



UNIT 1. UNDERSTANDING ACCESSIBILITY

Element 2. Learning Outcome 2

TRANSCRIPT: AUDIOLOGICAL TREATMENTS



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1 Slide 1

This is a presentation from LiveTextAccess: Training for real-time intralingual subtitlers.

2 Slide 2

This presentation is from the Unit 1: Understanding accessibility. Element 2: Target Users and their needs.

3 Slide 3

The overall topic of this presentation is Audiological Treatment and aided hearing.

Aided hearing includes as well the audiological treatment as the use of assistive listening system.

Two topics that are closely related to one another and therefore both topics shall be presented in this presentation, which also means, that this presentation shall be somewhat longer.

Professionals working as real-time subtitlers need to know and understand the different types of audiological treatments and how they relate to the needs of persons with hearing loss. In this video lecture we will discuss this topic.

My name is Aïda Regel Poulsen. I represent European Federation of Hard of Hearing - EFHOH. I am the secretary of EFHOH, and I have a hearing loss.

I have created this video lecture in collaboration with the SDI München.

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On completion of the training sequence, trainees will be able to:

- Distinguish between the different types of audiological treatment.
- Illustrate what Assistive Listening Systems are and how they work.
- Use the terminology related to this field.

5 Slide 5

The Hard-of-Hearing population use audiological treatments as one of the main technologies that support us.

Often this is not enough, and we add on use of Assistive Listening Systems (ALS). Some call it Assistive Listening Devices (ALD).

We often refer in writing to HA, CI, or BAHS, when the spoken word will be Hearing Aid, Cochlear Implant or Bone Anchored Hearing System. Same goes for ALS/ALD.

6 Slide 6

Audiological treatments.

7 Slide 7

Referring to a hearing test at the clinic, the Hard-of-Hearing client can be presented with different types of Hearing Aids, that could be relevant to try or use. Typically, the client will be presented with how the different Hearing Aids work. Often the audiologist can give some advice as to what is likely to work best for the client. Reimbursement works different from one country to another. Some European countries provide audiological treatment via national health insurance. In other countries the client needs to go to a private clinic and pay for the Hearing Aids himself. In some countries, national health insurance will pay part of the expenses for the Hearing Aids purchased from a private clinic. This means, that often the financial situation and cost of Hearing Aids is a huge argument in the final choice of which product the client may end up with. Let me give you an example: Cochlear Implants, in short CI, are provided via national health insurance in many European countries, and the operation is carried out through public health care. But in some European countries there are also private clinics offering Cochlear Implant treatments. In some European countries the client can have Cochlear Implant bilaterally. In other countries this is thought to be too expensive and there is a quota of how many Cochlear Implant operations can be done over a year. Some Cochlear Implant users have Cochlear Implant unilaterally and nothing on the other ear. Or they have Cochlear Implant unilaterally and a Hearing Aid on the other ear. Again, some get Cochlear Implant bilaterally. Just now, in 2020, there is research showing, that more Hard-of-Hearing people could benefit from Cochlear Implant but are not provided with it.

Bone Anchored Hearing System is not so commonly well known, but this also needs surgery, because part of the treatment relies on an implant.

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Audiological treatment needs to be carried out by professional audiologists: medical, technical and educational audiologists.

After the audiogram has been measured and other functions in the hearing have been tested (e.g. discrimination loss), different types of Hearing Aids may be relevant.

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The main 3 treatments are: first, Hearing Aids, in short HA, second; cochlear implants, in short CI, and third, Bone Anchored Hearing Systems, in short BAHS.

In general all Hearing Aids in the category needed can be fully adjusted to the needs according to the audiogram and other hearing tests. But different brands of Hearing Aids work differently, just like cars, shoes, clothes. The professional medical and technical audiologists will know what to look for when speaking to the patient. The patient may need to try out different brands to compare. This takes time, and it is difficult to change to compare. In different countries the period of testing different Hearing Aids vary. In Denmark it is 10 weeks. This is a limit set by the manufacturers. It is not beneficial to take too long to decide because once there is a hearing loss, hearing is also becoming difficult, so you need to settle as soon as possible. It is also important to know what programs are available in the Hearing Aids, and even though the same programs are available in different brands of Hearing Aids, the operation may feel different from one device to another. Some do fine with many different programs. For others, it is plenty to have just one, maybe two programs in their Hearing Aid. It is important to know if you can benefit from tele coil in your Hearing Aid and/or streaming (Bluetooth).

If you are a Cochlear Implant (CI) candidate, it is not possible to try out different brands before operation. Then it depends on the clinic which brands they offer, which companies they cooperate with. Cochlear Implants also have different programs. And also for Cochlear Implant, it is important to find out if you can benefit from tele coil and/or streaming (Bluetooth).

If you have a hearing loss (HL) at about 50dB, you have the dynamic range from 50dB to 120dB, which in total is a range of 70dB. And a pair of Hearing Aids will aid your hearing up to between 20-30 dB. In total you will then have a dynamic range of 90 to 100 dB. With a Cochlear Implant you get a dynamic range of 40 dB. This will typically be placed, or adjusted, in the level around the speech banana. Surrounding sounds will be put into the 40dB dynamic range. Bone Anchored Hearing Systems are for conductive losses only and can only be offered from certain audiological clinics.

10 Slide 10

Hearing Aids. Overall, all Hearing Aids do the same: they amplify sound for the client. But it is important to know which brand of Hearing Aid you have to know how it works. On this slide, I show you a few different types of Hearing Aids from the companies Phonak and Oticon. There are many more Hearing Aid manufacturers, but Phonak and Oticon are the companies who have responded to my request for pictures and information material for this presentation on audiological treatment.

Many of us use Behind-the-Ear (BTE) Hearing Aids to which we use a dome, as on the slide, to insert the Hearing Aid into the ear canal, or some use a mould which will fit more tight. This typically has to do with type of Hearing Loss. The bigger one's Hearing Loss is, the more likely is it that the client will need a mould. Family and friends, even hairdressers, are likely to comment on people's Hearing Aids and in general give advice on choosing a Hearing Aid that is less visible. But how the Hearing Aid looks is less important than how it sounds. However, these comments do fuel the stigma.

From Phonak, I also show Hearing Aids to be In-the-ear canal (ITE). They come in different sizes, and some are so very small, that we cannot see them when they are worn.

They are Completely in the ear Canal (CIC). But it depends on the degree of Hearing Loss, which type the client will benefit from the most. Also, for in-the-ear canal Hearing Aids, it is not always possible to add on use of Assistive Listening Systems.

11 Slide 11

We need to know which brand and type of Hearing Aid, the user has to know how it is operated and how it works. Also to know what types of programs are available in this specific brand and type, and which of the programs have been activated and which ones have not been activated. According to who the user is, what are the consequences of slimming or expanding the choice of programs. If the user uses the buttons on the Hearing Aids to operate the Hearing Aids, it is needed to toggle from, e.g. program 1 to 3, via program 2. This takes time. If the users uses a remote control or an app on the mobile phone to operate the Hearing Aids, it is possible to choose the program directly. But then it takes time to either get the remote control out of a bag or a pocket, or it takes time to open the app on the mobile phone. People are different what they prefer.

In some Hearing Aids, it is not possible for the user to adjust volume in everyday use. In some Hearing Aids the feature is there, but has not been activated. And for some, this feature has been activated. For many, newer Hearing Aids, if it is possible to adjust volume, it will often turn up/down the volume on both ears at the same time. But some users may need to turn up or down the volume in just one ear, according to the listening environment he or she is in.

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Cochlear Implant. Cochlear Implant candidates are people who do not benefit enough from Hearing Aids. This means that it is for people who have severe to profound Hearing Loss. If you are a Cochlear Implant candidate, it is not possible to try out different brands before operation. Then, it depends on the clinic which brands they offer, which manufacturers they cooperate with. It also depends if you have additional diseases for which you may need regular scannings. Only one brand is recommended if you need scannings. Cochlear Implants also have different programs, and also for Cochlear Implant it is important to find out if you can benefit from tele coil and/or streaming (Bluetooth) as Assistive Listening System.

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In Europe we have 4 manufacturers for Cochlear Implants. 3 of these responded to my request for pictures and information materials. They are: Cochlear, Oticon Medical and MedEI.

Cochlear Implants can be Behind-the-Ear, or a round, outer processor: in Cochlear it is called Kanso, in MedEI it is called Rondo. Some get a Cochlear Implant on one ear, unilaterally. Then they may be able to use a Hearing Aid on the other ear.

If the client gets a Cochlear Implant from Cochlear or MedEl, they will then need a Hearing Aid from a different manufacturer on that other ear. Whereas, if the client gets a Cochlear Implant from Oticon Medical, Oticon has the Hearing Aid to match the Cochlear Implant, and the two will be using the same platform for good connectivity.

Some get Cochlear Implant bilaterally. Many of the same issues, that I mentioned about Hearing Aids, count also for Cochlear Implants and it is needed to take the time and sort all these things out for each client.

14 Slide 14

Bone Anchored Hearing System, BAHS. This is typically for treating conductive Hearing Loss. There are different brands and different types. Surgery is needed. A screw needs to be implanted in the skull. BAHS is a well-known audiological treatment and has been known for many years, and yet it is also very new. Because surgery is needed, the BAHS are tried out with user wearing a softband at first. The BAHS will transmit sound vibrations to the skull. If this works, then a screw can be implanted, and the outer Hearing Aid can be attached to the screw like a snap lock. For many years there was only one manufacturer of BAHS, and this need was low priority. Now there are 3 manufacturers of BAHS: the Oticon Medical, the Cochlear and MedEl.

The Oticon Medical and Cochlear screws are identical, and this means that patients having had surgery with one of these products can change and try the other company's outer part of the BAHS.

When the BAHS is primarily for conductive Hearing Loss, it is important to know that conductive Hearing Loss can be caused by different malformations, or the Hearing Loss can be mixed conductive and sensorineural Hearing Loss, and there are different implants that can be used according to what type of mixed Hearing Loss it is. Also within the last 10 to 15 years, it is now possible to have BAHS bilaterally. This was not possible 10 to 15 years back.

15 Slide 15

BAHS users may also need Assistive Listening System, but it has taken longer to develop this accessibility for BAHS. Some BAHS users may therefore rely more on subtitling and speech-to-text in general. There is still research and development going on within the BAHS, which is good. Overall, there is ongoing research going on within all types of audiological treatments, be that Hearing Aids, Cochlear Implants, or BAHS. Many of the same issues, that I mentioned about Hearing Aids and Cochlear Implants, also count for BAHS, and it is needed to take the time and sort all these things out for each client.

16 Slide 16

Now about Assistive Listening Systems, in short ALS. In this part of the presentation, I shall talk about different types of Assistive Listening Systems, different technologies within Assistive Listening Systems and also about Assistive Listening Systems in use without an audiological treatment.

17 Slide 17

When we apply for Assistive Listening Systems, this is because we need further help than the audiological treatment provides us. The Assistive Listening System needs to be able to technically cooperate with the audiological treatment that we have received. The technology that covers most broadly is the loop and tele coil.

Since new technologies have come up along with the tele coil and loop, we have had a very long discussion if loop and tele coil is old fashioned. It is not. I should also like to draw your attention to the fact, that some people do not have a Hearing Loss that can be measured in an audiogram. But they will find it very difficult to, e.g. discriminate words, maybe struggle to determine where the sound comes from, and more things. And this is called APD, Auditory Processing Disorders. This is in the auditory pathways in the brain. Some of these will be granted an Assistive Listening System: the receiver for the Assistive Listening System may well look like a Hearing Aid, but this is a Radio Aid. Auditory Processing Disorder is a fairly new diagnosis, but this group may on top of using Assistive Listening System, also benefit from speech-to-text.

I should probably mention as well that several of the Assistive Listening Systems manufacturers also sell so called sound field systems. These are basically: when a speaker in a class or conference room uses a microphone and a number of loudspeakers are installed in the room. Unfortunately, in many places it so happens that these loudspeakers are not installed according to the acoustics in the room. Some places they do a wonderful job. In other places these systems cause more confusion to all in the room than they manage to support the individual who may need this kind of support. You can in particular tell if a system is not installed according to the acoustics in the room, if it is a loudspeaker which is suggested to be moved around.

18 Slide 18

EFHOH and IFHOH recommend that all Hearing Aids, Cochlear Implants, and BAHS have tele coil activated. Why do we do that? We have realized, that far too many receive Hearing Aids/Cochlear Implants with a tele coil in it, but it has not been activated. There are also Hearing Aids, where there is no tele coil to be found. The tele coil is of great help to a great number of us, when there is also a loop, that we can use, and this is up until now the easiest way to provide accessibility for Hard-of-Hearing population, that will benefit from using sound. Furthermore, tele coils and loops are fairly cheap.

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Loop and Tele Coil. Users' associations recommend tele coils in all audiological hearing devices to be activated and to work with loops. This means that users of audiological hearing devices find tele coil and loop to be a help and great support for us. Users also recognise, that there are times where we are together with others with Hearing Loss, and then we need a technology that works for us in common. So far, the loop and tele coil has been the only technology working well for us in these situations. When using tele coil and loop, there is not a bigger consuming of battery capacity in Hearing Aids, Cochlear Implants, or BAHS, which there tends to be using other technologies. When using tele coil and loop, there is no big delay in the audiological hearing systems, which there tends to be using other technologies. It is important knowledge what hearing technology the user of speech-to-text has to work with to identify what are the issues for this person to follow and understand communication. Assistive Listening Systems work on frequencies. It has happened that there has been interference between Assistive Listening Systems and speech-to-text technologies at various conferences.

20 Slide 20

Loop, which works with the tele coil, is the only Assistive Listening Systems that is IEC-standardised. IEC is International Electronic Commission. With tele coil and loop the user can have access to attending and participating in communications such as meetings, seminars, education, communicating at a distance, when there is or are microphones, and this even together with others with Hearing Loss. The joy of hearing together with and at the same time as others is tremendous. This is for us to stay in the hearing loop. In public, there are in some countries counter loops in many shops, hotels, ticket offices. Shown on the picture.

21 Slide 21

With counter loops users experience tends to be, however, that it does not necessarily work for us. But it could. What I have found myself has been: wrong installation of a counter loop, lack of knowledge from staff on how to use the equipment. It often takes instruction from me to staff on how to use it. This is disturbing our relation and communication, because it takes us talking about something completely different from what I came to that shop or ticket office for.

In museums and on guided tours it becomes more and more common to ask for a neck loop, and these work in general fine.

All these Assistive Listening Systems must be regularly checked and serviced, just like cars need to be checked and serviced. There is no system for this just yet.

22 Slide 22

Over the latest 10 to 15 years Assistive Listening Systems have gotten much better, as has audiological treatments as well. This means we have been able to include many more pupils with Hearing Loss in local school settings. With use of Assistive Listening Systems these pupils have now far better possibilities to follow lessons and social life throughout their education. In particular in schools where there are also pupils' microphones it can work very smoothly, rather than pass around microphones, which takes a lot of time.

23 Slide 23

Personal Assistive Listening System is for more individual listening. Users of Assistive Listening System need to sort out when they join in with others with Hearing Loss and they should preferably be on the same technology, otherwise speakers will need to use different microphones, and this will cause confusion throughout the event. When using loop for personal use, e.g. TV at home, this can be done using portable neck loop. But neck loops need to recharge batteries and you need to activate both the loop as well as your Hearing Aids/Cochlear Implants must be switched onto tele coil. Using a neck loop involves also either Bluetooth or frequency modulation transmission. The more technologies that need to work together, the higher risk of dropouts.

When you have a permanent loop installed in your living room to the TV, this is connected to the electricity or power in the house and all you need to do is switch your Hearing Aids or Cochlear Implants onto tele coil. Also, with permanently installed loop others with Hearing Loss can join in for the same program on the TV when they switch their Hearing Aids or Cochlear Implants onto tele coil mode. In my family we are more people with Hearing Loss, and I also have friends with Hearing Loss, of course.

Loops are cheap. Even the permanently installed ones are cheap and they last long. For instance I only had my amplifier renewed last year. The installation of the cord in my living room stayed the same, only amplifier was changed. The cost of this was around €130. The amplifier that did no more work I had had that for 32 years, and I expect this new one to last for the rest of my life. Just an example to show how easily and also cheap it can be done.

Loop and Tele coil is the only Assistive Listening System that has been IEC-standardized. The manufacturers are responsible to have their Assistive Listening System products standardized. This is not on the consumer.

24 Slide 24

Just like any other types of technology, the use varies, and the benefits differ from one situation to another and from one person to another. This is very difficult when applying for Assistive Listening System and not easily understood by granting authorities. At the same time, a lot of these situations could be solved better when society was more accessible and loops were installed in public places as well as good signing, text and, e.g. subtitles on screens in museums and public places in general, such as airports, train stations, waiting rooms at doctors etc.

25 Slide 25

When we have received our audiological treatment with Hearing Aids, Cochlear Implants, or BAHS, different brands tend to match certain brands within Assistive Listening System. However, loop fits in with all tele coils, no matter brand of Hearing Aids, Cochlear Implant, or BAHS. Quality of tele coils differ from one brand to another, and at the same time the tele coil needs to be rated (adjusted) just like the Hearing Aid itself needs to be tuned in. There is a huge lack of knowledge in this particular area of this professional field.

We also need to try out different types of Assistive Listening System, but this is often complicated, because we need to borrow the system to try it out for 3 to 4 weeks. This is very time consuming for the dealers and it takes up a lot of energy also for us users to try out and listen in different ways, involve family and friends in this try-out. It often also takes to write down your experiences and then go back to the clinic for further adjustments.

For now Phonak seems to be the biggest manufacturer of Assistive Listening System on the market. For most convenient operation of the Assistive Listening System it may be advisable then with Phonak Hearing Aids. But, and there is always a but, maybe the Phonak Hearing Aids are not what you are most comfortable with regarding quality of sound for your particular Hearing Loss. This is nothing about some products being bad quality. This is, just like when you try out shoes, there are different brands but once you try out the shoes, you feel one pair fits you best.

26 Slide 26

Other types of Assistive Listening Systems. We have through many years had Frequency Modulation, in short FM, as a transmitting technology in Assistive Listening System, but it has proven to have some difficulties.

Now Bluetooth (BT) has been introduced. It is still a fairly new technology in this field, and neither FM nor Bluetooth has been IEC-standardised.

27 Slide 27

I have added link in references on how the loop works for Hard-of-Hearing people. When I look up how Bluetooth works, it is all about how you pair your Hearing Aids with your phone. However, disadvantages that we do experience is that we hear from neighbouring people in trains or buses, because Bluetooth connects multiple and there are also occasions of dropouts. But many values this more individual Assistive Listening System greatly and the quality is improving. What is common for both systems is, that once you listen via loop or Bluetooth, you amplify the sound from the source you are connected to. You shall then seem less social in your family or community, because you have been enabled to focus more to the speaker, or TV, source of sound. You shall need to switch your Hearing Aid, Cochlear Implant, or BAHS onto microphone in Hearing Aid, Cochlear Implant, or BAHS to be able to listen to what the person next to you wishes to comment. This means you need to choose how you interact with others. Maybe remember something said during presentation, or a film and you can discuss it later. Hard-of-Hearing are not less social. We just listen in a different way and need to structure our working memory differently too, because we need to be able to talk about things later. Bluetooth LE means Bluetooth Low Energy.

28 Slide 28

And terminology.

29 Slide 29

Some of these terms were in particular mentioned in the presentation about hearing and hearing loss. But I add here also the typical types of audiological treatments and how this is in general shortened when we write about it. These abbreviations are very welcome in speech-to-text work.

30 Slide 30

There are 3 slides with list of terms, and this is second slide.

31 Slide 31

Third slide of list of terms. Please pay attention to the different brand names. They are not listed in list of terms, but during the work as speech-to-text interpreters, or subtitlers, brand names matter for us. We are target group for speech-to-text and it is very personal for us what we use. We each know the advantages and disadvantages of different brands. When we use speech-to-text for topics within audiology, we like these names to be spelled right.

32 Slide 32

And the summary.

33 Slide 33

This lecture has been about different audiological treatments and their benefits and discomforts. The need for use of Assistive Listening System when once audiological treatment has been carried through. The need for and use of Assistive Listening System is not always acknowledged. It is difficult for surrounding society to understand that we may even need speech-to-text, captioning, or subtitles, as well as audiological treatment and use of Assistive Listening System.

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A few exercises.

35 Slide 35

The exercises for this video lecture are in the Trainer's Guide and the PowerPoint file.

36 Disclaimer, acknowledgement and copyright information

Authors: Aida Regel Poulsen (EFHOH).

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37 Additional metadata¹

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