

# **A WORLD OF BAD SOUND: what you can do to protect your hearing**

## **Information for RSI Conference Interpreters**

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Acoustic shock and damage to hearing (temporary or permanent) are real risks for conference interpreters working in any environment and therefore, also when working remotely. Since the onset of the pandemic and the sudden increase in remote interpreting, there has been a lot of talk about acoustic shock and acoustic trauma. In addition to the well-known incidents that have received international attention, interpreters are complaining about hearing damage, tinnitus (a ringing, buzzing or roaring noise in the head) and hyperacusis (where normal environmental sounds seem amplified).

Unlike in the on-site and hardware world, where conventional consoles, like the Televic Lingua Desk, have built-in limiters, and on-site audio technicians can ensure levels are properly set, all platforms used for interpretation and/or video conferencing are for use “at your own risk” for all users -- including interpreters. But is a focus on acoustic shock and volume limiters the answer?

The fact is that sound in the online world is compromised. It is simply not as good as live sound at a venue. Why? The VOIP technology that RSI and conferencing platforms rely on is subject to packet loss, buffering, jitter, sound-degrading algorithms, feedback management, and audio compression, which all play a role in compromising the sound.

So what happens when the sound quality is degraded? Sound deprivation causes the brain and the mechanisms of the ears to work harder to process sound and differentiate background noise, the primary speaker’s voice, and their own interpreting voice. Exhaustion sets in more quickly as a result, and the common response is to turn up the volume. While there is a lot of talk these days about acoustic shock and hearing trauma, more attention needs to be paid to the damage that occurs from simply listening to lower quality sound and what we can do about it.

So what can you do?

- 1) **Know what the decibel recommended limits are** (generally accepted to be up to 85dB over the course of a day- source: US CDC NIOSH <https://www.cdc.gov/niosh/topics/noise/default.html>), and educate yourself on the topic on the exposure time. A very short burst of 108dB can do less damage than 95 dB sustained over a period of time
- 2) **Follow Basic Recommendations.** The US Center for Disease Control recommends the following steps in order to protect hearing, known as the Hierarchy of Controls: 1) Eliminate the Noise, 2) Buy Quiet Equipment and Tools, 3) Control the Noise Hazard, 4) use Exposure Time Limits, and 5) provide Personal Protective Equipment. While interpreters cannot ‘eliminate the noise’ or ‘buy quieter equipment and tools’ to do their work, the following are things that you can do to protect yourself:

**CONTROL THE NOISE HAZARD:**

- **Lower the Volume.** Set the volume to the lowest comfortable level in your computer settings and on your headset if it has an external volume control. Aim for no more than 50-60% of the maximum volume as your own maximum.

- Reduce Ambient Noise to the greatest extent possible. Fans, air-conditioning units, windows and doors that are open allowing for greater traffic noise, appliances and even loudly ticking clocks may cause you to turn up the volume more than you realize. Make your work environment as quiet as possible. Curtains, laundry baskets full of towels, rugs, carpets and professional sound absorbing materials can make a huge difference.

#### REDUCE TIME EXPOSURE

- Limit the amount of time you spend listening using headsets/headphones each day.
- Keep those virtual meetings where you are not interpreting as short as possible when you can control the length -- and limit your participation if you cannot.
- For when you working as an interpreter, convey the best practice of shorter on-line meetings to clients as appropriate. Working every day all day long on headset, online, is not recommended.
- Take regular breaks from noise.

#### PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment is very difficult for interpreters to employ.

- Headphones/Headsets with built in limiters. While most interpreters now know they should use high quality headsets (or headphones plus external microphones) that have a frequency range of 125-15 kHz (ISO standards), some headset brands now have built-in limiters. The Plantronics Soundguard line limits to 118dB and Sennheiser ActiveGuard limits to 115 dB. But these peak levels are significantly over the maximum level specified for simultaneous interpretation in the ISO Standards for Interpretation. These technologies will offer limited protection but cannot provide full protection from either acoustic shock or hearing damage. Acoustic shock and acoustic damage can occur at levels well below these limits.
- External Limiters. External devices like PreservEar, AdaptEar or LimitEar or apps, such as Element 26 Volume Limiter or Sourceforge Volume Limiter are to be approached with extreme caution. AICC Technical Committee tests have determined that these tools have an insufficient 'attack time' - meaning the damaging sound can still occur for a very short period of time, and can, therefore, still cause damage. In addition, some have been found to limit the volume too much for interpreters to work adequately.
- Instead commit to keeping the volume as low as possible while working, and protecting your hearing when you are not working, too. There are volume controllers for non-USB microphones, including ones by Sound Devices, TechRise and Shure and some USB microphones have external volume controllers which can be very helpful. Many find an external volume controller easier and faster to use than the software volume settings. Consider using noise meter apps to help you become more familiar with acceptable volume levels such as the [NIOSH Sound Level Meter App](#). You may be surprised how loud your environment really is! Consider keeping foam or other earplugs handy to protect your hearing when you are not interpreting, and especially when at concerts, festivals, movie theaters, bars, on public transport, when using loud small appliances, etc.

- 3) **Engage in Binaural Listening** – Listen with both ears. Many interpreters have a habit of pulling one side of a headset or headphones behind the ear when working so that they can better hear themselves. Having recently suffered an acoustic incident while wearing a monaural (single ear muff) headset, I am convinced that the monaural listening contributed to my problem. While struggling to hear a presenter who had an extremely poor computer microphone, we all turned up the volume to try to hear as well as we could. When she suddenly and without warning played a youtube video at higher volume, we all got a burst of much louder sound. I was then unable to hear for a number of minutes. I could make out some sound but the speech was unintelligible and I was unable to hear myself speaking. I am convinced that the stress of trying to process the very poor sound through one ear combined with the sudden loudness led to this. I suffered from tinnitus and hyperacusis for a period of time after this incident.
- Experts suggest that having a headphone resting on the bone behind your ear is even more dangerous for acoustic shock than wearing it normally.

- The brain is designed to process sound with BOTH ears, not one. Over time, listening using one ear only causes that ear to work harder to process the sound, and can, in itself, lead to long term hearing issues. The brain actually perceives sound heard through both ears as louder than sound heard through only one ear. This is called Binaural Loudness Summation. That means that most people will turn the volume up if listening with only one ear, and this, in turn can cause hearing damage over time. See resources at the end of this document.
- Headsets are designed to be “closed-back”, “semi-closed” or “semi-open” or “open-back”, which indicates the extent to which the sound is able to exit out of the headphone through the “cups” or “muffs”. Please note that this is independent of another headphone design parameter of the ear cups: on-ear (“supra-aural”) vs. over-the-ear (“circumaural”). It is possible to have an over-the-ear headphone that is also ‘open-back’ and an on-ear design that is ‘closed-back’. Interpreters need to use ‘open-back’ or at least ‘semi-open’ headphones to be able to hear themselves while working and listening to the input source with both ears. “In-ear” headphones, that go in the ear canal function as a “closed” environment are not recommended for interpreters. “Ear buds” which rest outside the ear canal provide a more “open” experience. <https://www.wirerealm.com/guides/different> This is an excellent article that explains the different types in detail: <https://www.wirerealm.com/guides/different-headphone-types-list>

- 4) **Educate clients about the need to provide the best audio possible.** Clients have no idea that interpreters require better audio than meeting participants and this must be explained to them. Interpreter need better audio because they are both listening and speaking at the same time, requiring them to listen to the speaker, filter out any ambient noise, and also hear themselves interpreting. What is adequate for participants may not be adequate at all for interpreters. Presenters and speakers should use dedicated microphones, and this must be clearly communicated as an expectation, for every event. The use of a computer’s built-in microphone generally far inferior to a separate microphone. USB headsets are the easiest to use and will make a huge difference. A set of smart phone in-ear earphones with a mic or even “airpods” will also yield far better results in most cases than a computer’s microphone and, though not ideal, will provide better audio for the meeting and the interpreters. Lapel mics that cost very little combined with a microphone controller are also a great option for clients who do not want to use a headset or invest in a heavier duty microphone. A Rode lapel mic and a TechRise controller cost about 35 Euro together. Make sure any intermediary, such as a platform company or LSC, also understands the need for separate microphones and explains it to clients. Provide written information about why separate microphones are important and try to demonstrate it if possible. Hearing is believing – every time. This link is very helpful: Hamlet being read using a cell phone, and different microphones: [https://vimeo.com/133871472?fbclid=IwAR2dbWzMqrSf4m0jHUnTD3lac\\_HDgRUiBqZqTscJ9dp\\_Bgy-sR5-n-obt1Q](https://vimeo.com/133871472?fbclid=IwAR2dbWzMqrSf4m0jHUnTD3lac_HDgRUiBqZqTscJ9dp_Bgy-sR5-n-obt1Q). If you are unable to hear well enough, do not be afraid to say ‘inaudible’ or ‘the interpreter is unable to hear’. This expectation – that interpretation will cease when the interpreter is not able to hear well enough – must similarly be explained to the client. While communicating the expectations to clients is perhaps the most difficult hurdle, it is absolutely critical and must be consistently addressed. One approach that has been very helpful is to focus not on the interpreters’ needs but on the client’s needs: the audio needs to be good enough for the meeting participants to hear well, and they will absolutely benefit from separate microphones used by presenters and speakers, but if they need to listen to the interpretation, they will be the ones to ultimately benefit –if the interpreters cannot hear well enough, they cannot do their job well and the interpretation will suffer. The need for good audio is ultimately the client’s need – not only the interpreter’s need.

## Conclusions

As a best practice, **take control of your own risk to the extent that you can. Knowledge and awareness about your hearing and about the sound that you are working with is your best defense.** As we move into more hub working environments and even some on-site work, always ask what protections are provided to guard against acoustic shock if such info is not provided to you. Do not assume you are protected simply because technicians are

present and professional equipment is being used. Do what you can to limit your own risk and to protect yourself. Know the level of risk you are taking on and make informed decisions.

Help set client expectations – make sure all parties you are working with have conveyed appropriate expectations to the client. Setting proper expectations consistently, across the market, from interpreters, language service companies, and most especially the platform companies – is key to creating conditions from which technical audio improvements will be made in the industry. Platform companies, in particular, must do a better job of communicating expectations to the clients.

Disclaimer: I am not an expert on this subject, but have tried to educate myself as much as possible and share that knowledge with interpreters. The information in this document is for informational purposes only and is my opinion. If are concerned about your own hearing or suffer an acoustic ‘incident’ of any kind, take a break from noise and seek medical attention.

## ARTICLES

Article about hearing loss and acoustic shock for interpreters by Sarah Hicky of Nimdzi  
[Hearing Loss and Acoustic Shock Public](#)

Article on RSI sound and its impact on interpreters, by Andrea Caniato  
**[The Proposed Pathodynamics of the Junk Sound Syndrome: Why RSI sound is bad for the interpreter’s ears.](#)**

Article on why RSI and virtual meeting sound is degraded, by Christian Guiducci  
[Headsets Won't Work Miracles - How Digital Sound Gets Degraded in the 21<sup>st</sup> Century - Christian Guiducci](#)

Article on How to Choose a Headset for RSI by Naomi Bowman (will be updated in early 2021!)  
<https://www.linkedin.com/pulse/how-choose-headset-rsi-remote-simultaneous-naomi-bowman/>

Article by Conference Interpreter Cyril Flerov on Decibel levels  
<https://www.linkedin.com/pulse/what-every-interpreter-must-know-decibels-cyril-flerov/?trackingId=JYLuu6nZbIDtgiu3szAvdQ%3D%3D>

Article about different headphone types: Closed Back, Open Back, Semi-Closed, etc.  
<https://www.wirerealm.com/guides/different-headphone-types-list>

## BINAURAL HEARING:

<https://www.audiology.org/news/notes-binaural-hearing>

<https://www.healthyhearing.com/report/51383-Why-do-we-have-two-ears#:~:text=With%20two%20ears%2C%20you%20are,clearly%20from%20the%20other%20side.&text=Having%20two%20ears%20compared%20with,from%20180%20to%20360%20degrees.>

<https://www.karger.com/Article/Fulltext/380741> The Importance of Binaural hearing

<https://www.scientificamerican.com/article/listening-with-two-ears-2006-09/>

<https://engineering.purdue.edu/SaylesLab/research/binaural>

## **GENERAL RECOMMENDATIONS ON HEARING LOSS PREVENTION:**

World Health Organization RECOMMENDATIONS

[https://www.who.int/pbd/deafness/activities/1706\\_PBD\\_leaflet\\_A4\\_English\\_lowres\\_for\\_web170215.pdf?ua=1](https://www.who.int/pbd/deafness/activities/1706_PBD_leaflet_A4_English_lowres_for_web170215.pdf?ua=1)

Understanding Noise Exposure Limits: Occupational vs. General Environmental Noise  
General info about safe noise levels

Noise and Hearing Loss Prevention - NIOSH Sound Level Meter App - NIOSH Workplace Safety and Health Topic  
Simple cell phone app for measuring noise in dB (also works if held up to headphones). Great for testing noise levels anywhere, anytime, and learning to recognize what is too loud. Also helpful for measuring the ambient noise in your work environment. That fan may be louder than you realize.