



Understanding medical care in performing arts medicine

Valerie Trollinger, DME

Professor, Dept of Otolaryngology-Head & Neck Surgery, PhillyENT Associates

Drexel University College of Medicine, Philadelphia, PA

We Are Instrumentalists Who Are Also:

Small-Muscle Athletes.

Like sports athletes, we are prone to injuries that can impede our ability to perform.

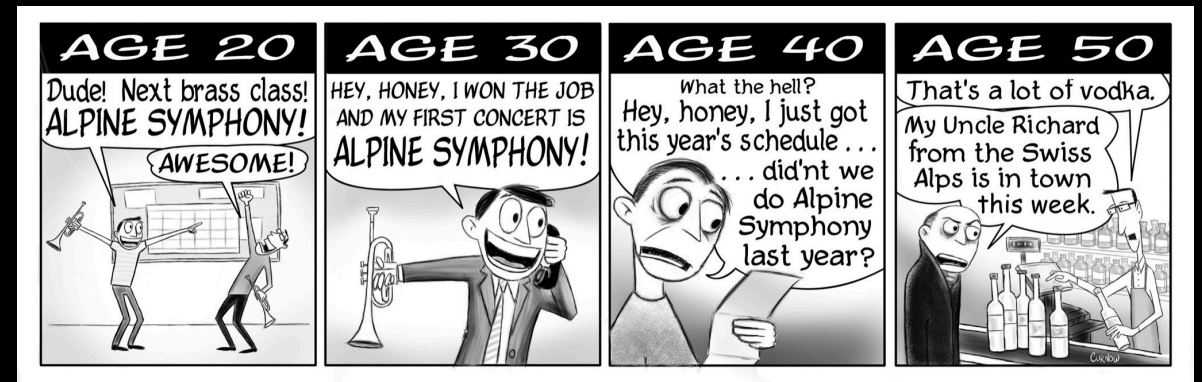
Unlike sports athletes, we are taught to ignore injuries, view injuries as weakness, and simply to be afraid or ignore injuries.

The medical field of Performing Arts Medicine seeks to remediate these concerns, help musicians see injury is not a weakness, and help them get care.



The professional musician as patient (told to MD's)

- The fears of a compromised career are stronger.
- While most of our cultures believe that being engaged in music-making is therapeutic, in the professional performance world musicians are under extreme pressure to be perfect all the time and create flawless performances. When we are young, we don't realize this, however, over the years it will significantly affect older professional musicians. Therefore, there will be increased anxiety with us.



Defining "Injuries"



- Physical – from overuse or other activities
 - Muskuloskeletal
 - Torn ligaments and tendons, primarily: also arthritis from overuse. Mostly in the hands and arms.
 - Larger muscle aches and pains
 - Arthritis.
 - Neurological (Central and peripheral)
 - Dystonias
 - Concussions (esp. Conducting with them)
 - Effects of strokes
 - Degenerative nerve disorders
 - Auditory
 - Hearing loss
 - Vocal and Vocal Tract and Oral problems (for us this affects wind instrumentalists who are prone to injuries).
- Emotional
 - Performance Anxiety and General Anxiety- not addressed in this lecture today.

Critical points:



- **While our injuries can be very small, and in non-musicians would not notice a diminishment of being able to do their job, for musicians the small injuries can have career-ending implications, for example:**
 - A wind instrumentalist with LPR, cyst, and VF paresis and nerve damage suffers a significant loss of stamina in being able to play.
 - A pianist has his hand accidentally slammed in a cathedral door in France while on tour, thus ending his career as a concert pianist.
 - A wind instrumentalist suffers an unusual intubation injury in that she has bitten her tongue seriously while under anesthesia and as a consequence, is unable to play professionally for a period of time.
 - A sax player develops vocal dystonia from being required to play with vocally damaging extended techniques and as a result is no longer able to play.
 - A young trumpet player experiences the phenomenon that his larynx turns when playing the trumpet, making it difficult for him to play.





Critical Points continued...

- Each of us is put together similarly yet differently. When we see patients internally (via surgery) even though we share the same physical architecture, there can be subtle differences that can result in problems in one person but not in another.
- This affects diagnosing any injuries or combinations of other physical health issues with the individual (if they exist) who is a musician. This is one reason why many musicians have been frustrated over care that they try to get.
- Insurance – is also another critical point. Not everyone has access to the insurance to get to the level of care one may need to take care of a problem.
- Problems tend to snowball if they are ignored.



What are our major beliefs that may keep us from seeking care?

- Hearing loss is always noise-induced from playing in a large ensemble or rock/pop band/orchestra.
- Any hearing loss will affect our ability to play or sing in tune.
- Nodes are the worst possible vocal problem.
- Pain from overuse (practicing, long rehearsals, etc) is to be expected, ignored, and played through. It will make us stronger.
- Admitting or complaining that we have any pain or an injury is a weakness, and will cost us jobs and contracts.
- If we have an injury that means we didn't take care of ourselves. It is not a badge of honor.
- That physicians don't understand what our jobs require and don't know how to treat our injuries, so we see one once and often don't return.

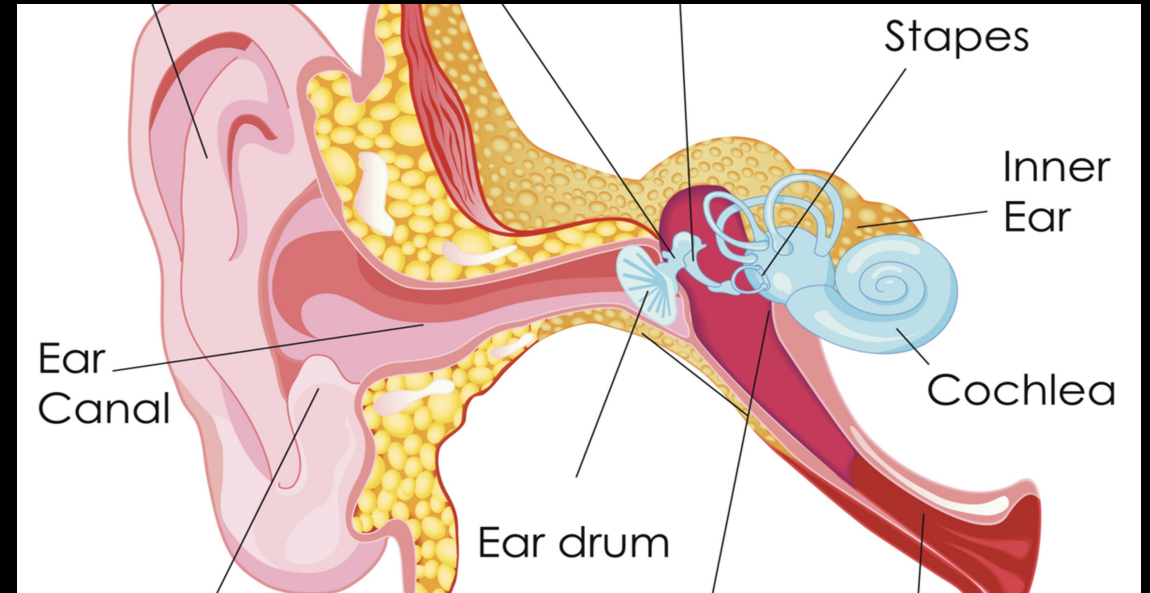


Empowering yourself to seek **CORRECT** Care:

- Musicians need to better understand overall how the body works in making music.
- Musicians need to know what they should be asking at physician visits and the tests and care they should expect.
- Nearly all of our injuries are **NOT** career ending. Injuries that are combined with physical disorders can, however, make things worse.
- Hearing Loss will not end your career... but.....
- Finding a physician who has the correct training. Many do **NOT**.
- Surgery is **ALWAYS** the last option for our injuries.
- Never be afraid to ask for help. Our injuries do not make us weaker, they make us stronger. We **ARE** the small muscle Athletes!

How we hear

- We have two main processes: Conductive hearing, and sensori-neural hearing.
- Conductive – the physical act of the sound being perceived by the auditory canal up to and including the tympanic membrane (which is nothing like a tympani) and the ossicular chain (smallest bones in the body) to the Cochlea.
- Sensori-neural: the conversion of the pressure waves into electrical energy through transduction that is transmitted via the auditory nerve to the brain, where it is translated into sound.





** What is ear wax?

- Cerumen is the clinical term.
- It protects your ear, it has to be there.
- Some people have an excessive amount which needs to be removed, others really go at it with a Q-tip.
- When we look in your ears, we can tell what you have been doing, esp. with Q-tips – since often the cerumen is pushed up against the ear drum and often has started to harden.
- I have noticed with my own students who use earbuds that they have a ring of cerumen close to the entrance of their ear.
- It is supposed to work its way out. If you have normal cerumen production, let it be.




Hearing tests....

- The baseline test we all take is from about 250 HZ (close to middle C) up to about 8000 hz (twice as high as the last key on a piano).
- Your hearing test can be different each time depending upon what you are doing – eg, after a concert vs after a week of total silence.
- You can have sensorineural hearing loss but still have normal conductive hearing exams.
- Audiologists (D.Au) can conduct some other tests to see if there is more hearing loss other than conductive, but they still have a limited arsenal of toys to use. They can tell you that you have a loss, but not why. They are not physicians.
- Otologists are physicians who specialize in hearing and generally have all the toys and equipment to do more evaluations, plus they can order the blood tests to check for autoimmune or genetic issues, and also can order imaging studies (MRI,CT) . They can tell you not only what the loss is , but also why you have it and if it can be remediated.



An additional warning:

- With the newer availability of hearing aids, this has caused major concern in the Otology community for the following reasons:
 - A D.Au has 7 years of training. However, the corner stores or clinics opening to provide hearing aids are the issue in that anyone can have a two-week training course to open one of these stores and as such push hearing aids.
 - Musicians should be seeing Otologists, as they are the best equipped to investigate and care for us. D.Au 's are OK for starting out an evaluation, but there are still some problems with their understanding of our needs.
 - Hearing aids are an industry , and it is well-known that some of these places can artificially have test results that show you have hearing loss, when actuallyyou don't have it.



How do conductive and sensorineural hearing loss happen?

- Conductive - (this is the mechanical side) aging of the ossicles is usually what starts the loss, and one can actually have tympanosclerosis of the tympanic membrane (it gets too stiff to move). This is easily repaired via outpatient surgery to replace the membrane. Additionally, a stapedectomy can be done, if the problems are with the bones. Again, this is a common procedure.
- Sensorineural loss – a more common type is usually a result of aging in that the membrane inside the cochlea the vibrates and transduces the pressure waves into electrical information essentially have the cilia on them degrade through use, basically they can be burned off (friction). The cilia don't grow back. It commonly happens in the highest frequencies first.
- However – many other factors can contribute to both of these areas losing hearing acuity.



Hearing Loss: Facts

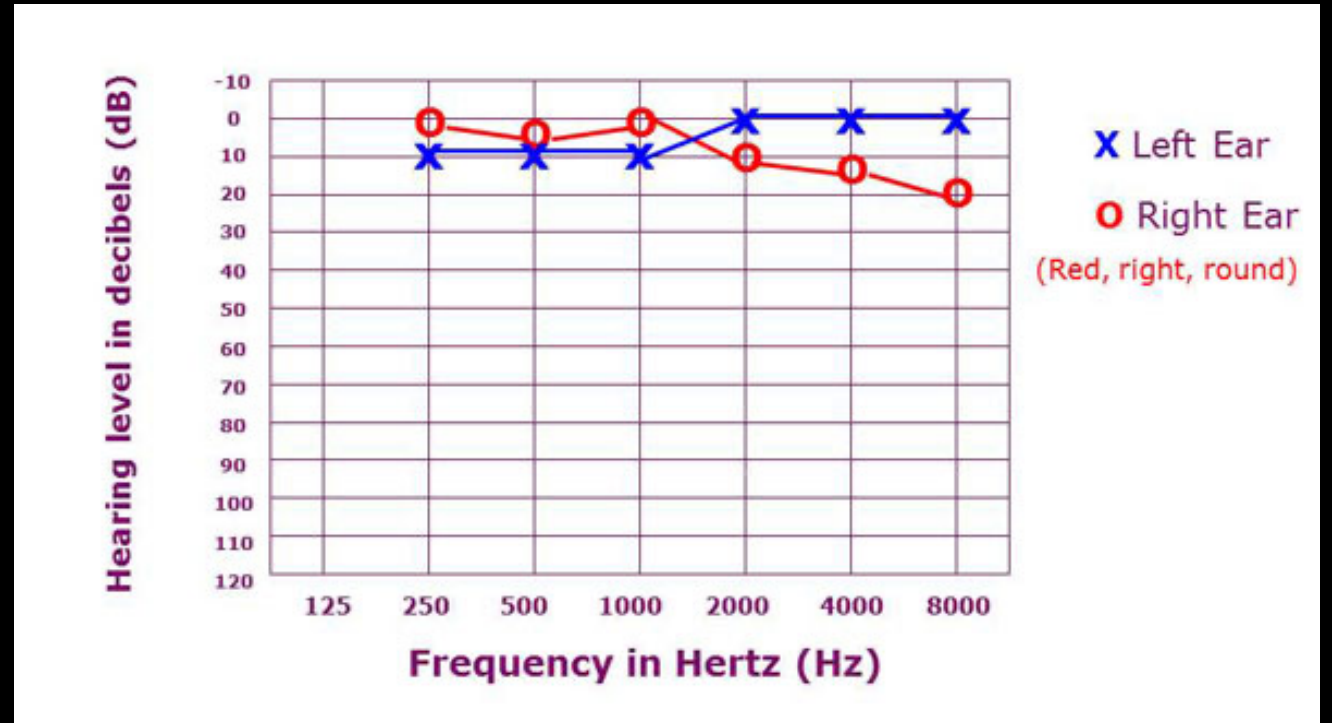
- There is no research showing that playing in an orchestra by itself will CAUSE significant hearing loss. It can exacerbate it, however. There is plenty of evidence that a decrease in hearing acuity that can be attributed to playing in a large ensemble if there are other physical problems (e.g., high blood pressure, lyme disease, and many other neurodegenerative issues).
- Human hearing range is 20-20,000Hz. Our most accurate hearing range is 500-2000 Hz (basically C5 up two octaves.). Our MUSIC hearing range is 27.5 - 4200 Hz (essentially the range of the piano).
- Hearing loss often starts showing in the 6000-8000Hz Range, which is where consonants live. Common Hearing loss can also be attributed to the following common reasons:
 - Aging- Presbycusis
 - Autoimmune inner ear disease
 - Physiological uniqueness(e.g., birth effects)

What the audiogram shows

Normal-

Notice that the 250-2000Hz range reflects the lower energy (db, loudness) but the higher frequencies show we need more energy to perceive these frequencies. This is normal.

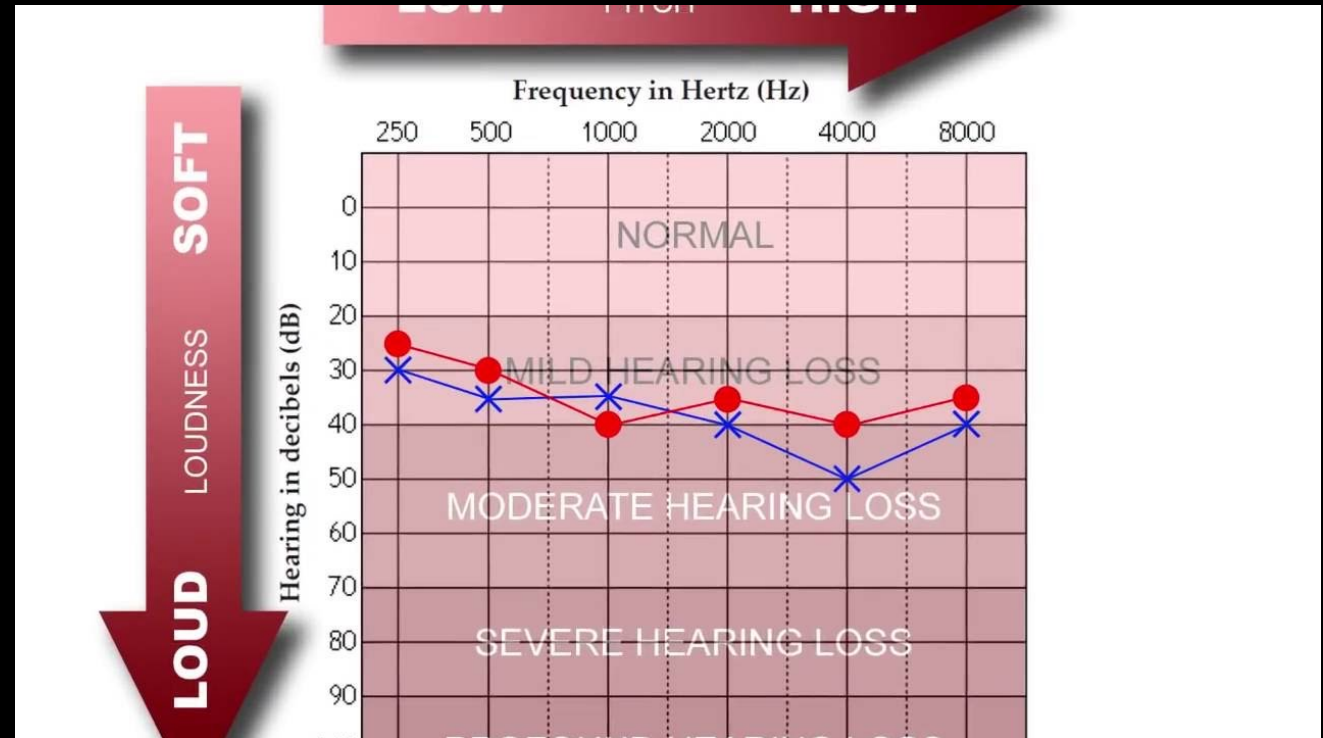
20 db lines do not indicate hearing loss, these are normal.



Abnormal Tests

When they show large differences between ears.

When the lower frequencies show db loss of MORE than 20 DB, and the higher ones also show a large decline that goes below the 20 Db line.



Noise-Induced Hearing Loss

Seems to show its presence around the 4000Hz to 6000Hz levels, indicated by a "notch" in an audiogram. The graphic at the right shows it happening in the 6000Hz range.

This is due to a narrow turn in the cochlea with little space for the basilar membrane to vibrate so that will be the first place a problem could show up. If you see this in your audiogram, then you know.

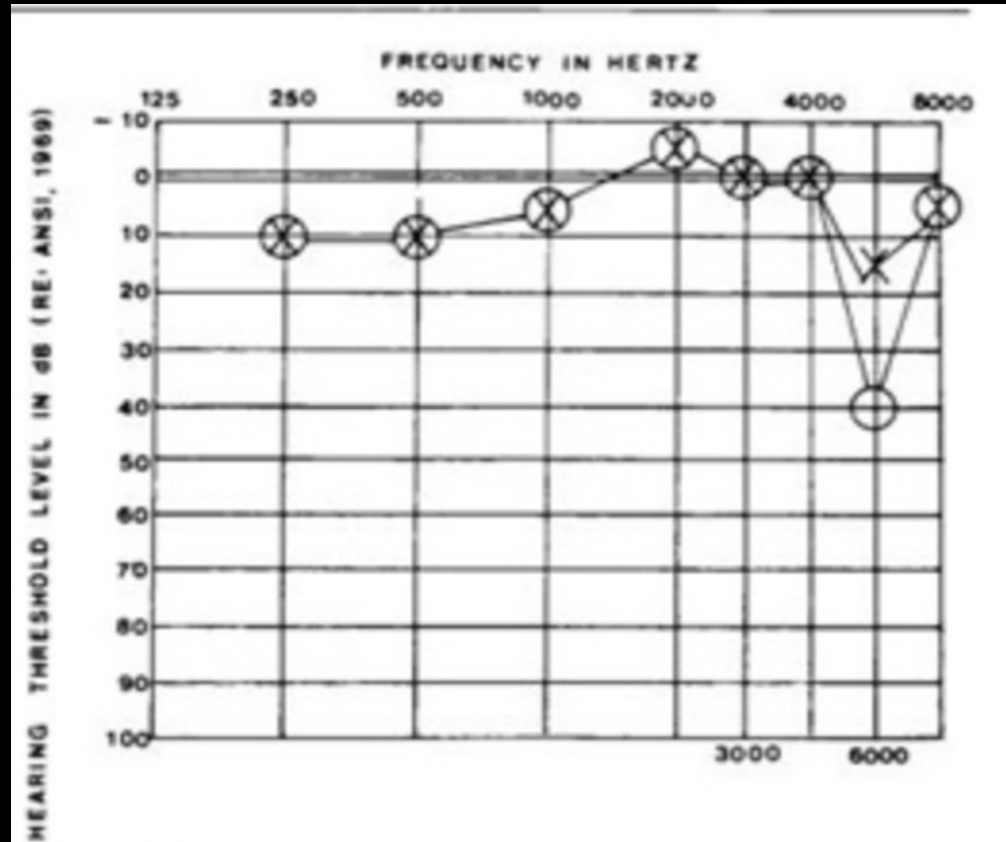


Figure 1. A sample audiogram from the hearing loss only at 6000 group.



Hearing Loss Implications

- Hearing aids are designed to amplify the 6000-8000 and higher Hz frequencies, and that is all. They do not work with listening to music (the range is different). That is why playing with hearing aids in the ears does not work and actually feels weird.
- Hearing loss that happens in BOTH ears as a part of aging and interacting in an orchestra is not career-ending. Again, different listening range. BUT--
- Hearing loss has been statistically significantly correlated with the development of DEMENTIA. This is one of the few causal-correlation relationships that is very strong. A major study in the Lancet published on July 23 2023 has found that hearing aids can cut the chances of developing dementia up to 50% (presence of comorbidities or other health problems can change that).
- Hearing loss in ONE ear, however, or significant drops while still young indicate something else is likely happening ---BUT---



Musicians....

- Especially violinists and violists, have consistently shown a hearing loss in the left ear, because the instrument is right under the jaw.
- Female musicians overall tend to have less loss than males.
- There seems to also be more loss – for those who have it --in Left Ears overall for all musicians.
- The researchers have not really delineated and compared carefully the differences between practicing in a practice room and on a stage, however it has been shown clearly that the facility in which we are playing and the set-up of the stage can affect how much we are subjected to.



Other issues to understand -

- Autoimmune – four genetic markers, to be tested, one needs to give a lot of blood. Treatment: monitor and steroids. There are professional orchestral musicians with this problem, and they still play.
- High Blood pressure, Lyme disease, and about 48 other disorders – all can contribute. COVID messed significantly with the nervous system and has affected the laryngeal area and the ears , but the ears are still under research.
- One ear Loss that is significant- you need to get to an Otologist, NOT an audiologist. Otologists are physicians and often will have more diagnostic tools available.
- Ruptured Ear –drum or bleeding ear-drum: this often heals up on its own.
- Sore throat and sore ear? It is more likely not an ear infection than it is a Eustacean tube dysfunction or blockage. Usually decongestants help, but if not, see an otologist (because they will also check Eustachian tubes). Treating these is easy. Recurring ear infections can lead to bigger problems.

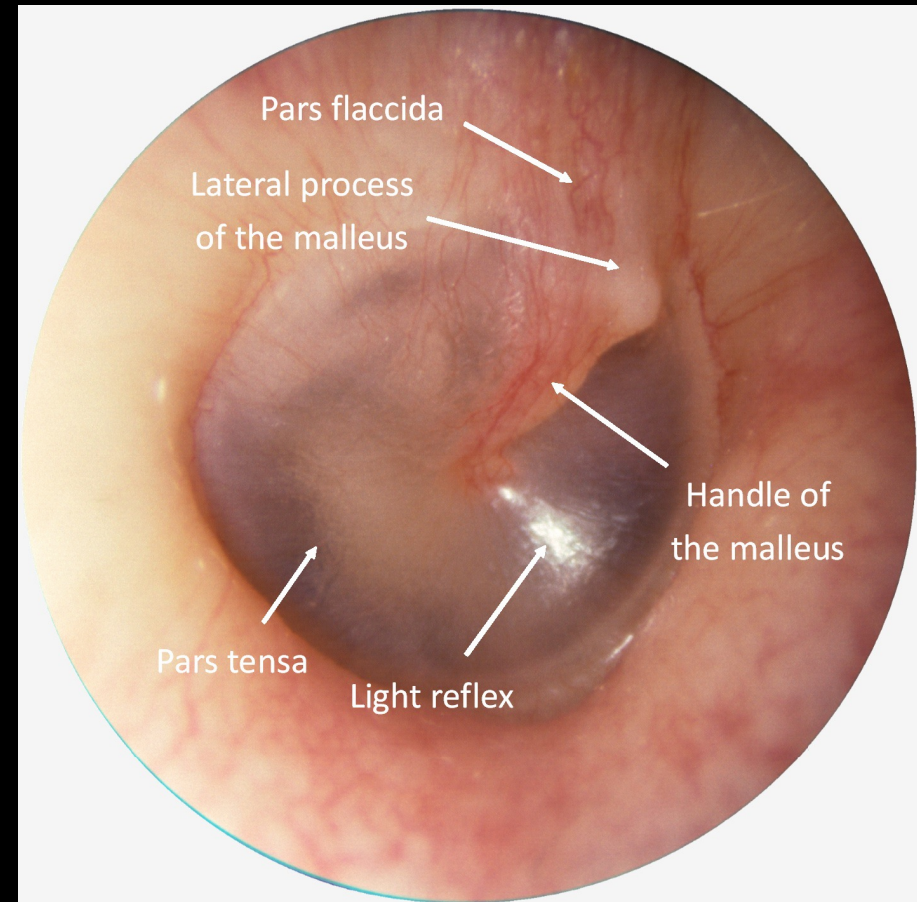


Main takeaways -

- Hearing loss will not end your career as a musician.
- But, still protect your hearing (we have all been lectured about that extensively) and monitor it regularly.
- As soon as it is noticed that presbycusis is affecting you and it may be significant, swallow the pride and wear the hearing aids when you are NOT playing or listening to music. This goes for everyone, even non-orchestral people.
- Since you are musicians, see otologists, NOT audiologists. There are a few otologists who specialize in musicians, but other than one, I don't know who the others are although we try to find them.

** Looking in your own ears....

- You can easily look in your own ears and also learn how to look in other ears –
- Otoscopes are available on Amazon. With them come directions on how to use them and often pictures of what a normal ear looks like, an infected ear, a perforation, and etc. These are geared for mothers, primarily.
- Another more sophisticated option is the BeBird- which connects to your phone and you can see in YOUR ear as well. It has multiple uses.
- I have taught my grad students how to do this, it is not hard. But, every ear canal is different so you have to move around to find the right angle, it isn't straight in all the time.





Wind Player Specific Problems

- This is a very new area of research and treatment.
- Wind players are exactly the same as professional singers in that the throat and voice mechanisms are used extensively when making sounds.
- Damage that we have already documented in wind players:
 - Significant acid reflux – silent is the most common
 - Vocal fold paresis and specifically laryngeal nerve damage to one of the nerves that controls breath control through an instrument.
 - Dysphonia and voice loss- some new extended techniques, like making voice sounds while playing an instrument have contributed to more problems with this.
 - Vision problems (oboes) strokes (trumpets).
 - Velopharyngeal Insufficiency (VPI)



Throat issues....

- And the subsequent problems all come from **tension** in the laryngeal area. There is a myth that the throat is "open" when playing. But, endoscopic exams have shown overwhelmingly that everyone is different. Some players have wide open vocal folds, while others play with their vocal folds touching (and don't feel that) and others have peculiar behaviors, such as posturing.
- The notion that vocal folds cause vibrato is also incorrect. They may help mediate airflow, but they do not cause it. They have no ability to move on their own to do so, so it is more likely that any vocal fold movement you see (this is the white part) is simply responding to the air flow. If you do feel movement in your throat while playing with vibrato that primarily your TA muscles engaging.
- But say you are a wind player with a throat problem....



If you think you have LPR/GERD- not caused by tension

- You can try some changes to see if they make a difference – they won't cure it, but they will help you find out before you see a specialist:
 - Sleep on an angled mattress (body length foam on top of mattress that puts you at an angle – NOT pillows only)
 - Drink alkaline water
 - Don't eat late – at least three hours before you go to bed
 - Get rid of acidic foods temporarily to see if there is a difference
 - And/or get rid of gluten foods temporarily to see if there is a difference
 - Pay attention to if you have bad breath in the morning or wake up and need to cough up a bunch of crap...
 - You can't cure yourself alone with this – treatment is critical

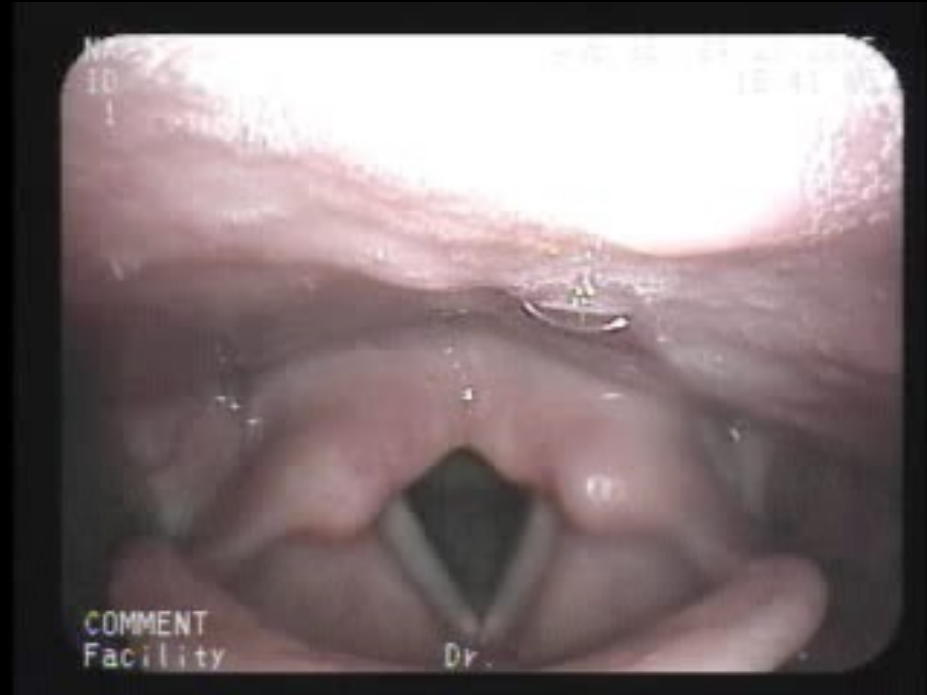


LPR/GERD continued--

- The burns on your vocal folds (from the acid) can heal over time- but uncontrolled reflux only keeps burning them so they get worse, as does everything else in your throat that is burned.
- We can tell what side you sleep on simply because of the burn pattern when you are scoped.
- Once you get it under control with professional care, then moving to a more homeopathic approach may work for you.
- The cause is a faulty valve between your esophagus and stomach that lets the stomach contents come back up. It can be repaired. It was made to last only 30 years.
- Silent reflux is not felt, because the sensors in the esophagus that would "feel" it are burned out, but they also can heal.
- **Uncontrolled LPR has been statistically significantly connected to developing throat cancer.**

This is a comprehensive exam--

- Flexible scope (through the nose) shows how the arytenoid cartilages are moving, which indicates if there is any weakness (one side moves more than the other). Many of the tasks done are done to tire the musculature which will reveal a problem. Sniffing also shows how they are working. Notice that this is a healthy voice. The right side of the video is the left vocal fold, and the left side of the video is the right vocal fold.
- The rigid scope (in the mouth) provides a closer look at the folds themselves, which can be investigated for any injuries.





Wind player care

- You need to see a laryngologist who specializes in professional voice, NOT the corner ENT. Our practice in Philly is the only one that has a wind person on staff to work specifically with wind players, hopefully we will train more.
- The laryngologist should put you through the same paces in an evaluation as a professional singer, which means more than just saying "eee" and that is it. If you ask for a more comprehensive evaluation (two scopes) and don't get it, you need to see someone else.
- You also should be scoped while you are playing your instrument, to see how the vocal mechanism behaves. It may really surprise you , and your laryngologist. It can reveal some other issues.
- If you are diagnosed with any of the following on the next page, this is what to do:



What to expect if you are diagnosed with an issue:

- Vocal fold paresis – depending how bad it is, voice therapy should be able to address it and remediate it. If it is severe, which would require a LEMG to find for sure, and you are a wind player and the PCA especially is affected, let me know and I'll help you with some strategies specific to playing your instrument that will also work with voice therapy.
- LPR and GERD – gastro folks don't care about your throat, they only look at your tummy area. Laryngologists look at the whole picture – because acid does make it into the nose and ears, especially while sleeping. If you have reflux, get yourself on track with it. LPR causes cancer – and also burns your throat tissues.
- Cysts, Nodes, Granulomas --- unless they are on the vibrating margins of your vocal folds, or gigantic (ex, for nodes) surgery should NOT be the first offer. Voice therapy always should be first. If you do need surgery- do voice therapy for at least 6 visits before surgery to ensure you use the voice properly and don't make the same problems come back (like Adele did not do).
- Dysphonia – the catch-all term for a disordered voice. If you loose your voice a lot, or it fatigues when you are teaching, or it even changes after you have playing your instrument for a long time, you should be looked at. Wind players frequently have this problem.



The Warning

- In All areas, there are surgeons who will want to do surgery first. For us, we should not do that for these reasons:
 - a. Therapy is better for us as a first line of remediation, especially with our smaller muscles that we need in music performance.
 - b. Scar tissue is a concern. There is no way to know how you will scar after a procedure, or if your body will be one that will continually put scar upon scar.
 - c. Intubation – intubation injuries do happen. It is common to have your voice compromised for about 10 days after surgery (do not panic) but scarring can happen just from intubation which can lead to stenosis – and then it is a constant parade of every few months having it dilated and then at worse case an emergency tracheotomy. In our practice, we use tubes that are a size 5 which works fine. Anesthesiologists will want to ram the biggest tube they can down your throat. If you **MUST** have any surgery where you will be anesthetized, see if you can get a 5 or 6 tube because you are a "professional voice user"



The Warning, continued...

- Wind players and tongues – you may need to fight for this, but if you must have surgery see if the anesthesiologist will wrap your tongue in gauze if possible. Tongue injuries are rare in surgery, but they do happen, and as a wind player, you may find yourself unable to play for months after surgery because of it.
- If you do not have questions answered or feel you have not been evaluated properly, you need a different physician. Don't hesitate to just walk out if you are not convinced.
- Now, to muskuloskeletal--

Muskuloskeletal

- For us, this area has had the most significant research and treatment protocols developed, thanks to the medical specialists who also happened to play musical instruments.
- The main concerns with us are overuse injuries, and treatment protocols are commonly known for us: rest, anti-inflammatory meds, physical therapy or chiropractor, and heat. For many of us, that will be enough.
- Larger injuries – or significant damage from overuse- requires more careful consideration, e.g. Arthritis in the hands and shoulders, back injuries, and dystonias. Again, comprehensive evaluations are important.
- Most treatments and diagnostic tools come from sports medicine to help us. However, most sports medicine MDs don't know how to handle our little muscles, so that is why finding someone who specializes in hands and also has a musical background will really be helpful (lots of them seem to have played saxophone, I find...).



Normal hand vs bassoon hand





Muskuloskeletal, continued....

- Again, surgery should not be the first option offered.
- If the pain is compromising playing while you are looking for help or treatment, and anti-inflammatory diet can help, but you have to be diligent with it .
- Again, except for dystonias, many of the injuries do not need to be career-ending. They can become career-ending if they are ignored and allowed to compound. When you have an injury in one area, then other areas located to the injury will adapt and often not very well so they end up inflamed. Therapy helps retrain so this does not happen.



Overall Remember:

- **Every. Single. Human. Body. Is. Different.** There can be slight differences among us, that is normal.
- Our instruments were never designed to be ergonomic. We contort ourselves for them, it isn't the other way around.
- Even the most careful player who focuses on wellness can develop an injury. Injuries do not mean bad playing or that we aren't taking care of ourselves. Conversely, there are folks who do everything as wrong as possible (e.g., self –taught bassoonists or oboists) and nothing ever happens to them. It all comes down to how we are built which is very individual.
- This also means that one approach to "healing" may work for one person but no one else , as in the case of all the "I cured my dystonia" videos that are online. Be careful.
- If you have any scans done (CT, MRI) always get physical copies of the exams on a DVD or CD.



Larger systemic problems

- At some point, you or a colleague may be diagnosed with a larger systemic problem that may affect one's career (e.g., Myasthenia Gravis, Multiple Sclerosis, Lupus, and so forth). These are well –beyond the scope of this presentation, but the best that can be said is that the individual affected will need care from multiple professionals to see if a performance career can even continue.
- This also makes for extremely difficult decisions from executive directors and music directors. Unfortunately we are in a career area where our physical health can affect our physical ability to perform on our instruments.



Finding the Right Help

- <https://pama.memberclicks.net/referral-directory>- PAMA has a searchable referral directory.
- <https://voicefoundation.org/> - also has a list of laryngologists who focus on professional voice.
- If you are also searching on your own:
 1. Look for a physician who had a fellowship in the specialized area. This is very important – regular MD's are not trained to deal with us. Fellowship –trained have had specialized training and will likely have better diagnostic tools. Or, if you want to go to the top, go to the physicians connected with providing the fellowships. MD's who have had fellowship training often include where the training was, so if you see the same fellowship coming up that should tell you where you may want to go.
 2. Realize physicians who deal with us are still not plentiful. You may have to travel if your need is significant. You want the diagnosis done and start treatment – to go to lesser facilities will likely mean more will look at treating symptoms rather than finding out the cause.



Questions to ask:

- You will have your own, of course, but if you see a physician for an injury, I suggest you do the following:
 - Ignore WebMD and instead look at Mayo Clinic and other specialty center places to learn about what your symptoms may indicate and what testing is done for a diagnosis. For musculoskeletal injuries that are more nerve-centered, learn what an EMG is and how it is done (and if you have it, bring an ice pack).
 - Ask how the injury will affect your playing – and demonstrate it by playing your instrument in the doctor's office! They should be watching you play. If they don't want to, find another MD. Of course, this does not hold true for piano or harp, for example. It will also depend upon if the MD played the instrument you played.
 - You should have a timeline of recuperation.
 - Medine interactions are also critical.
 - Not a question , but what you should do: keep a very clear record of what you are doing when a problem emerges, and also how the injury responds (is the pain burning? Pulsing? Sharp? Dull?) because those give a lot of clues and help in diagnosis.



Remember...

- Not all physicians are capable or interested in taking care of us, there are many who just make the most common diagnosis they have in their toolkit to start, but those are based on data from the general population NOT musicians.
- Residents – I love them, truly, but they really are the equivalent of student teachers. For ENT and Orthopedics, the residencies are 5 years long. For our Drexel-Lankenau-St Chris ENT residents, they only get 4 months TOTAL in those 5 years in working with people like us. I do not know if the orthopedics residents get any. That is why fellowships are really important after residency is completed – and the physician has been in practice for a bit.
- New trend - always see the PA before the MD. PA's who specialize can be really good, but , if you can see the physician when you make the appointment, that is the way to go. Our needs are important and care can be urgent. There are still physicians who do not use PA's. So when looking at a practice, see if there are too many PA's on the staff.



Continued....

- You should always be able to get your visit "note." It would be either in an online portal OR it is mailed to you. The note should be very comprehensive – be very wary of notes that are very short, may have spelling or grammar errors, and basically read as somewhat dismissive. If you need to see another physician, having the first visit note can be very helpful.
- Also check to make sure you are NOT diagnosed with anything else accidentally – always keep track of your records and make sure errors are fixed. Physicians' offices are usually better at this... but, there have been problems.

And if you or a colleague get stuck...or just need help....

Reach out to me, I can help and am happy to do so!

Oh – and about the conductors with concussions..... get them off the podium :) --- IF you care. And, you should not be playing with one, either.

