Hearing Loops versus Bluetooth (BT)

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Transmitting Distance: A hearing loop has long-range transmission—example: auditoriums, sports arenas, and airports. Most BT is short range.

Facts re BT: According to Jerry Yanz, Ph.D., Director of Audiology at Hansaton: "There are 3 classes of BT: Class 3 has a range of 1 meter (wireless mouse or keyboard, for example), Class 2 has a 10-m range (cell phones, MP3 players, wireless hearing aid programming), and Class 1 has a 100-m range." Thus BT range is a challenge and resolution of the kinks is "10 years down the road, at best."
Tim Vandermeer, an engineer at Ascom, says "you're lucky to get 20 feet with BT".

Number of Pairings: A hearing loop can accommodate multiple (100 to multiples of 100) users—example: House of Representatives / Westminster Abbey. Case in point: when our practice needs to provide television audibility for multiple users (hearing impaired couple at home or multiple residents in a senior gathering room where movies are watched), a room loop is the only option.

Facts re BT: "But there are other requirements, the most important of which is to have a transmitter that sends a signal to multiple receivers. Originally BT was designed as a secure, point-to-point technology. There are now point-to-multipoint BT applications but there is concern that they are yet amenable to transmitting data-intensive signals like audio". "As yet, I don't think there is one technology that meets all requirements. I do believe that solutions will be developed in the next few years that will change the picture." (Jerry Yanz, Ph.D.)

As Tim Vandermeer, Ascom LLC engineer, has commented "only up to 9 devices can link to a BT transmitter unless one builds some type of very complex layered network."

BT is Complicated The loop sign reminds all to push the T button on the hearing aid. It is a universal symbol reinforcing that full access to the proceedings via the facility's sound system is achieved by switching the hearing aid to the T. The loop sign is an international symbol recognized world-wide.

Facts re BT: The recent (January/February, 2011) article in *Audiology Today (AT)* about connectivity confirms that BT is sometimes rejected due to "technophobia"... "the necessity for pairing may present a significant limitation for many potential older users of this technology" (p28 *AT*).

"BT is complicated both from a design stand-point [see above] and an end-user standpoint: For example, if you were standing in a crowd of people with your cell phone and you pushed the BT button, your phone would search for the BT signal and then list all the devices it found. At this point, you would need to make a choice as to which device you wanted to link to. Imagine a senior trying to do that with their hearing aid!" Todd Billins, President, Ascom LLC

Time Delay: The TC via a loop has no time delay.

Facts re BT: A commonly acknowledged drawback with BT is time delay (a proprietary slide showing different delays per each manufacturer was reviewed). "Although significant progress has been made with respect to BT's audio delay, previous BT systems introduced a delay in the audio transmission, which was quite distracting (up to 50 msec in some cases)" (*AT*, p. 28).
"BT is used to stream audio to the body-worn streamers of NFMI-based wireless hearing aid systems. This introduces a delay that may be unacceptable for television viewing, particularly in the case where direct sound and streamed sound are combined" (*Hearing Review*, p. 28). This is especially the case with our Receiver in the Ear / RITE hearing aid users who use Bluetooth for TV.

Battery Power: Because the loop provides an electromagnetic signal, there is no battery drain when the user is using the Telecoil (TC).

Facts re BT: BT requires considerable battery power and batteries need frequent recharging. According to Jennifer Groth, MA, Director of Audiology Communication at GN ReSound,

"Currently there are nearly 12,000 different products using BT communication. Protocols for BT must therefore be broad enough and flexible enough to accommodate these many uses. Because of this, BT requires much more power to operate than would be practical or acceptable in HA's. (*Hearing Review*, Dec. 2010)

Industry Sparring: Could we get industry to agree on the technology? Currently, all manufacturers provide TC's

Facts re BT:
"As of now, each of the 6 major hearing aid companies has its own proprietary wireless transceiver technology in first generation products which are not compatible to each other. However, in time, I believe that differences in the various wireless technologies used among hearing aid manufacturers will likely be reduced as the relative advantages of one technology over others becomes better known, and the winning wireless technology may become ubiquitous in all hearing aids . . . Although it would make perfect sense for the benefit of your patients to have a single universal wireless technology within the next 10-15 years, history has proven that hearing aid companies have not been able to easily achieve such standardization in technology". . David Preves. Ph.D., senior staff engineer @ Starkey and a member of the ANSI standards committee.

There is incredible variation between linking strategies with each hearing aid manufacturer boasting their proprietary BT technology is the best. While the industry is working it all out, patients will be prevented from hearing in large venues. Some patients may even postpone hearing aid purchase/hearing aid replacement due to conflicting information that is too confusing. Market research has confirmed that too many options may stymie the purchaser.

BT is Expensive and requires the purchase of a BT-accessorized hearing aid with BT-Accessory Products:
TC's are accessible, inexpensive, easy to use and their gain and frequency response mimics the degree and configuration of hearing loss:

- New hearing loop standardization guidelines specify a frequency response of 100-5000 cycles and a dB restricted variance of plus or minus 3 dB. This ensures the transmission of pure clear sound with -0- noise allowed in the area. Of course, the transmission of the signal is dependent upon the speaker at the microphone. Garbage in / garbage out.
- The TC is a low-cost HA option. At our office, the addition of a TC is a no cost option. Often, it is built-in to the hearing aid anyway—typical in a BTE. In cases where it is not, the wholesale price of telecoils is exceedingly reasonable.
- The majority of hearing aids already have a TC or have a TC that just needs to be activated via the manufacturer's software (*Hearing Review*, Feb, 2010) and thus, most hearing aid users can gain access in large venues without purchasing new hearing aids.
- The use of the TC is user-friendly—with a push of a button the TC can be accessed (a significant improvement provided by some manufacturers is the voice prompt so that the audible confirmation of the correct program is ensured)
- The use of the TC is via the same button for the telephone so many patients are already familiar with its location and operation.
- The use of the TC can accommodate an MT setting as well as a T setting. This is a significant advantage with individuals who need to hear a spouse who watches TV from their right, for example, or for those users whose amplified word recognition ability is better in one ear (the direct access for the sound system is reserved for the better hearing ear).

Together, we can transform how people hear with hearing aids in large places**--the easier the handling, the more likely it will be done.** (Juliette Sterkens) "The best system is simply 'the one that is used' " (Doug Beck and David Fabry in Jan/Feb *AT*)

Perhaps you want to emphasize the Human Factor? Why do we have to take what the hearing aid industry is coming out with as the only way? We are being "sold" a bill of goods that we have to deal with in our offices with a clientele that doesn't take to technology as readily as my 17 year old son…some do, no doubt about it, but the majority already have trouble pushing a button… We all have a stake in this… Together we can transform how people hear with hearing aids in large places (Juliette Sterkens).