

HEARING LOSS HELP e-Zine
"The premier e-Zine for people with hearing loss"

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"Hearing loss may change your life,
but your life need not be any less
rewarding and fulfilling
because you have a hearing loss."

-- Neil Bauman, Ph.D.

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Please recommend and/or forward this issue of Hearing Loss Help e-Zine to at least one of your hard of hearing friends, or to anyone you know that is interested in successfully living with their hearing loss. We just ask that you keep this e-Zine intact and only forward it in its entirety, except delete your two personal links at the very end of the e-Zine.

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1. News Items

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"The Communicator" Clear Surgical Face Mask Now Available

by Neil Bauman, Ph.D.

For decades I've wished that doctors, dentists and other health care professionals would wear clear, surgical masks so that I could speechread them. I know many of you with similar severe hearing losses feel the same.

In the past, I've read about clear masks that had been invented, but I

never heard of anyone actually using them. Apparently a serious flaw was that these clear masks quickly fogged up from the wearer's breath, so they were useless for speechreading.

Then, in 2011, Nex-Gen Clear Surgical Masks became available. I wrote about these new face masks in my article "Clear Surgical Masks That Let You Speechread Your Doctor and Other Health Care Professionals Now Available!" at <http://hearinglosshelp.com/blog/clear-surgical-masks-that-let-you-speechread-your-doctor-and-other-health-care-professionals-now-available/> (or <http://hearinglosshelp.com/?p=4166> if the preceding link is broken).

Unfortunately, the FDA yanked them from the market in 2012 for not being sterile or sanitary enough in use. That's the bad news.

Now for the good news. My friend, Dr. Anne McIntosh, Ph.D., president of Safe'N'Clear at <http://www.safenclear.com/> received FDA approval at the end of 2016 for her new, clear, surgical face mask called "The Communicator".

"The Communicator" combines the best of traditional fabric face masks and clear plastic face masks so you can easily see the wearer's mouth, but don't have fogging problems because of their unique design.

Look at the difference! The traditional mask is impossible to speechread, while "The Communicator" makes speechreading a pleasure. You'd almost think there wasn't a plastic shield over the mouth, wouldn't you?

I've followed Dr. Anne over the past few years as she has worked hard to design, get approval, and bring to market this much-needed face mask.

More good news. The Communicator is manufactured right here in the USA so you don't have to worry about poor quality control.

Not only do these clear surgical masks help hard of hearing patients understand their masked health care professionals, but also, they help hard of hearing professionals communicate with their co-workers.

For example, a hard of hearing nurse working in the operating room is at a distinct disadvantage when masked doctors tell her to do something. If all the operating room staff wear these clear surgical masks, then any hard of hearing staff will be able to speechread them.

"The Communicator" clear, surgical face mask is now available for everyone—hospitals, doctor offices, medical facilities, dental

clinics, and you.

Spread the word and help these masks to catch on. Send this article (or just the URL) of to all your doctors, dentists, nurses, paramedics and health care professionals—anyone that typically wears a surgical mask. Let them know just how much these clear masks will help them effectively communicate with you. Ask them to get some of these clear face masks and wear them when around you (and other hard of hearing people) when you next visit them.

For further information on "The Communicator" clear surgical masks, email Dr. Anne at <mailto:info@safenclear.com> or go to the Safe'N'Clear website at <http://www.safenclear.com/>.

While Dr. Anne is setting up distribution channels, you can order "The Communicator" face masks directly from Safe'N'Clear. The introductory price for these masks is just \$1.50 each. You can obtain 40 of these masks in a dispenser box for \$60.00 ,or purchase a case (10 dispenser boxes) for \$500.00 (\$1.25 each) plus shipping/handling.

You can see a picture of "The Communicator" together with the original of this article on the Center's website. The permanent link for this article is [http://hearinglosshelp.com/blog/the-communicator-clear-surgical-face-m](http://hearinglosshelp.com/blog/the-communicator-clear-surgical-face-mask-now-available/) ask-now-available/ (or <http://hearinglosshelp.com/?p=4842> if the preceding link is broken).

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Hidden Hearing Loss

by Neil Bauman, Ph.D.

Perhaps you have heard the relatively-new term "hidden hearing loss" (coined in 2009) and wondered, "What in the world is hidden hearing loss?" After all, aren't all hearing losses hidden? Since you can't see a hearing loss, of course it's hidden. So why are researchers finally getting concerned about hidden hearing loss?

Introduction

The hidden hearing loss that researchers are talking about is not

about how to help us (hard of hearing people) better cope with our invisible hearing losses. Rather, hidden hearing loss is the new term researchers are using to describe hearing losses that do not show up on conventional audiograms, but are nevertheless very real.

Traditionally, audiologists have diagnosed hearing loss based on the increase in the sound level required in order to hear a series of tones produced by an audiometer. These results are plotted on an audiogram. This is the gold standard test used to determine hearing loss. (1) If your hearing loss does not show up on a standard audiogram, you have a hidden hearing loss.

Your first response is likely, "How can that be? How can you have a hearing loss that doesn't show up on an audiogram?" That's what audiograms are for—to show your degree of hearing loss—right?

You are correct—most of the time—but there are exceptions that do not show up on an audiogram. You see, there are a number of kinds of hidden hearing losses including auditory neuropathy and central auditory processing disorders for two. As Dr. Zeng explains, "At least some people with either of these disorders can have normal audiograms, yet still have impaired hearing function, especially those related to temporal processing [the timing of speech] and speech recognition [understanding what was said]." (2)

A third kind of hidden hearing loss is the current audiometric practice of only testing hearing up to 8,000 Hz. For example, you could have your hearing tested and show perfectly-normal hearing in the conventional testing frequencies between 125 Hz and 8,000 Hz, yet still have a severe hearing problem.

This is because your audiologist did not test your hearing between 8,000 Hz and the upper limit of human hearing (around 20,000 Hz). If you have a hearing loss in these higher frequencies and it's not tested, it is essentially hidden.

Fortunately, it is easy to "unhide" this kind of hidden hearing loss. All your audiologist needs to do is test your hearing to the highest frequency you can hear. I've been advocating testing these high frequencies for almost two decades, but audiologists seem to be totally set in their ways and choose not to see the value of such high-frequency testing, or have been brainwashed into thinking such high-frequency testing is not necessary.

I think it is vital to test your high-frequency hearing because high-frequency testing often provides an early warning of impending hearing loss in the conventionally-tested frequencies below 8,000 Hz. You see, hearing loss very often starts in the highest frequencies you can hear

and works its way down the frequency spectrum. A good example of this in action is progressive hearing loss resulting from taking ototoxic drugs, from excessive noise exposure and from the effects of aging.

Noise-Induced Hidden Hearing Loss

Recently, a fourth kind of hidden hearing loss has come to light. This hearing loss goes by the name of "Noise-Induced Hidden Hearing Loss" (NIHHL).

Noise-induced hidden hearing loss may be a bit of a misnomer because it refers to any functional impairment seen in people who have exposed their ears to louder noise, but have not had a resulting permanent hearing loss (what doctors call a permanent threshold shift [PTS]).

Unlike audiograms that disclose the degree of hearing loss from exposing your ears to loud sounds that results in a permanent threshold shift, this hearing loss hides behind normal audiograms. (1, 3)

Since there is no change in hearing sensitivity (no permanent threshold shift), these functional deficits cannot be detected using routine audiological evaluations and may be unknown to the people who have them—thus the moniker "hidden hearing loss". (4)

This is different from the conventional definition of noise-induced hearing loss (NIHL), which is based on changes in hearing sensitivity resulting in a permanent threshold shift and is thus visible on an audiogram. (4)

A typical scenario might be where you go to an audiologist complaining that you can't hear speech well when there is background noise present. You may even bring a family member with you who confirms that this is true. Or you may have a child whose school teacher is concerned that she isn't hearing well in the classroom.

After pure tone and word recognition testing, the audiologist explains that your hearing thresholds (or your child's) are within normal limits. In other words, as far as they are concerned, you have normal hearing.

If you are elderly, you might have a slightly different scenario. Your audiogram may show that you have some degree of high-frequency hearing loss—but that your degree of hearing loss is not consistent with the severity of your hearing complaints.

Based on the results of your hearing testing, your audiologist may confidently tell you, "your hearing testing shows that you have normal

hearing”.

Audiologist Dr. Hall explains, “In most such cases, this statement is inaccurate, misleading, and of no comfort to people and their families who are convinced that they have a real and serious hearing problem.” (5)

He adds, “A more appropriate response would be: ‘The results of your simple hearing test were within normal limits. Now, we’ll conduct a comprehensive evaluation of your hearing, including tests that measure how your ears and your brain process sound’.” (5)

The truth is, complaints of difficulty understanding speech in the presence of background noise are not uncommon in people with normal audiograms. (2) This is why people who have normal audiograms, but who also have noise-induced hidden hearing loss can hear just fine in quiet situations, but have difficulty understanding speech in noisy situations as compared to people with normal audiograms who do not have noise-induced hidden hearing loss.

Noise-induced hidden hearing loss can start at a young age. It is more likely to affect young people who attend loud music concerts, who frequent loud nightclubs or who spend time listening to loud music through headphones. (6) Note this well—every time you go to loud concerts or use loud power tools without ear protection, you may be losing cochlear nerve fibers and increasing your degree of hearing impairment. (7)

Once you have noise-induced hidden hearing loss, you’ll find it adversely affects your ability to detect high-frequency sounds and to hear in noisy settings. You won’t notice this hearing loss in quiet places, but you’ll struggle when you’re in bars or restaurants where there’s a lot of background noise present. (6)

Another insidious characteristic of noise-induced hidden hearing loss is that if you have noise-induced hidden hearing loss earlier in life, it leaves you more vulnerable to more severe permanent hearing problems as you get older. (8) For example, it accelerates the further loss of hair cells and cochlear neurons as you age, even in the absence of further ear abuse. (3)

In addition, it also leaves you vulnerable to auditory processing disorders in the future. (9) This is predicated on animal studies that have shown inner ear damage caused by loud noises can predict worsening hearing loss as you age, even without the death of hair cells. (10)

Hidden Hearing Loss Basics

In order to understand noise-induced hidden hearing loss, you need to learn some lesser-known facts about how your inner ears work.

To read the rest of this article (since it is too long for this eZine), click on the below link.

The permanent link for this article is on the Center's website at <http://hearinglosshelp.com/blog/hidden-hearing-loss/>.

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Constraint-Induced Sound Therapy for Sudden Sensorineural Hearing Loss

by Neil Bauman, Ph.D.

A man explained,

My wife suffers from tinnitus after sudden partial hearing loss in one ear. In her reading, she came across "Constraint-Induced Sound Therapy" and its potential benefits. Do you recommend this technique?

Constraint-Induced Sound Therapy (CIST) for single-sided Sudden Sensorineural Hearing Loss (SSHL) is quite a new technique. Published research on it didn't come out until January of 2014 so I doubt many hearing health care professionals know much about it yet.

I think constraint-induced sound therapy is a cool treatment and is worth considering if you have just had sudden sensorineural hearing loss in one ear. Unfortunately, in your wife's case, it probably is too late for her as you need to begin CIST as soon as possible after the sudden hearing loss—and certainly not more than 5 days later.

Before we look at the details of constraint-induced sound therapy, let's look a bit more at what exactly sudden sensorineural hearing loss is.

What Is Sudden Sensorineural Hearing Loss?

The CIST researchers defined sudden sensorineural hearing loss this

way.

1. Sudden sensorineural hearing loss is a hearing loss that occurs either instantaneously or over a period of up to three days.
2. Sudden sensorineural hearing loss is an inner ear hearing loss (sensorineural) as opposed to a middle ear (conductive) hearing loss.
3. Sudden sensorineural hearing loss is defined as an acute hearing loss of at least 30 decibels (dB) that occurs at three or more consecutive test frequencies on a standard audiogram.
4. For their purposes, CIST researchers define sudden sensorineural hearing loss as occurring in just one ear. (However, in truth, it can occur in both ears at the same time, although this is less common than sudden hearing loss occurring in just one ear.)

Causes of Sudden Sensorineural Hearing Loss

There are a number of causes of sudden sensorineural hearing loss. About 10% of the time, the cause is known—such as Meniere’s disease, head trauma, Autoimmune Inner Ear Disease (AIED), Cogan’s syndrome, genetic disorders, ototoxic drugs or retrocochlear disorders related to vestibular schwannomas, auditory neuromas, stroke, etc. (1)

In the remaining 90% of cases of sudden sensorineural hearing loss, the cause is typically unknown and thus diagnosed as idiopathic (cause unknown) hearing loss. The two most commonly suspected causes of idiopathic hearing loss are viral attacks to the inner ear and vascular problems (blood clots) in the tiny arteries in the inner ear. (1)

Is Sudden Sensorineural Hearing Loss Permanent?

Whether sudden sensorineural hearing loss proves to be permanent or temporary hinges on several factors. The most important factor is the severity of the sudden loss. Milder losses tend to be temporary, while more severe losses tend to be permanent. And between these two is an intermediate condition where some, but not all, hearing comes back. This is more common with moderate to severe sudden hearing losses.

One study revealed that normal or complete recovery occurred in 45% of the people with sudden hearing loss. Another study showed that 65% of the people recovered to functional hearing levels spontaneously and independently of any type of medical treatment. (1)

This is good news. It means that for a good number of people who experience sudden sensorineural hearing loss, their hearing will come back whether they have any treatment or not. Unfortunately, for other people, no hearing comes back in spite of any treatment given. For them, their sudden sensorineural hearing loss is permanent. For the rest, conventional treatment may improve the chances of their hearing coming back.

I say hearing “may” come back with treatment. You see, it is hard to tell whether the current conventional treatment causes hearing to return, or whether hearing, in such cases, would have returned by itself without any treatment.

The typical conventional treatment for sudden sensorineural hearing loss is taking a course of corticosteroids—typically Prednisone, Prednisolone, Betamethasone or Dexamethasone. If your doctor suspects a viral or vascular cause to the SSHL, he may include anti-viral drugs and vasodilators in addition to corticosteroids. Even so, “the efficacy of the corticosteroid treatment approach is fiercely disputed,” (1) since, according to one study, the hearing in patients who had received corticosteroids did not recover better than non-treated patients. (1)

Another triple-blinded, placebo-controlled, clinical trial “demonstrated that corticosteroids given in customary dosages did not influence hearing recovery.” (1) No doubt that is why some doctors refuse to prescribe corticosteroids for sudden hearing loss. They just do not believe it helps—either your hearing will come back on its own to some degree or other, or it won’t.

This is where constraint-induced sound therapy comes in. Studies show it can help more hearing come back than would otherwise occur without this new treatment. (1)

Since CIST can be used along with other treatments, if you feel that taking corticosteroids may help, you can take them along with CIST and cover more of your bases. However, the latest research seem to indicate that it is the CIST treatment alone that gives the increased hearing recovery, not concurrently taking corticosteroid drugs. (2)

Sudden Sensorineural Hearing Loss Causes Changes in the Brain

Besides the obvious changes to structures in the inner ear (e.g. ultimately death to hair cells among other things), sudden sensorineural hearing loss in one ear can (and does) cause changes in the brain itself. You see, our brains are plastic. This means they can grow and change to meet new conditions.

Researchers have recently discovered that one result of sudden sensorineural hearing loss is that it causes changes in neural activity in the central auditory system in our brains. This, in turn, results in physical changes in the auditory cortex (where sound signals are processed) due to the neural plasticity of our brains. (1)

One study demonstrated that our brains begin to reorganize the auditory cortex within a few days of sudden hearing loss. Now get this. The degree of cortical reorganization correlated negatively with the recovery rate from the sudden hearing loss. (1) In other words, the more our auditory cortex reorganizes, the less likely we are to recover from sudden hearing loss.

Therefore, it appears that preventing the auditory cortex from reorganizing itself may be one of the keys to successfully treating sudden sensorineural hearing loss. And this brings us to constraint-induced sound therapy.

What Is Constraint-Induced Sound Therapy?

The concept of constraint-induced sound therapy is intriguing. The basic premise is that if you suffer a sudden sensorineural hearing loss in one ear, your brain reorganizes itself—what the researchers call “maladaptive auditory cortex reorganization”—to pay more attention to the signals coming from the better (or normally-hearing) ear. This makes total sense. For example, if you have a sudden hearing loss in one ear, you naturally and automatically switch to paying more attention to the sounds your better ear hears. (2) In short, you listen more with your better ear.

What happens next is that this new listening behavior increases the neural activity corresponding to your better ear. At the same time, your brain reduces neural connections between your bad ear and the auditory cortex. (2)

Thus, if hearing later comes back to the affected ear (either spontaneously or via amplification such as wearing a hearing aid), your brain may have already learned to largely ignore sound signals from your bad ear. The result is that your bad ear becomes a “second-class citizen” and is more or less ignored.

Constraint-induced sound therapy tries to prevent this maladaptive auditory cortex reorganization, induced by “non-use”, from happening. The obvious way to prevent this reorganization is to make your brain hear about the same from both ears. You can do this by blocking (constraining) sounds from the good ear, while at the same time stimulating output (enhancing sounds) from the bad ear.

The result is that from your brain's perspective, both ears are now hearing more or less equally. Therefore, no auditory cortex reorganization is necessary, and thus does not take place.

In order to make this happen, since one ear has suffered a sudden hearing loss, you either have to quickly "correct" this hearing loss in the bad ear, or you have to temporarily "damage" the good ear so it hears at roughly the same level as the bad ear. In actual fact, CIST takes both of these approaches at the same time. Here is how it does this.

To read the rest of this article (since it is too long for this eZine), click on the below link.

The permanent link for this article is on the Center's website at <http://hearinglosshelp.com/blog/constraint-induced-sound-therapy-for-sudden-sensorineural-hearing-loss/> (or <http://hearinglosshelp.com/?p=4826> if the preceding link is broken).

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2. Beware of (Ototoxic) Drugs That Can Damage Your Ears
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Tapering Off Citalopram Safely Without Side Effects

by Neil Bauman, Ph.D.

A man explained,

I was on Citalopram for 2 years and had no noticeable side effects —no tinnitus. I've never had tinnitus other than in my younger days for a few hours after going to a nightclub!

Three months ago I thought I was ready to come off. Having discussed with my doctor, I did this slowly over 3 weeks. At the end I developed tinnitus and a strange "brain zap".

I can only describe this as a pulse that races inside from the top of the head to the neck, maybe down one arm, maybe both or maybe down the spine as well.

I also got extremely and undeservedly irritable when I came off, so I went back on slowly building the dose back up. As soon as I started taking it again, the symptoms went.

Due to other problems, my doctor has switched me to another SSRI. Again, I gradually reduced the dose and now tinnitus and brain zaps are back. Also very irritable/angry for the first few days after stopping.

The tinnitus is mild and only really noticeable when sitting quietly. The brain zaps are intermittent but constant. Not debilitating but very aggravating.

This is not looking good. What has this drug done to me?

When you try to come off Citalopram too fast you open yourself up to all sorts of side effects including "irritability, agitation, dizziness, sensory disturbances (e.g., paresthesias such as electric shock sensations), anxiety, confusion, headache" among other things. (1)

Besides your tinnitus, you are specifically experiencing three of the above-mentioned side effects, namely irritability, agitation and paresthesias (abnormal sensations typically tingling or pricking) such as the electric shock sensations you are experiencing that you describe as "brain zaps".

These are all indications that you tapered off the Citalopram much too fast. This stems from the fact that you thought you were doing a SLOW taper over 3 weeks. However, in actual fact, you did a very FAST taper. A slow taper would take you somewhat over a YEAR to complete.

You are also fortunate that you only got tinnitus when you tried to get off the Citalopram. A good number of people get tinnitus soon after they start taking this drug. And for many of them, their loud tinnitus never goes away. I have received more anecdotal reports of side effects (mostly of tinnitus) from people taking Citalopram than for almost any other drug. That's how common tinnitus is from taking Citalopram.

The Royal College of Psychiatrists recommends that you reduce slowly. Unfortunately, their idea of slowly is this: "if treatment has lasted less than 8 weeks, stopping over 1-2 weeks should be OK. after 6-8 months treatment, taper off over 6-8 weeks. Be prepared to stop the reduction or increase your dose again if needed." (2)

To be sure, this taper speed works for numbers of people.

Many people seem to be able to taper off psychiatric medications in a couple of weeks or even cold-turkey with minor withdrawal symptoms perhaps for a month or so. Doctors therefore expect everyone can do this. However, a minority suffer severe symptoms for much longer. (3)

It seems that most doctors don't appreciate the need for a greater margin of safety in reducing the risk of side effects by GRADUALLY reducing the dosage. Thus, they usually advise tapers that are much too fast. (2)

However, there are numbers of people like you that cannot follow this fast taper without problems such as you have been experiencing. You need to do a much slower taper that can take a year or more to complete. When you do this, you (hopefully) can finally get off Citalopram without experiencing the negative side effects that faster tapers cause.

The problem is, no one knows in advance how their nervous systems will respond to any speed of taper until they try it—and then it can be too late. Thus, a wiser approach is to do a slow taper in the first place than to try to put your nervous system back together again after you have wrecked it by too fast a taper. (3) "It's a Humpty-Dumpty situation. Once your nervous system falls off that wall, there's not much that can be done to put it together again." (3)

A good rule of thumb is to taper your dose by 10% PER MONTH. This 10% rule holds for Celexa, as well as for other psychiatric drugs. (2)

This 10% taper is a "harm reduction" approach to going off psychiatric drugs. This conservative approach causes the least harm to the greatest number of people. Unfortunately, a few people will still experience side effects, even at this slow rate.

"If you are very sensitive to dosage reductions, you may have to reduce by very, very small amounts, less than 10% per month, or hold for even longer than a month at a time." (3) For example, you may need to do a 5% taper, or take longer intervals between each step—such as 6 weeks instead of 4 weeks per step. Do whatever works for you so that you don't experience side effects as you taper off this drug.

Note that you reduce your dose by 10% per month, calculated on the LAST dosage you took, not the INITIAL dosage. (2)

Here is the WRONG way—a straight taper off the initial dose. For example, say you were on a high dose of 40 mg per day. A straight 10% taper would be to reduce your dose by 4 mg each month—and after 10 months you'd be off the drug. This is too fast a taper and you will

likely find that negative side effects will crop up.

The RIGHT way to do a 10% taper is to taper 10% off the LAST dose you took. For example, again say you were on a dose of 40 mg per day. To do a 10% taper you'd do the same as the above for the first month. 10% of 40 is 4 mg. So for the first month you'd take $40 - 4 = 36$ mg/day. Then for the second month, you'd reduce this by 10% of the 36 mg. So the second month you'd take $36 - 3.6$ mg = 32.4 mg/day. For the third month you'd reduce this by 10% and thus take $32.4 - 3.24$ mg = 29.16 mg/day and so on.

Tapering like this—10% on the reducing balance—will go on forever with ever smaller quantities. Thus, at some point you need to simply “jump off”. However, don't “jump off” too soon. As you get to a smaller and smaller dose, you must taper EXTRA slow, not faster. (3) This has to do with the percentage of receptors in your brain that the Citalopram is occupying. So just go extra slow in the taper at the end before you finally “jump off”.

If you find this protocol too slow, you can always speed things up by making the 10% reductions more often—for example, every 3 weeks or whatever interval works for you. However, if you get any withdrawal symptoms, this is your nervous system's way of telling you that you are tapering too fast and you need to switch to a slower taper. (3)

Now for some practical considerations. Since Citalopram comes in 40, 20 and 10 mg tablets, how do you precisely measure a “funny” dose such as 29.16 mg?

What you do is use the various strengths of the tablets combined with a liquid form of Citalopram. (You could also split the tablets, but this can be quite inaccurate unless you have sensitive scales to accurately measure each piece.)

For example, in the above case of a dose of 29.16 mg, you could take a 20 mg tablet and the equivalent of 9.16 mg of the liquid form of Citalopram for that particular dose.

Note that in the US, the liquid oral solution comes in 10 mg/5 mL (2 mg/mL). (2) So in this case you want to take $(9.16 \times 5)/10 = 4.58$ ml of the liquid Citalopram plus a 20 mg tablet.

To measure tiny precise amounts of the liquid form of Citalopram, you need an oral syringe. You can learn more about oral syringes and how to use them at

<http://survivingantidepressants.org/index.php?topic/235-using-an-oral-syringe-and-other-tapering-techniques/> (or <http://tinyurl.com/jen72k2> if the preceding link is broken).

As you can see in retrospect, it is much better if you use natural means (diet, counseling, etc.) to deal with mental/emotional health issues and stay away from SSRIs and other mind-altering drugs. Then you don't have to worry about all the horrible side effects when you try to get off these drugs.

(1) Citalopram Tablets.

<https://www.drugs.com/pro/citalopram-tablets.html>

(2) Tips for Tapering Off Celexa (Citalopram).

<http://survivingantidepressants.org/index.php?/topic/2023-tips-for-tapering-off-celexa-citalopram/> (or <http://tinyurl.com/j7cggc5> if the preceding link is broken).

(3) Why Taper by 10% of My Dosage?

<http://survivingantidepressants.org/index.php?/topic/1024-why-taper-by-10-of-my-dosage/> (or <http://tinyurl.com/7f6b8dx> if the preceding link is broken).

The permanent link for this article is on the Center's website at

<http://hearinglosshelp.com/blog/tapering-off-citalopram-safely-without-side-effects/> (or <http://hearinglosshelp.com/?p=4828> if the preceding link is broken).

The Contacta HLD3--the "Ferrari" of Home Loop Systems

If you want unparalleled performance on the road, the 975 horsepower LaFerrari is the car to have. Mind you, it will set you back a cool 1.1 million dollars.

By the same token, if you want unparalleled performance in a home loop system, the sleek Contacta HLD3 is the loop driver to have. It is the Ferrari of home loop systems. And the good news is that you can "drive it home" for a mere \$249.00.

How Good is the HLD3? Glad you asked.

One of my customers explained, "I am very pleased with the performance of the HLD3 Loop Driver. It gives me greater volume and clarity so I

have retired the streamer that came with my expensive hearing aids."

Since hearing aid manufacturers specifically design their streamers to work hand in glove with their accompanying hearing aids in order to get top clarity from your TV, you'd think that combination would beat the pants off the HLD3 loop system. But as this man explained, they don't. It's the HLD3 that zooms past to take the top spot.

This is high praise indeed for a loop system. So, when you want the top-performing loop system--one that gives you beautiful, clear sound, think Contacta HLD3-the Ferrari of home loop systems.

To learn more about this wonderful loop system, and "drive one home", go to

<http://hearinglosshelp.com/shop/contacta-hld3-hearing-loop-system/>.

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3. Understanding Hearing Loss
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Should I Wear a Hearing Aid in My Ear That Has Poor Discrimination?

by Neil Bauman, Ph.D.

A young lady wrote,

I have a 30 dB hearing loss in my left ear although I still have 100% word recognition. However, my right ear has an 80 dB hearing loss, but only 8% word recognition. My doctor told me that due to this, my right ear is not eligible for a hearing aid. She said even if I hear speech in my right ear, it will be highly unrecognizable and distorted. Is this true?

Does this mean I have severe hearing loss in my right ear and normal hearing in my left?

In crowds, with a lot of background noise, I feel like I can't hear anything. Also if a phone rings or a baby cries, I can sort of hear it, but I cannot possibly find where the sound is coming from. I was wondering if you knew why this was.

A 30 dB hearing loss is a mild loss. Don't let the term "mild" fool you. You still miss a significant amount of quiet sounds, although you will still hear louder sounds.

An 80 dB hearing loss is, like you already know, a severe loss. This means you don't hear much with that ear—only loud sounds. However, you can still hear a "lot". I have an 80 dB loss in both ears and I still think I hear a "lot", but I know I miss ever so much more than I hear. Thus, to answer your second question. You have a mild hearing loss in one ear and a severe hearing loss in the other.

Therefore, in order to correct your lack of hearing, you need hearing aids to amplify sounds so you can hear them. Most people only think you need more volume to hear. This is only one aspect of hearing loss.

The second aspect of hearing loss is how much you understand of what you hear—what audiologists call speech discrimination or word recognition. If you have 100% word recognition, you understand everything you hear. 80% word recognition means you understand 4 out of every 5 words you hear. This is still quite good as your brain often can fill in the missing words from the context of the sentence, unless you happen to miss a key word. Then you may miss the meaning of the entire sentence.

Your bad ear only understands 8% of what it hears. This is very poor discrimination. Basically, that ear just gives you gibberish. You'll only understand every twelfth word. So if you hear someone talking, you'd hear something like this.

"Gibberish, gibberish, car, gibberish, dishes."

Not very edifying is it?

If you wore a hearing aid in that ear, all you'd hear is louder gibberish for the most part with an English word thrown in now and again. Wearing a hearing aid won't magically make this gibberish into English. Thus, what your doctor said is true.

However, if you are a good speechreader, even with only 8% discrimination, you could still understand a lot more of speech than your level of discrimination would indicate. You will get the cadence of speech via your hearing aid (and the odd word you understand) and this will help you immensely with your speechreading accuracy. Your brain will put together what you hear with what you see (speechread)

and surprise—you'll find you understand quite a bit.

Having said that, you will likely find that if you wear hearing aids in both ears, all the gibberish your bad ear hears and sends to your brain will overpower the good sounds from your better ear. This makes it much harder for your brain to separate the good sounds from the gibberish. The result will be that you won't understand as much as you would if you only wore a hearing aid in your better ear. Besides, you'll feel much more tired and cranky as the day wears on.

If you find that this is your case, then you should only wear a hearing aid in your better ear, especially when you are in relatively quiet places.

Now let's look at why you have so much difficulty understanding speech in noisy places. In order to extract speech from background noise, you basically tell your brain to listen to just the sounds coming from one person's mouth. In order to do that, your brain has to focus on the sounds coming from that specific location. And in order to do that, your brain needs two separate sound signals of that person talking.

As an analogy, think of the difference between a flat (2D) picture and a 3D picture. In the former—you see the various objects as though they were all the same distance from you (the speech is all inter-tangled with the background noise). You can instantly see this effect by shutting one eye (or ear).

However, if you want to see this same picture in 3D, you need both eyes (ears), each sending a slightly different set of signals to your brain. The result, is that your brain triangulates (focuses) on the person you are wanting to see (hear), and he suddenly stands out from the background.

Since your bad ear can't hear that person talking, only your better ear sends that sound signal to your brain. Thus your brain doesn't have the critical information it needs to make that person's voice "pop" out of the background racket. Essentially, you are only hearing in 2D, not 3D. This makes extracting speech from background racket almost impossible.

If you wore a hearing aid in your bad ear in such cases would just make everything even worse, because now your brain would have to contend with an enormous amount of gibberish as well.

Furthermore, the reason you can't tell the direction from which sounds are coming is also related to your lack of binaural hearing. You see, in order to locate the source of sounds, a baby crying, the phone ringing, etc., you also need two working ears. Your brain uses the

slight difference in the volume of the sounds reaching each ear and the tiny difference in time these sounds reach each ear, to figure out from which direction the sound is coming.

When your brain only has one signal coming in, it doesn't have the critical time delays and volume differences to triangulate the direction of the incoming sound. The result is that you just hear the sound, but don't have a clue where it is coming from.

In such situations, you may gain some benefit from wearing two hearing aids. When you wear two hearing aids, as long as both of your ears can pick up the same sound, then your brain has the sound delays and volume differences it needs to calculate direction. Thus, you may find you have your directionality back.

Some people in your situation do wear two hearing aids when out and about so they can hear the direction from which warning sounds are coming—for example, a siren, horn honking, person shouting a warning, etc.

This can work quite well since you don't have to understand speech in these situations, you just have to hear the sound. Note: this is only going to work when the background noise isn't so loud that it buries the sound you want to hear.

To summarize:

1. In quiet situations, wear a hearing aid in your better ear and not one in your worse ear. This will let you hear the best without amplifying the gibberish your worse ear hears.
 2. In noisy situations, you may find that even wearing a hearing aid in your better ear doesn't help, so you may want to take it off and see if you hear and understand better without it.
 3. When out and about, you may find that wearing two hearing aids will help you identify the direction of warning sounds, but they won't aid in understanding speech.
 4. Finally, in all situations, use your eyes. Your eyes are now also your "ears". Speechread all the time and your brain will put together what your eyes see and what your better ear hears. The result is that you will understand speech much better than you otherwise would. After all, that's exactly what you want.
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The permanent link for this article is on the Center's website at <http://hearinglosshelp.com/blog/should-i-wear-a-hearing-aid-in-my-ear-that-has-poor-discrimination/> (or <http://hearinglosshelp.com/?p=4845> if the preceding link is broken).

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Obstructive Sleep Apnea, CPAP Devices and Hearing Loss

by Neil Bauman, Ph.D.

A man wrote,

I have sleep apnea and I use a CPAP machine every night. When I searched the Internet using Google to find out whether there is any link between sleep apnea and sensorineural hearing loss, I found many articles suggesting a link. I would like to hear your opinion on sleep apnea and hearing loss. What's the recovery chance if lack of blood flow has caused the sensorineural hearing loss in my case. (That's the case for many sleep apnea patients.)

Obstructive sleep apnea (OSA) is a growing problem, affecting millions of people in the United States. Some form of obstructive sleep apnea affects approximately 17% of the adult population. Throughout the years, this number has been increasing in tandem with the increasing prevalence of obesity. (1) If you have obstructive sleep apnea, chances are, you're likely to have some sort of an ear problem whether it arises directly from your ears or not. (2)

So far, studies have shown there is an association between sleep apnea and hearing loss. However, since these studies only collected data at a single point in time, it has been impossible to know which came first—the sleep apnea or the hearing loss. (3) Thus, it's hard to say for sure whether sleep apnea causes hearing loss or whether both arise from the same underlying cause.

For example, obesity and snoring are two common factors causing sleep apnea. Both of these factors could also cause hearing loss by themselves whether you had sleep apnea or not. You could also wonder whether your hearing loss is due mostly to blood vessel damage from arteriosclerosis, or whether it is due to vibratory damage due to snoring, or even something else (3) such as using a CPAP machine to treat your sleep apnea? In this latter case, is it the sleep apnea

itself, or is it your CPAP device that resulted in your hearing loss?

As you can see, there are a number of factors that may be involved in any resulting hearing loss.

Here is a quick review of obstructive sleep apnea to refresh your memory. If you have obstructive sleep apnea, when you sleep your breathing tends to be very slow and shallow (hypopnea), you snore and from time to time you stop breathing (apnea).

You get obstructive sleep apnea when part of your airway closes off while you are trying to inhale during your sleep. This more often occurs if your airway is slightly narrower than normal, or if you are obese.

Note: studies have revealed that hearing loss is more severe in people that have higher body mass indices. (4) Therefore, losing weight is one of the best ways to help get your sleep apnea under control.

If you are overweight, and if you have a lot of excess fat in your neck, this extra fatty tissue tends to narrow your airway as well. This results in a higher risk of developing obstructive sleep apnea. (5)

When you begin to inhale, your lungs expand. This lowers the air pressure inside your airway and air rushes in to fill this partial vacuum. However, if the muscles that keep your airway open are not working hard enough, your airway may narrow or may collapse. This stops any air flowing into your lungs. (5)

The reason obstructive sleep apnea occurs while you are sleeping is because the muscles in your neck that keep your airway open are not as active then. (5)

Furthermore, congestion in your nose and sinuses can make an airway collapse even more likely because the extra effort you need to put forth to inhale will lower the pressure in your airway even more—thus sucking your airway shut. (5)

You can make things worse for yourself if you drink alcohol or take tranquilizers in the evening because these cause your neck muscles to relax even more than normally. (5)

Note that such drugs also lower the “respiratory drive” in your nervous system. (5) The result is that your breathing becomes slower and more shallow (hypopnea).

People with obstructive sleep apnea almost always are heavy snorers.

This is because the same narrowing of the airway that causes snoring can also cause obstructive sleep apnea. In fact, snoring may actually be a factor in obstructive sleep apnea. This is because the vibration of your throat tissues can cause them to swell" (5) and this partially closes your airway.

Since sleep apnea is characterized by your airway closing while you sleep, the result is that your blood oxygen levels drop each time this happens, In extreme cases, this may occur as many as 400 to 500 times a night.

Most of the complications associated with sleep apnea, which include high blood pressure, heart problems, strokes and diabetes, are thought to result from these frequent oxygen fluctuations during the night. (6)

Obstructive sleep apnea is often treated with a mask and breathing device, called a continuous positive airway pressure (CPAP) device. Even so, one of the most effective treatments is simply to lose weight. (6)

Did you notice that the above references did not even mention hearing loss and other ear problems? This shows how much importance the medical community gives to our ears. Thus, few people realize that obstructive sleep apnea can permanently damage their precious hearing. As a result, they (and their doctors) don't take the steps necessary to help prevent this from occurring.

Now, let's look at how obstructive sleep apnea can affect your ears.

To read the rest of this article (since it is too long for this eZine), click on the below link.

The permanent link for this article is on the Center's website at <http://hearinglosshelp.com/blog/obstructive-sleep-apnea-cpap-devices-and-hearing-loss/> (or <http://hearinglosshelp.com/?p=4841> if the preceding link is broken).

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Hypoacusis and Other Words Ending in -acusis

by Neil Bauman, Ph.D.

Doctors, audiologists and other medical professionals use medical jargon that can snow under the average person. When it comes to our ears and our hearing, they may diagnosis us with terms like paracusis, or dysacusis or hypoacusis and we don't have a clue what they have just said.

Here's a primer of all those words ending in -acusis to make all this easy to understand.

First, you need to know that the root word "acusis" is from the Greek word "akousis" meaning hearing. Thus any word ending in -acusis is referring to hearing in some way.

Second, the prefix is generally also Greek and refers to a specific characteristic related to hearing.

With that it mind here are a number of words ending in -acusis in alphabetical order.

ANACUSIS — [AN-ah-KOO-sis] "An" is the Greek word for "not" or "without". Thus an-acusis is "without hearing"—what we commonly call totally or completely deaf. The formal definition of anacusis is, "total loss or absence of the ability to perceive sound as such".

DIPLACUSIS — [DIP-lah-ah-KOO-sis] "Dipl" is from the Greek word "diplous" meaning "double" or "twice". Thus dipl-acusis is hearing the same sound twice. The formal definition of diplacusis is "abnormal perception of sound either in time or pitch so that one sound is heard as two". You may hear the same sound repeated twice (almost like an echo), or you may hear the same sound at two different pitches. For example one ear may hear the sound at the correct pitch and the other ear hears it either higher or lower in pitch. This can really mess you up if you are a musician.

DYSACUSIS — [DIS-ah-KOO-sis] "Dys" is from the Greek meaning "bad" or "difficult". Thus dys-acusis is technically difficulty hearing. In medical usage it is defined as "1. Any impairment of hearing involving difficulty in processing details of sound as opposed to any loss of sensitivity to sound. 2. Pain or discomfort in the ear from exposure to sound." Thus dysacusis is sometimes used when you can hear, but not understand what you are hearing. Other times it can refer to the pain or blocked feeling you have after exposing your ears to loud sounds.

HYPERACUSIS — [HIE-per-ah-KOO-sis] "Hyper" is from the Greek prefix

meaning "over" or "above". Thus, hyper-acusis is hearing that is above normal. The medical definition of hyperacusis is "abnormal hearing sensitivity". People with hyperacusis perceive all (or certain) sounds as much louder than they really are. This is often the result of exposing your ears to loud sounds or from taking certain ototoxic drugs.

HYPOACUSIS — [HIE-poe-ah-KOO-sis] "Hypo" is the opposite of "hyper" and is from the Greek word meaning "under" or "less than". Thus, hypoacusis is hearing that is less than normal—in other words, a hearing loss. The formal definition is "hearing impairment of a conductive or sensorineural nature".

HYPACUSIS — [HIP-ah-KOO-sis] "Hyp" is a shortened form of "hypo". Thus hyp-acusis is identical in meaning to hypo-acusis. It just means you have a hearing loss.

PARACUSIS — [PAH-rah-ah-KOO-sis] "Para" is a Greek prefix meaning "abnormal" or "at the side of". Thus para-acusis is hearing that is not normal in some way (which would include, but is not limited to a hearing loss), or more commonly "weird" hearing in much the same way we talk about the difference between "normal" and "paranormal" things. The formal definition of paracusis is "1. impaired hearing; 2. auditory illusions or hallucinations". It is mostly used in the latter sense—for people hearing phantom sounds, or people that hear one sound, but their brain's perceive it as another sound (illusion). Thus, if you have Musical Ear Syndrome, you have paracusis.

PARACUSIS, FALSE — There are other "flavors" of paracusis such as "false paracusis" which is "the apparent increase in hearing of a person with a conductive hearing loss in conversation in noisy surroundings because of others speaking more loudly". This is also true of those of us with a severe reverse slope hearing loss. Because we do not hear the loud low-frequency sounds very well, and because people with normal hearing talk or shout to be heard over the racket, we hear them very well. This is one situation where I used to say (tongue in cheek), "Don't yell at me. I'm not deaf!"

PARACUSIS LOCI —Another flavor of paracusis is Paracusis loci. "Loci" is the Greek word for location. Paracusis loci is defined as "loss or diminution of the power of determining the direction of sound". One way you can have paracusis loci is if you hear differently in each ear. Thus if there is a fainter sound at some distance, your better hearing ear will hear it, but your worse hearing ear won't. Thus you can't tell from which direction the sound is coming. This is also true if you are deaf in one ear.

PRESBYACUSIS — [PRES-bee-ah-KOO-sis] "Presbys" is the Greek word for

"elder" (old man). Thus, presby-acusis is hearing loss associated with aging. The formal definition of presbyacusis is "loss of ability to perceive or discriminate sounds associated with aging; the pattern and age of onset vary". Note that currently presbyacusis is typically spelled without the "a", thus, "presbycusis". Both forms are correct.

SOCIOACUSIS — [SOE-see-oh-ah-KOO-sis] "Socius" is the Latin word for "companion" and by extension "society". Thus socio-acusis is hearing loss resulting from the effects of living in a noisy society. The dictionary much more narrowly defines socioacusis as "the hearing loss produced by exposure to nonoccupational noise such as small arms fire in hunting and target practice".

There you have it. See how simple it is when you know a bit of Greek. Now you can truly say, "It's all Greek to me!"

P.S. If you know of any other terms ending in -acusis, let me know and I'll add them to this list.

All definitions came from Stedman's Medical Dictionary.

The permanent link for this article is on the Center's website at <http://hearinglosshelp.com/blog/hypoacusis-and-other-words-ending-in-acusis/> (or <http://hearinglosshelp.com/?p=4829> if the preceding link is broken).

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Converting Decibels to Sound Intensities

by Neil Bauman, Ph.D.

A person asked,

How do you calculate the difference in sound intensity in decibels between any two sound intensities. For example, how do you calculate the increase in sound intensity between 0 dB and 15 dB or between 52 and 94 dB?

There is a mathematical relationship between decibels (dB) and sound intensities. It works like this. Each 10 dB increase results in a 10-FOLD increase in sound INTENSITY which we PERCEIVE as a 2-FOLD

increase in sound VOLUME.

Thus, from 0 dB to 10 dB there is a 10-fold increase in sound intensity, just as there is from 10 dB to 20 dB or from 34 dB to 44 dB.

Note: Sound INTENSITY is the ENERGY (power) needed to produce a given level of sound. Don't confuse sound intensity (the amount of energy needed to produce a given level of sound) with sound VOLUME (the level at which we PERCEIVE the resulting sound.)

The table below shows the increase in sound intensity between 0 dB and each of the values listed.

Decibel Value	Increase in Sound Intensity	Perceived Increase in Volume
0 dB		
10 dB	10 times the sound intensity	2 times as loud
20 dB	100 (10 x 10)	4 (2 x 2)
30 dB	1,000 (10 x 10 x 10) etc.	8 (2 x 2 x 2) etc.
40 dB	10,000	16
50 dB	100,000	32
60 dB	1,000,000	64
70 dB	10,000,000	128
80 dB	100,000,000	256
90 dB	1,000,000,000	512
100 dB	10,000,000,000	1024
110 dB	100,000,000,000	2048
120 dB	1,000,000,000,000	4096

As you can see, these numbers quickly get large. For example, if you had a 120 dB loss at a certain frequency, in order to hear a sound at that frequency, it would have to be 1 trillion times as intense (it would require 1 trillion times the energy to produce it) as needed for a person who had "perfect" hearing (and thus could hear it at an intensity of 0 dB).

Note this well. Since our ears PERCEIVE sound logarithmically, we do not perceive a sound of 120 dB as being 1 trillion times louder than a sound of 0 dB. Rather, we perceive it as about 4,000 times louder.

Now that we have a little background, we are ready to proceed with the details of how to calculate the differences in sound intensities and relate them to decibel values.

Unfortunately, far too often people assume that there is a simple linear interpolation between any two decibel values. Thus, since there

is a 10-fold increase between 10 dB and 20 dB in sound intensity, they assume the increase at the half-way point (15 dB in this case) is a 5-fold increase.

If you assumed this, you would be wrong. Even hearing health care professionals that should know don't always get this right.

The reason you can't just simply interpolate between two decibel values is because we are not working with linear numbers, but with logarithmic numbers. This means there is a logarithmic relationship between such values, not a linear relationship.

The formula for calculating the increase in sound intensity between two decibel values is:

$$\text{x-fold increase in sound intensity} = 10^{\frac{\text{ending dB value} - \text{starting dB value}}{10}}$$

Therefore, to find the increase in sound intensity between 10 dB and 15 dB, you simply subtract the higher dB value from the lower value and divide the result by 10 to get the exponent. Calculating $(15 - 10)/10$ gives you an exponent of 0.5. Raising 10 to the 0.5 power gives 3.162. Thus, the intensity increase between 10 dB and 15 dB is 3.162-fold.

In like manner, to calculate the difference in sound intensity between 52 dB and 94 dB, just follow the same procedure and use the same formula. $(94-52)/10$ gives an exponent of 4.2. 10 to the 4.2 power = 15,848.9. Thus, the intensity increase between 52 dB and 94 dB is 15,848.9-fold. To put it another way, it takes 15,848.9 times as much energy to produce a sound of 94 dB than to produce a sound of 52 dB.

It's easy to check your work to be sure you are in the right ballpark. You know the difference you are working with is 42 dB. You already know that for a 40 dB increase, the intensity value is 10,000 times higher ($10 \times 10 \times 10 \times 10$) and that for a 50 dB increase, the value would be 100,000 times higher ($10 \times 10 \times 10 \times 10 \times 10$). (See above table.) So your answer must lie somewhere between these two values, and sure enough, it does.

To make things simple, in case you don't have a fancy calculator*, here is a table to help you.

dB Difference	x-fold Multiplier
1	1.259
2	1.584
3	1.995

4	2.512
5	3.162
6	3.981
7	5.011
8	6.309
9	7.943
10	10.000

In order to use this table, just take the multiplier figures for values between 1 and 10 and then move the decimal point to the right one place for each whole 10 dB difference.

Thus, if you want to find the difference in sound intensity between 3 dB and 9 dB, and since the value is less than 10 dB, just read off the value from the table for a 6 dB difference, namely 3.981. Thus for a 6 dB increase, there is a 3.981-fold increase in intensity.

If you want to find the sound intensity increase between 52 and 94 dB, you subtract 52 from the 94 to get 42 dB. Take the units figure (2) and from the table for a 2 dB difference, you see the multiplier is 1.584. Now to get your final answer, move the decimal to the right by the value of the tens figure (4) and you have a 15,840-fold increase in intensity. (If the decibel difference is larger than 100, then use the tens and hundreds figures. Thus if the difference was 124 dB, you'd move the decimal to the right by 12 decimal places.) That's how simple it is.

And if you ever want to calculate how much louder you PERCEIVE one sound as compared to another you can do it by using the following formula.

perceived x-fold volume increase = 2 to the (ending dB value – starting dB value)/10 power

Therefore, to find the perceived increase in sound volume between 10 dB and 15 dB, you simply subtract the higher dB value from the lower value and divide the result by 10 to get the exponent— $(15 - 10)/10$ gives you an exponent of 0.5. (So far, everything is the same as for calculating intensity differences. Now comes the change—you use base 2 rather than base 10.) Raising 2 to the 0.5 power gives 1.4. Thus you would perceive the sound as being 1.4 times louder.

In like manner, to calculate the difference in perceived sound volume between 52 dB and 94 dB, just follow the same procedure and use the formula. $(94-52)/10$ gives an exponent of 4.2. 2 to the 4.2 power = 18.4 times louder.

Note: Perceived volume varies from person to person so the calculated

results may not agree with any given person's subjective results, but it certainly puts you in the right ball park.

* Note: if you have an iPhone, you have a fancy built-in calculator. Swipe up from the bottom and you'll see it there with your flashlight, timer and camera. When you hold your iPhone vertically you have a simple calculator. Turn your phone on its side and it automatically switches to a fancy scientific calculator where you have the 10 to the x power and the x to the y power functions.

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4. Information on Hearing Aids, Cochlear Implants and/or Assistive Devices
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Why Don't My New Hearing Aids Let Me Understand Speech Perfectly?

by Neil Bauman, Ph.D.

A man wrote,

I am disappointed with my ability to understand speech with my new hearing aids. My hearing aid dispenser gave me the word recognition test. I scored only 50 – 60% which I don't think is much of an improvement over my old aids.

Naturally, you always want your new hearing aids to help you hear even better than your old hearing aids did. At the same time, you need to have realistic expectations regarding what your new hearing aids can and cannot do in helping you to hear better.

Hearing aids typically perform three main tasks.

1. They make sounds louder.
2. They filter out some background sounds so it is easier to pick out speech from background noise.
3. They compress sounds so they better fit your dynamic range. This means they make the soft parts of speech louder while at the same time, they keep the loud parts from becoming too loud and hurting.

When you have less than perfect discrimination, such as you have, you cannot understand everything people say. You may hear the sounds with the help of your hearing aids, but your ears/brain can't always figure out what the word was. Sometimes you hear gibberish, or what sounds like a different word from what was said.

When you get new hearing aids, you hope your discrimination scores will be higher than they were with your old hearing aids. But that is not a given. At the very least, your new hearing aids should give you the same level of understanding as did your old hearing aids.

If they don't, you can assume that your audiologist/dispenser has not programmed them properly for your hearing. This happens much more often than you might suspect.

One way this can happen is if you need speech compression so the louder parts of words don't become too loud while still amplifying the softer parts so you can understand what people are saying. Unfortunately, compression distorts speech to some degree and this can mean you don't understand as well as you should.

This happened to me with one set of hearing aids. I needed a fair bit of compression so the louder parts of speech wouldn't recruit and

hurt. At the same time I needed the softer parts of speech amplified so I could hear them.

When the compression was set so that louder parts of speech didn't hurt, my speech discrimination went down because of the additional distortion. In like manner, when the volume was set softer so sounds wouldn't recruit I didn't need as much compression, but the sound level was now too soft for me to hear speech well, so again, my speech discrimination went down. Thus there was a fine line I had to tread—find the balance between compression and volume. Either way, I had trouble with understanding speech.

For those hearing aids, the best compromise resulted in a 12% reduction in my speech discrimination. Not a win-win situation to be sure, but still better than not wearing hearing aids at all. Thus, no matter which way I had them adjusted, I still needed to do a lot of speechreading to completely understand what people said.

Another reason for not having better discrimination with your new hearing aids is that your hearing aids were not set to fit your hearing prescription. Your hearing prescription is the amount of gain you need by frequency in order to bring your hearing up to where you hear and understand best.

The hearing aid manufacturer's software selects your prescription based on the results of your hearing tests. It then programs your new hearing aids with this prescription.

What typically happens next is that your audiologist/hearing aid dispenser sends you on your merry way, assuming you are hearing wonderfully well with your new aids. After all, they programmed your hearing aids according to the hearing prescription you need.

This begs the question, "Why are so many people disappointed with their new hearing aids"?

The answer is because your audiologist/dispenser did not check and verify that the hearing prescription you need is what your hearing aids are actually sending down your ear canals to your eardrums. You see, because of a number of factors such as the length, size and shape of your ear canals, what you need and what your hearing aids send down your ear canals are two different things and that makes all the difference.

The only way your audiologist/dispenser can verify that your hearing aids are meeting your hearing prescription is by inserting tiny probe microphones way down your ear canals to "listen" to what your hearing aids are sending down them. This is called real ear testing.

Real ear testing really does make a difference in how satisfied you will be with your new hearing aids. It's that important. In fact, it is so important that it is one of the "best practices" listed for fitting hearing aids. Even so, less than half of audiologists and hearing aid dispensers actually take the time to do it.

Thus, if you are not satisfied with your new hearing aids, go back and find out if your dispenser did real ear testing or not. If he didn't, insist that he does. If she doesn't have the real ear testing equipment, then ask for your money back and go to an audiologist or hearing aid dispenser that regularly does real ear testing. This will give you the best chance of understanding the best you can with your new hearing aids.

Having said that, you have to be realistic about what your hearing aids can do to fix your lack of discrimination. No matter how good your new hearing aids are, and in spite of proper real ear testing, you'll NEVER hear better than how well your damaged auditory system can process speech. Thus, if your unaided speech discrimination is 50%, don't expect your new hearing aids to give you 100% discrimination. It just doesn't work that way. That would take a miracle! Let me explain.

I'm using a visual analogy to help you understand why this is so. Pretend you are looking through a window into another room. Your side of the window is the "hearing aid" side and the other side is your "brain and auditory processing" side. In this analogy, the window is very dirty on BOTH sides so you cannot clearly see (hear) what is on the other side. You and your audiologist/dispenser only have access to your side of the window, so you do what you can. You clean and polish the glass on your side until it is spotless (adjust your hearing aids properly, verify with real ear measurements, etc., etc.). That lets you see (hear and understand) a bit better.

At this point, you have done all you can do, but because the other side of the glass is still very dirty (50% discrimination), you still can't clearly see (hear) what is in the other room. And since the other side of the glass is in your brain, there is nothing anyone can do about cleaning it either. THAT is why your new, properly-adjusted hearing aids don't permit you to see (hear) clearly like you want to. This is just the way it is.

Therefore, you have to have realistic expectations. You need to do everything you can to keep your side of the window clean. The rest is beyond your control. Instead, use your other senses to help fill in what you are missing. For example, use speechreading, writing things down and other visible ways of communicating to help make up for the

“dirty window”. You’ll be surprised how well you can do, when you do this.

One final word of advice. Don’t fret about those things that are beyond your control. It will just make you miserable. Instead, rejoice that your new hearing aids help you as much as they do.

Zinc-Air Batteries Need Time to Get Ready to Work

by Neil Bauman, Ph.D.

A nurse wrote,

I am a nurse at a retirement home and was told by the daughter of one of my residents that her hearing aid batteries must be left out in the air for a few minutes after the tabs are removed before placing them in her hearing aids. Is this true?

Strange as it may seem, yes, this is true. Let me explain.

Many hearing aids currently use zinc-air batteries. These batteries all have colored tabs on them that indicate their size. The reason zinc-air batteries have tabs on them is to cover the one to nine tiny air holes in the battery to keep the air out until they are ready to be used. This gives these batteries a long shelf life.

When you want to “wake up” (activate) one of these zinc-air batteries, you simply remove the tab that covers the air holes. This lets air in to start the battery “working”. It takes the battery a couple of minutes to “wake up” and get up to full working voltage. That is why you should pull the tab off, then leave the battery with the air-hole side up so it can “wake up” and “get ready for work”.

If you don’t do this, two bad things happen.

First, because the voltage is so low right after you pull the tab off, the hearing aid may not even boot up. If it does boot up, the hearing aid may “beep” or say the battery is bad and needs replacing when this is not true. It just needs a bit more time to get up to full voltage.

Unfortunately, some people quickly throw the battery away and put another one in without giving it time to fully “wake up”. And when

that one appears to be bad, they throw it away too, and try yet another one. Then they assume they had a bad package of batteries. All they needed to do was give the battery time to "wake up" and "get ready for work".

Second, removing the tab and putting the battery in the hearing aid without giving the battery time to get up to full voltage shortens the battery's life. Therefore, it is time well spent waiting two minutes or so and letting the battery get up to full voltage.

Note: one thing you might not think about is that once you remove the tab, the battery is activated. At this point, the battery starts working and it continues to work whether you use it or not. After two or three weeks the battery will be run down, even if you never used it at all. Therefore, do not remove the tab until you are ready to use the battery.

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TENS Treatment and Cochlear Implants

by Neil Bauman, Ph.D.

A lady asked,

I have lower back pain from degenerative disk disease. I'm wondering if I can use a TENS unit on my back now that I have a cochlear implant?

If you are not familiar with TENS, TENS is not what comes after NINES and before ELEVENS! Rather it is an acronym that stands for "Transcutaneous Electrical Nerve Stimulation".

Typically, TENS is used to help treat chronic pain. TENS units pass an electrical current through your skin (that's what transcutaneous means) via two (or more) electrode pads taped to your skin near where the pain signals originate in order to stimulate the underlying nerves using electrical impulses.

The idea is that:

The body is capable of producing natural painkillers called endorphins and encephalins. It is thought that the impulses

produced by the TENS machine help your body to produce these painkillers and so reduce pain.

The electrical impulses that are produced by the machine travel along the same nerve pathway as your pain. These impulses interfere with the pain message getting to the brain and override the pain sensation. (1)

Now, what does this have to do with cochlear implants (CIs)? Good question.

If you use a TENS unit too close to your cochlear implant, the current from the TENS unit can alter "the frequency of cochlear implants requiring them to be re-tuned". (1) In other words, it can wipe out your cochlear implant's maps. When this happens, you will need to have your cochlear implant reprogrammed. Until you do that, your cochlear implant won't work and you'll be left deaf.

Thus, when it comes to electrical equipment, it's always better to be safe than sorry. So let's look more deeply into this issue.

The cochlear implant manufacturers are well aware of TENS units and determine how close a TENS unit can be and yet not cause problems with the cochlear implant. Then they add additional distance for an extra margin of safety.

For example, the card that comes with CIs from Cochlear Ltd says not to use a TENS unit on the head or neck.

More specifically, according to otologist Dr. Thomas Haberkamp of the Cleveland Clinic Foundation, "TENS can be used but needs to be 20 cm from the implant: basically any treatment like that needs to be below the shoulder with any grounding below the shoulder."

If you don't know your metric conversions, 20 cm is 7.8 inches. Thus, just be sure that you keep any TENS electrodes at least 8" from your implant, and you will be ok. Note: both (all) electrodes need to be more than 8 inches from your implant, not just the "hot" one.

Since the 8" distance figure is already allowing for plenty of extra distance for safety, basically you can use TENS on your ba...

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