994). Medical Microbiology (second edition). St. Louis, MO: Mosby-Year Book, Inc.

OSHA (1991) Standard for bloodborne pathogens, Federal Register 29 1910.1030.

Rutala, W.A. (1990). APIC guideline for selection and use of disinfectants. American Journal of Infection Control, 17:52, 99–117.

Schountz, T. & Bankaitis, A.E. (1998). Basic anatomy and physiology of the immune system. Seminars in Hearing, 19(2): p. 131–142.

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