Hearing Augmentation for Public Buildings, places of worship, meeting rooms etc

With an ever-growing list of options on how to provide access to sound in public spaces like movie theatres, meeting rooms, schools, places of worship etc., it can be confusing trying to keep up. Currently, public buildings with permanently installed sound systems are required to provide a hearing loop, or a receiver system (normally FM or Infra-red systems).

It is always the responsibility of the venue to provide receivers with both neckloop and headset options.

Let's compare these with other technologies that are available.

Hearing Loop

A hearing loop is a continuous wire run either in the roof or under the flooring and is connected to the sound system via the loop amplifier. The wiring functions as an antenna and anyone wearing hearing aids (HA) or cochlear implants (CI) with a Telecoil can wirelessly hear the sound system. This is usually the preferred system for both users and venues, as receivers are not required and is therefore the easiest to maintain.

FM (maybe analogue or digital wireless technology)

FM systems consist of an FM transmitter connected to the sound system and FM receivers with options of neckloops (for HA and CI users) and headphones for other users. There needs to be an appropriate number of receivers available, with both headphone and neckloop options. Staff should be trained to understand the difference between the loop and headphone attachments and the devices need to be kept charged.

To meet the building codes and access requirements an appropriate number of receivers with both neckloops and headphones need to be available.

Roger System

The Roger system is a type of FM system but allows some users who don't have Telecoil on their hearing aids to use the system if they have a Roger receiver. The receiver maybe a Phonak hearing aid (can be activated on Marvel, Paradise or Luminity hearing aids), a Roger neckloop, or an ear level receiver for hearing aids or cochlear implants.

The system consists of a Roger Base Station which is connected to the sound system, and then a WallPilot is placed at the entrances which will automatically connect users' receivers with the correct channel for that room. This can be especially useful in schools where many students may already use a Roger system.

To meet the building codes and access requirements an appropriate number of neck loop receivers and headphones need to be available.

Infra-Red

Infra-red systems are similar to FM systems; however, they use light to transmit the signal from an emitter to the receivers. This signal is based on the line of sight between the emitter and the receiver. It is essential that staff, are trained to understand and explain the line-of-sight use and ensure that users wear the receiver facing the correct direction. This is in addition to the same training that staff require for the FM devices. The design of a room should also be considered because rooms with darker walls and soft furnishings will have weaker signals.

To meet the building codes and access requirements an appropriate number of receivers with both neckloops and headphones need to be available.

Bluetooth on hearing aids

HAs and CIs are increasingly being provided with Bluetooth connectivity and it is often discussed that this Bluetooth can be used to connect in with sound systems. Unfortunately, the traditional Bluetooth technology does not allow this.

Wi-Fi and smartphone apps

There are some systems available that will upload the sound onto the Wi-Fi network, which a user can then stream to their smartphone via an app. Unfortunately, by using the public Wi-Fi network, the delay in the sound (called latency) makes this system unusable. Many users have the microphones on their hearing aids still turned on, and/or have open moulds, so they will hear the sound from the stream as an echo of the initial sound. For users who lipread, hearing the sound after seeing someone's mouth move can significantly reduce their understanding. These systems are not an appropriate alternative to hearing loops or receiver systems. The Australian standard requires no more than 40mS delay, which the public Wi-Fi network can't meet, even using the "low latency" receivers.

Bluetooth Low Energy (LE) and Auracast

In the a few years' time Bluetooth LE (fitted to hearing aids, cochlear processors, smartphones etc) and Auracast (transmitters to connect to the venue's audio system) will become available. This will be a Bluetooth system which can be used in a similar way to hearing loops. However, if multiple rooms are fitted with Auracast transmitters, it is envisaged that you will only be able to connect through your smartphone as to choose which room you want to listen too. This will have severe drawbacks for those who can't handle a smart phone, or where a single smartphone is shared e.g. elderly couple share one phone between them, or a family with children.

However, the HAs and CIs that are forward compatible with Bluetooth LE (e.g., Cochlear N8 processor) haven't been tested yet, and there are not any Auracast transmitters on the international market.

Once the system is fully developed and tested, it is envisaged that top end hearing aids will have Bluetooth LE. Over time, this will filter down to lower-level hearing aids. Then it will be over a decade after this for all hearing aids to be replaced with those fitted with Bluetooth LE. Remember, those who pay for their own hearing aids commonly do everything possible to extend their life – my record was 14 years. When paying off a mortgage, or being a self-funded retiree, coming up with $$$ is very difficult.

Therefore, I estimate over 15 years for the everyone to have hearing aids with Bluetooth LE.

Also, it will take time for venues to buy and install Auracast transmitters. Those who have installed hearing loop or FM systems will not be ready to rush out and buy new Auracast transmitters.

So, we will see a very gradual take-up of Auracast over a long period of time.

Conclusion

What is important is that we can hear clearly, regardless of the technology used, and that we know how to use the technology.

This involves the correct technology (both for the user, and by the venue), signage and training of the venue staff.

The international community is recommending both hearing loop systems and Auracast transmitters (when they become available).