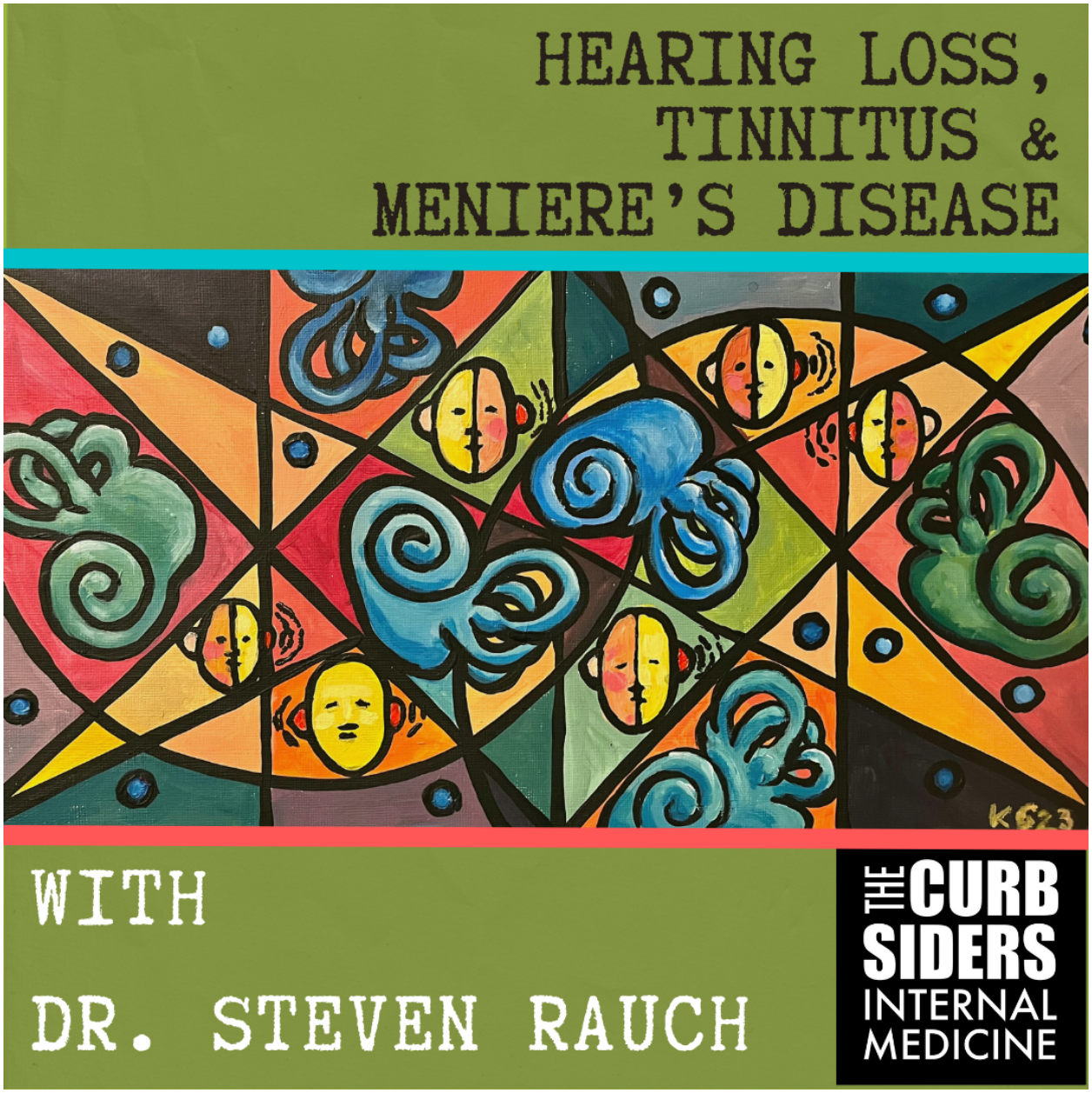
#379 Hearing Loss, Tinnitus, and Meniere's Disease



Matt: You know Paul, I've never seen the inside of my ears.

Paul: [laughs] I feel like there's not even really a question there. What are you hoping to get out of me, Matt? [laughs]

Matt: Paul, but I hear all good things.

[music]

Paul: Great. [laughs]

Matt: No. All right. Thanks to *40bestearpuns.com* for that one. And let's get to the show.

[Disclaimer]

[Curbsiders Theme]

Matt: Welcome back to the Curbsiders. I'm Dr. Matthew Watto here with my great friend, America's primary care doctor and a national treasure, Dr. Paul Nelson Williams. Paul, how are you doing?

Paul: I'm great, Matt, thanks for asking. How are you?

Matt: You look very uncomfortable with that phrase I'm heaping upon you.

Paul: It's not going to stick.

Matt: [chuckles] I think it will. Tonight, we are going to be talking about hearing loss and tinnitus, we're going to talk about how to counsel patients who are experiencing hearing loss and go through some cases, maybe some worst-case scenarios of the patient that walks into our office with hearing loss, Paul. But before we get to that and tell them about our guest, Paul, can you tell them what is it that we do on Curbsiders?

Paul: Happy to, as always, Matt, we are, as a reminder, *the* Internal Medicine Podcast. We use expert interviews to bring your clinical pearls and practice-changing knowledge. We have an amazing expert interview tonight with our guest, Dr. Steven D. Rauch. I will let you, Matthew, tell us all about his amazing accomplishments before we get into the show.

Matt: Sure. Dr. Rauch is a professor and vice chair for clinical research in the Department of Otolaryngology at Harvard Medical School. He is an Otology division member and Vestibular Division chief in the Otolaryngology Department at Massachusetts Eye and Ear in Massachusetts General Hospital in Boston. Dr. Rauch's clinical and research interests are combined in disorders of hearing and balance including Meniere's, autoimmune, inner ear disease, sudden deafness, and migraine. His clinical otology and neurotology practice is in medical management of hearing and balance disorders, which is why we wanted to speak with him. Before we get to the interview, a reminder that this and most episodes are available for CME for all health professionals through VCU Health at *curbsiders.vcuhealth.org*. And now let's get to the interview.

[music]

Paul: So, Steve, we're going to start with our first case. We're going to be talking about Mr. Weber. He is a 73-year-old retired factory worker. He's coming to our primary care office. He says his wife has sent him because he seems distracted and inattentive. He watches the television louder than his family and they're getting frustrated with him when he asked them to repeat what they just said. He says he can't listen to a conversation when there's a whole lot of background noise and he has a hard time joining in conversations on the car journey and struggles in a restaurant kind of any situation where there seems to be a lot of background noise he seems to have to work a little bit harder. He gets annoyed and embarrassed and it's actually is impacting how much he socializes. No prior history of head injury, no history of barotrauma that we can elicit because we're taking a much more thorough history than I typically take.

No ear infection or previous surgeries. He says that he spent some time in the military as a young man and this included detachments in Asia and Africa which required him to take antimalarials and now we're at high-level med student history taking at this point. He tells you that his hearing has gradually become worse in recent years and since the pandemic with everyone wearing masks, this has made things much more difficult as he realizes that he may have been lip reading for a while to compensate and it's just recognizing that now that he doesn't have the opportunity to do so. So, I think before we get into the workup, I think it's often helpful just to hear broadly how you think about the patient who comes to you with what sounds like chronic progressive hearing loss. What big categories do you think about and what's your general approach before we get granular?

Steve: We know that by age 65, at least here in the US by age 65 about one-third of the population has enough hearing loss to wear hearing aids. By age 75, it's about two-thirds of the population is hearing aid eligible. If you just look at their date of birth you can kind of guess whether or not they're going to have hearing loss. The best understanding of age-related loss now is that it's a combination of genetics plus lifetime wear and tear on the ears. The most modifiable health risk being noise exposure. Ototoxic drugs are out there, but they're not the common ones. It's aminoglycosides and as you say, antimalarial or something. For most citizens, ototoxicity is not really the main event. Some chemotherapy drugs, platinum-based drugs particularly can be ototoxic. It's noise and age, which the age being really noise plus genetics. We say age-related hearing loss probably more correctly than old-age hearing loss because the likelihood of you losing hearing over time is a bit like going bald or going gray.

Some people start in their 20s and some people may not ever lose their hair or go gray. And it's a program degenerative process. It varies across the population. But we do know that we see more age-related loss in men than women, probably because they were more likely to be using power tools and playing in garage bands and other stuff. At least the people who are in their 60s, 70s, and 80s now. [Matt laughs] The exposure to loud sound in youth nowadays is pretty equally distributed. Everybody's blasting their ears with loud sound, so I don't know that we're going to see a sex difference.

Anyway, when I see the patient. The story that was in your case is absolutely archetypical. The patients noticed it only gradually. There was a precipitous uptick in people coming to have their ears checked when COVID hit because of the mask depriving them of visual cues and the dependence or the reliance on visual cues is something that all humans do subliminally. It's not something you have to teach people if you want to communicate with somebody who's hearing impaired you have to be face to face in a quiet place.

Medically, I take that kind of a history too, all those things you listed but it doesn't really matter. This person's problem is hearing loss and the cause is a bit irrelevant. What you have to deal with is what's on his plate now.

Matt: For us in primary care, I know we talked a little bit ahead of time. I think the easy answer is just to refer anyone with hearing loss to audiometry which I think at least if you're practicing in the US is fairly available, so that's something that I commonly do. As far as things in a history that might make you refer quicker to see the ENT doctor maybe you can say red flags. Can you point out what are some of those that you might listen for as you're taking the history from the patient?

Steve: Yeah. So, the reddest flag, the only real otologic emergency in this category is sudden hearing loss, which is unilateral, and it's defined as a loss of hearing within 72 hours. Some people wake up deaf on one side, some people feel their hearing dropping like air going out of a tire, "Hiss," over a period of 20, 30 minutes or an hour, they feel the hearing disappearing. Some people feel a click or a pop and the hearing suddenly drops. In about a little less than half of those cases there may be some balance symptoms that accompany the hearing loss, but in the majority of these cases, it's just hearing. Sometimes somebody will get a head cold or an allergy thing or on an airplane flight and both ears block up, but the next day one ear opened and the other one doesn't and the problem with this kind of sudden hearing loss is that it's not scary.

Everybody's had a stuffy ear once in a while and you don't go running to the doctor and so it gets neglected and unfortunately it really is an emergency. There's a short window of time to address it medically or it's too late. Besides that, we worry more about things like ear pain and drainage. If you have blood or pus coming out of the ear that needs prompt attention. If somebody has acute whirling vertigo that's come on rapidly or suddenly, that needs to be evaluated. If it's the first episode it needs to be evaluated for the go, no-go decision about stroke. But if it's relapsing vertigo, it's not an emergency anymore, if it's gradual hearing loss, it's not an emergency. We do have a red-ish flag for somebody who has unilateral progressive hearing loss. And it's not an emergency, but both ears are approximately the same age and both ears [Paul chuckles] have the same life experiences.

If somebody comes in and one ear has been going down over the last number of weeks or months, that's concerning. It's even more concerning if there's an expanding repertoire of neurological stuff that they've lost their hearing, but now they're feeling like their balance is not quite right, their face is twitching, other neuro-flavored symptoms, that's very worrisome and need to be evaluated. It's not a lights and siren emergency. It's just important.

Paul: So, taking it back to Mr. Weber, who's got this fragile non-alarming hearing loss, what exams should we be doing in the primary care office before we sort of send them out for audiometry? I know for me, I'll probably look and see if there's anything blocked up in there. I'll maybe do a finger rub or a whisper test, but above me on that is there-- should we be banging tuning forks around and stick them on the foreheads? [Matt laughs] Or is there anything else fancy that we should be doing to help set everyone up for success?

Steve: Yeah, actually no. I think trying to look in the ear, practicing looking in the ear. If you put your Otoscope speculum in the ear and you're still seeing little hairs blocking your view, you're not in far enough. The speculum should always go in past all the hair, [Matt laughs] and if you can't get in past all the hair, you need to send the patient to somebody else.

[laughter]

If you get past all the hair, hopefully, you can see the eardrum and you know what an eardrum looks like and it kind of looks like wax paper. It's kind of gray and a little shiny. If that's not what you see, either you don't know what you're looking at or there's something wrong with the eardrum, but in either case, they need to go see somebody else. I don't think that there are a lot of branches on the decision tree. I do think that a finger rub is a perfectly acceptable simple hearing test. You can do that on each side, and probably the patient was already doing it. I don't really think you need to do tuning forks. Tuning forks, there is an era of medical diagnosis depending on when you trained and where you trained. There are many of us in medicine who like to do the Sherlock Holmes thing, and we love to pick up on every little nuance. We look at the fingernail beds and we look at the soles of their shoes and we ask them what they have in their pockets, and we try to come up [Matt laughs] with the diagnosis without having to send them to the truth tunnel for an MRI or something. I think if that's some of the joy of the work you do, absolutely get some tuning forks and look in their ears and do all that stuff. But the reality is, if they complain of hearing loss, they need a hearing test. Wife deafness doesn't show up on an audiogram.

[laughter]

it's a separate problem. But if their family is complaining, if somebody who has gradually progressive hearing loss really doesn't notice it. It's one of those boiling-a-frog thing that it's so gradual that they know what they're hearing, but they don't actually know what they're missing, they don't have a clue. People around them are much more aware of the hearing loss than the patient is. The patients who have hearing loss, they get very defensive because they don't want to seem old, and they learn to smile and nod and make believe they know what you're talking about. They try to laugh when they see everybody else laughing. They have all kinds of adaptive strategies to try to mask the problem that they're kind of out of it.

And that said, hearing loss is very isolating. It's also a problem because in our culture where we're so biased about age, if you see somebody who's gray or bald and they're like not laughing at your joke, or you ask one question and they answer a different one, or you speak to them and they ignore you, they seem like a space shot. The assumption is that they're experiencing cognitive decline. And hearing loss can masquerade, can mask or look like cognitive decline, but really the only problem is the patient didn't hear you. It's a critical thing to think about when you're doing a mental status exam or any kind of formal or informal cognitive assessment on your older patients.

Matt: It's a great point. I wanted to ask about, if we sent this patient, let's say they had audiometry, it showed a bilateral sensorineural pattern of hearing loss, and it looks like it's worse at the higher frequencies, now they're seeing you in the office, Steve what might that conversation, how might you explain that to them? And what sort of things might you tell them? Prognosis, treatment that sort of thing.

Steve: When we do a hearing test, a comprehensive audiogram has two parts. It has a measurement of hearing threshold or loudness, which is basically plotting out what's the softest thing they can hear across a range of frequencies, kind of like going up the piano, looking from lower pitch to higher pitch, and see how their sensitivity varies. We do a measure of hearing clarity. It's called word recognition score, discrimination test. The threshold is done first and we figure out what level of loudness does the patient have. This is plotted on an audiogram where the x-axis has a frequency from low to high and the vertical axis has loudness in decibels. And the plot is standardized internationally and it's normalized for normal human hearing. So, normal

people have hearing between 0 and 20 decibels all the way across the top of the audiogram. As they lose sensitivity, the curve gets lower and lower on the page.

And so, you might see a flat pattern where it's reduced at all frequencies or you might see one that's worse in the highs or worse in the lows. The most common pattern of age-related loss is worse in the high frequencies. That high-frequency roll-off starts very high and it erodes across the page as you have more and more birthdays.

Speech sits right in the middle of the frequency domain that we measure. In human speech, different speech sounds have different characteristic frequencies. So, vowel sounds, "Aa, O, Ooo" are relatively low pitch and some of the consonants like "S or F, or Th, Sss, Fff, Ffff" are very high-frequency hissing sounds. Those are the things that get clipped out first. Somebody with a high-frequency hearing loss, you could sort of simulate it on your radio if you turn up the bass and turn off the treble and it just sounds like old-time FM radio voice, that sort of [onomatopoeia] [Matt laughs] low-frequency sound, and you can't make out what the guy is saying.

That's what high-frequency hearing loss sounds like to the patient. Once we know their threshold then we do the word recognition test and we turn up the sound so it's loud enough, it's well above their auditory threshold. We're beyond audibility and we're measuring intelligibility and we deliver a list of words or hundreds of lists. But basically, the voice on the recording, it's usually a digital recording, so it's pretty standard. It says, you will say and it gives a monosyllable with a consonant envelope and a vowel in the middle. You will say hit, you will say bike, you will say muff, you will say hut, you will say bat. It goes through a big, long list. And the audiologist records the percent correct. There're no contextual cues like listening to a sentence. There're no syntactic or prosodic cues. It's just a little blip of sound and did you get it?

In a normal person, they should have more than 90% of the words correct. When we measure hearing loss, some people have lost loudness, but if you correct for the loudness, their hearing is actually crystal clear. Many people as they lose hearing, they lose both loudness and clarity. It's a little bit of a rough approximation, but generally, if you lose auditory hair cells, you lose loudness. If you lose neurons, you lose clarity. Many people depending on their genetics and on the cause of their hearing loss, they lose both. Hearing aids make stuff louder. Hearing aids are amplifiers. Whatever aspect of their hearing loss is a loudness deficit is very correctable. Hearing aids don't do anything for clarity. If somebody has a loss of clarity, that's like a radio station that doesn't tune in very well, and you can crank up the volume, and it is still not a satisfying listening experience.

Patients with poor discrimination, they may still get some benefit from hearing aids, and the benefit may still outweigh the aggravation, but they're not happy about it. They are not enthusiastic hearing aid users because they hear a lot more, but they don't hear a lot better.

Matt: Is there a fix for the clarity, or is that still, is that like a cochlear implant or-- I'm totally [crosstalk] on this subject.

Steve: Right now, a cochlear implant is the only remedy for clarity. Cochlear implants are generally done when the clarity scores get down below 50% on that word recognition test. At least historically, we haven't done cochlear implants until both ears are down below 50%. In the last few years, a few medical centers around the world are beginning to do cochlear implants for single-sided hearing loss, and they're beginning to, at least in the US there are now some insurance companies that will pay for that. It costs close to $100,000 to get a cochlear implant. If

your insurance isn't going to pay for it, you're not likely to get one. [Matt laughs] Patients who've had cochlear implants get a post-op word score, typically around 50% to 60%. If your word score was at 20 and you bring it up to 50, it's fantastic. If you're already at 50 and you go through a couple of hours of surgery and all of the recovery and you still have 50 or 60%, it's disappointing.

Matt: Yeah.

Paul: And if your other ear has 100% clarity, a 50% ear sounds like junk, and you won't even want to wear [Matt laughs] your cochlear implant. It's a last resort for people who are unaidably deaf on both sides, and for those patients it is fantastic. And nobody lives in silence anymore. Everybody hearing with hardware. Lots of people do that. Living in silence for people who've had a hearing and lose it, who have acquired deafness, we can always bring back some usable hearing. Now, there's a huge biotech biopharma industry trying to figure out how to regenerate hair cells and neurons and all kinds of other ways of restoring sensorineural hearing loss, but we're not there yet, stay tuned.

Matt: Yeah. I hear Elon Musk is thinking of a Neuralink, some sort of brain [Paul laughs] implant that's going to-- and then eventually then we're going to start using it not just for hearing, but to access the web and things like that. Yeah, we will be Cyborgs, Paul.

Paul: Great. Finally, I welcome our robot [unintelligible [00:22:34]. I was going to ask, I know typically for me, as we discussed, are you having a hard time hearing, yes, okay, then we should have you see an audiologist and from there it's kind of mysterious what happens. I wonder if you couldn't, I know there's going to be some variability geographically with insurance and that kind of stuff, but typically if someone needs hearing aids, can you sort of talk us through what that process looks like? How easy is that for the average patient to get? I know this is not exactly a clinical topic, but it still seems fairly relevant to the discussion.

Steve: So, in the US. In all 50 states, every single state has a state law mandating that anyone who wants to sell you a hearing aid has to give you a minimum of 30 days money back trial. So, we can look at somebody's audiogram and I described a moment ago about how that's acquired. It should be done in a soundproof booth by a licensed audiologist who knows something about what they're doing and the equipment is calibrated and all that other stuff. But assuming you've had a good audiogram, somebody can look at the audiogram and we have audiometric criteria for recommending a hearing aid. Specifically, we see that the hearing and the speech range in the mid-range is worse than 30-decibel thresholds. Normal is 0 to 20, 20 to 30 is it begins to be a problem, and when you get worse than 30, patients are much more aware they're having a problem.

Often, they notice it very suddenly. I'd give you the analogy of somebody who's standing in a swimming pool and the water is like at their upper lip and they're doing fine, but if the water gets a half inch deeper, they all of a sudden have a big hit on their quality of life. That's kind of what we see on a 30-decibel audiogram. They go from 30 to 35 and all of a sudden, they're drowning. They're missing a ton. Even though the actual change in hearing was very small, the impact is big. If we see an audiogram in that range, we recommend a hearing aid fitting and hopefully, the audiologist will interview the patient about their listening needs. Do they go to the symphony? Do they go bowling? Do they have to work in big groups, little groups? Do they watch TV all day? Do they work in a machine shop?

What environments are they in and what do they need and want to hear? Based on that, the audiologist can make some recommendations about what hearing aid instruments are worth trying. There are over 400 models of hearing aid on the market. There are about five big companies that currently hold about 80% of the world market share for hearing aids.

Paul: Wow.

Steve: The rumor is that they all get their chips from the same factory in Taiwan. There really is very little difference from one company to another. When I talk with patients about this, this is all the same stuff I tell them. Shopping for a hearing aid is like buying a car. All the cars have four wheels and a motor and a steering wheel. All the hearing aids have a microphone and amplifier and some speaker. Every car company makes a two-seater sports car and a family sedan and a station wagon and an SUV. For hearing aids, it's the same thing. There's a two-seater sports car and there's a minivan. You can get the economy model or leather upholstery and a sunroof. All of that is the same for hearing aids. There are some people who really just want like on and off switch, like the simplest, no frills, basic.

Other people want a Swiss Army knife with all the features and all the options and I don't know. I expect all of you to have a microwave in your home, and the microwave can bake a pie and roast a turkey and do all kinds of things, but you set it for 20 seconds and heat up your coffee. [Matt laughs]. Do you really want to buy something that's got all of those fantastic features and just use the on-off switch? The audiologist is trying to figure that out by interviewing the patient and then match them with something they're going to teach them how to use it, try to coach them about when to use it and how to use it. And then you send them home for a month or longer. Some places have a longer trial period and at the end of that, then the patient can make an informed decision about whether or not to try the hearing aid. And I really push on my patients. Many of them are worried about the cosmetic aspect of the hearing aid, that they're going to look old, now everybody's got stuff stuck in their ears.

[laughter]

Steve: It's a stigma of having something in your ear has vanished, makes you look young.

Matt: That's such a good point.

Steve: Getting hearing aids that are a fashion statement. Especially seniors are concerned about looking old and they're really not thinking about the cosmetic aspect of the hearing loss, about not responding when people speak to them, about not laughing at the joke, about, misunderstanding the questions, and appearing senile. If you tell them about that, all of a sudden, they have a very different attitude about trying the hearing aid. I really push them to not to make the emotional decision, but to get the hearing aid, use it for a month, then decide if you want it. And if you don't, you return it and you get your money back less the service charge.

Now, I have just one last thing to say. Well, two last things to say about that. One of them is that the whole game has changed recently in the US because there's a new federal law about direct-to-consumer hearing aid sales. Now just emerging and I'm sure you're going to see tons of it over the next two or three years. You'll be able to walk into big pharmacy chain stores, the CVS and Walgreens and everybody else, and Electronic Stores and Target and Best Buy and like, anywhere. They're going to sell hearing aids just like you can walk into the drugstore and buy reading glasses.

These are not regulated by the FDA to the same degree as traditional hearing aids. Traditional prescription hearing aids are $3,000 to $5,000 each. And the over-the-counter hearing aids are projected to be in the $200 to $800 range. So, you know, one-tenth price, one-fifth price. Now, prescription hearing aids typically last about five years. If the over-the-counter hearing aids need to be replaced every year. At the end of five years, you may have spent the same amount of money, but these instruments are going to be millions of them out there. I don't know which ones are good, which ones are not. That information will trickle out. If you read Consumer Report or you read Wirecutter in The New York Times, there all kinds of tech review services that are going to be watching this very attentively. Most of these devices are going to have a controller app that you put on your phone and it'll let you set the loudness and the balance and it'll be Bluetooth compatible so your phone can broadcast directly into your hearing aid. There're going to be all kinds of cool technology available in the next few years.

But you know what? If your grandma is 80-something years old and still uses a landline phone, teaching her all of this stuff about using a hearing aid is really a challenge. Right now, audiologists who dispense hearing aids are the ones who do that. It's going to be tough for grandma to walk into CVS and buy a hearing aid off the rack and go home and get the best use of it. [Matt laughs] I think there may be some hybrid situation where people buy their own hearing aids, but then they go make an appointment with the audiologist to learn how to use it. Just like calling tech support for your computer you know. [Matt laughs]

Paul: Sure, or even like insulin teaching in the primary care office. It's not that different. That's great.

Matt: I think we should try to recap the first case and resolve this, Paul, and then move on to the next case, because we'll go through some other cases. So big points so far, at age 75 about two-thirds of people, Paul, could have criteria to get hearing aids. Just looking at the patient's age is a good guess of do they have hearing loss or not and what type they might have. The true red flag is if someone has sudden hearing loss within 72 hours, unilateral, that's a red flag diagnosis. We're going to talk about a case of that. As far as hearing aids go, they work to make stuff louder, but the clarity portion of things, Paul, they don't really help as much with that. Cochlear implants maybe can address that a little bit but as we said, we talked in depth about who may benefit from cochlear implants, and they have to have pretty severe bilateral hearing loss that's severe.

As far as the hearing aids go, we just talked about there's going to be some over-the-counter products coming that'll be cheaper, but we don't know the quality and how long they'll last. And the traditional hearing aids last three to five years. They cost around $3,000 to $5,000 and they're prescribed by an audiometrist is that the right word?

Steve: Audiologist.

Matt: [crosstalk] audiologist. It's late Paul, I guess.

[laughter]

Matt: An audiologist would fit them and show them how to use them and talk to them about the products there. So, let's say we--

Steve: I just to add two things to your summary because that was great. There are two dirty little secrets about hearing aids, and I try to warn the patients about it so that they're not

disappointed or upset. One of them is that they only work if you put them in your ears. [Matt laughs] Buying the hearing aid and sticking it in your dresser drawer, glove compartment is not economical. The second thing is that the hearing aids don't know what you want to listen to. They just make everything louder. They don't discriminate. So that in a quieter environment, having a conversation around the house, talking to the kid at the checkout counter or at the grocery store or everyday life, hearing aids can be very useful. If your complaint is discriminating speech in noise, you have trouble at social events and loud restaurants, hearing aid is not going to make you happy.

And there are a few workarounds. You can get a remote microphone that you clip on your dinner date that Bluetooth's into the hearing aid, but it only can hang one other person, not everybody you might encounter at the party. Hearing aids are aids, but they're not perfect remedies.

Matt: Yeah, this has been great. This is total new ground for me, Paul. I didn't know hardly any of this stuff that we just learned here. I think this is very useful to counsel patients when we're sending them to audiometry, because right now I'm just sending them with, no, I have nothing to add. [Paul laughs] I'm like, yeah, we'll send you there.

Paul: Somebody else should do something.

Matt: I don't know what happens either. [Paul laughs] Maybe tell me what happens next time. Okay, so Mr. Weber, we hook him up, we teach him all this great stuff we've just learned. He gets some hearing aids, he's happy. But now Paul, I think you have another case. Why don't you tell us about Ms. Eustace?

Paul: I was going to use Eustace, just to say-

Matt: Eustace.

Paul: -but I could be mispronouncing. But we'll say Ms. Eustace is a 50-year-old diving instructor who enjoys cold water swimming, has recently had COVID, and comes to your office saying she's had sudden hearing loss in her right ear for the past three days. It is not painful. She thinks she maybe has water in her ear. She feels like she always has wax in there. She does endorse instrumentation with cotton tips to try to clean the things out. We look in her ears in the office with an otoscope because we're excellent doctors and we don't see anything abnormal. We do see the tympanic membrane, so we feel very proud of ourselves. The patient also endorses that she hears some buzzing in that same ear as well. We do the right thing, having just listened to this episode, and refer this patient promptly to the ENT clinic. I wonder, for this patient who has-- and we talked a little bit about this, who now has this acute unilateral hearing loss, how is your approach different and how are you thinking about this patient differently than the last patient that we just saw?

Steve: The majority of people with sudden hearing loss have conductive hearing loss. They have earwax that's occluding the canal, or they have fluid behind the drum from a head cold or hay fever, or taking an airplane trip and having impaired eustachian tube function. Most of the people with unilateral sudden hearing loss don't really have an emergency, but there are some who do because it's a unilateral sensorineural hearing loss. It's a sudden nerve deafness and that is an emergency. Traditionally, the way we would assess that at the bedside in the examining chair is with a tuning fork test, doing a Weber test where you put the fork on the front of the forehead and you ask if the sound lateralizes. Most primary care settings and most

emergency rooms don't have tuning forks and if they do, the people don't necessarily know how to do the test properly.

It turns out there's a very easy thing you can do without a tuning fork, which is to ask the patient to "Hum", to just go "mmmm." It turns out that if they have a conductive hearing loss, they will hear their voice in the blocked ear. And you can do the experiment. If you stick your finger in your ear that's a 40-decibel conductive hearing loss. You can put your finger in your ear and hum, or you can start humming with your ears open and then block one ear and your voice jumps into the blocked ear. If they have a sensorineural loss, their voice lateralizes to the healthy ear, opposite direction. If you want to have it as a mnemonic, if they hum and their voice goes to the bad ear that's good. If it goes to the good ear, that's bad.

[laughter]

Matt: But this is the same way to interpret the Weber, right?

Paul: Exactly the same way when we interpret.

Matt: It's the same because you're essentially doing the same thing.

Steve: Yes. But you don't need the tuning fork. They just hum.

Matt: I love it.

Steve: And you get the exact same response. Your clinic nurse could do it over the telephone. When they call for an appointment, the nurse can ask them to hum. If the voice lateralizes to their good ear, the one that does not feel blocked, they need to get to an ENT within the next 24 hours. It's urgent.

Matt: See, Paul, this is why we do the show.

[laughter]

Paul: It's [crosstalk] like this.

Matt: Just [crosstalk] Paul.

[laughter]

Matt: I love that.

Steve: Okay, I hope you can look in their ear and I hope you can clean the wax and see the drum and be able to tell if they have an air-fluid level or some other retracted drum, some other abnormality that might explain a conductive loss. If they have a normal-looking ear and their hum test lateralizes away from that blocked ear, that's an emergency. That's idiopathic, sudden sensorineural hearing loss. About 1% of those patients have something neurological, like a vestibular schwannoma or a stroke or a meningioma, MS, demyelinating disease but 99% of those patients, their MRI is normal, they need some corticosteroids ASAP.

Matt: Steve, can I ask? The differential for this, idiopathic sensorineural hearing loss, that's on the differential. But there's a bunch of different infections like viral infections, all sorts of things,

autoimmune conditions, trauma, toxins, all sorts of things. We're still taking a history asking, like drug exposures, trauma-

Steve: If you want?

Matt: -infectious symptoms. Do we think they have lupus or other some autoimmune thing? It sounds like that's probably not going to be the majority of the time that we're going to need to do.

Steve: Like I said earlier if you're that Sherlock Holmes guy and you want to take time collecting all that information, feel free. No matter what, they need an MRI and steroids.

Matt: Got it.

Steve: There is a window of time that arguably is the first two weeks. So, most of us will treat our patients even if they come in up to four weeks. But if they've had that hearing loss more than four weeks, they're out of luck. Nothing's going to bring it back. And every day that passes without treatment, the chance of hearing recovery goes down. It really is an emergency to get them evaluated. If an audiogram confirms a significant sensorineural hearing loss. We all treat them with steroids, either by mouth or by injection directly into the ear. Some docs do both, but the standard treatment almost everywhere is steroids for a couple of weeks.

Matt: Steve, I'll tell you a secret about internists. They all think they're Sherlock Holmes.

[laughter]

They all want to be Sherlock Holmes, but you got to make your day fun. We don't get to surgerize people, so we have to do this cognitive weightlifting of trying to think through it.

Steve: I'm not critical of that. But no matter what you discover, Sherlock-

[laughter]

Steve: -you need to send them for a hearing test, and you need to get on the phone to your local ENT person and tell them that you think this person has idiopathic sudden hearing loss. They can't wait until next May for an appointment.

Matt: Yeah. I'm thinking about how-- Paul, would you be pulling the trigger on the MRI and the steroids, Paul, before sending this person? I'm not sure depending on--

Paul: Possibly the steroids. This is not something I encounter very often, but it sounds like that's the thing that has emergency to us. I was going to actually ask what steroid dose or what steroids that you actually used to, but that might be something I would start while trying to get them to ENT. The MRI from a practical standpoint is not going to happen within the next 24 hours unless I send them to the emergency department probably.

Steve: Yeah, you don't need to wait for the MRI to start the steroids, but you really do want an audiogram before you start the steroids, if it's at all possible because you want to document what their hearing was before you intervene. If the hearing isn't that bad, if they have other medical-- putting somebody on high-dose prednisone for a couple of weeks is not chicken soup. They can have side effects. And different centers use different routines. Our center and a lot of

places will put patients on 60 mg of prednisone every day for 14 days and then a five-day taper, 50, 40, 30, 20, 10, that's a real blast of steroids. You're not going to make somebody cushingoid, but you certainly can throw their diabetes out of whack, and you can give them upset stomachs and sleep disturbances and all kinds of other stuff. I think if you're going to do that, you really want to have an audiogram to show that they truly have unilateral sensorineural hearing loss. And when they come back for follow-up, you've got the MRI by then?

Matt: Yeah. So, it's an MRI with contrast, correct?

Steve: Yep.

Matt: Paul, this reminds me of, like, if we think someone has temporal arteritis, generally I'm referring the person, I'm calling either an ophthalmologist or a rheumatologist, sometimes both and it's like a warm handoff situation. It's not like I say, "Hey, see an ophthalmologist."

Paul: [laughs] Call the number on the paper and I'll see you in three months. Yeah.

Matt: Yeah, it's not like that.

Steve: That's right.

Matt: Okay.

Steve: This condition of idiopathic sudden hearing loss, it strikes about one person in 5000 per year. So, I'm in Metro Boston. We see three to 500 cases a year, but that's not tens of thousands of cases a year. It's a few hundred cases in a city. I don't know how many you're going to see in your practice. The prevailing theories are that it might be viral, it might be ischemic, and it might be immune-mediated. We think those are probably all true in different patients, but we don't have any way to discern who is who. So, we just hose everybody down with corticosteroids and hope for the best. In patients who are treated within the first 10 to 14 days, about 75% of them will get some improvement on the steroid, but only about 20% will come back to normal.

Matt: The tinnitus that this person has, is that typical of somebody with this condition?

Steve: Yeah. In the acute setting, tinnitus is just a generic indication of an unhappy ear. But everybody with hearing loss has tinnitus. It doesn't matter what the cause of the tinnitus is or how long they've had it. It's over 90% of people with hearing loss of any cause or magnitude experience some tinnitus. If the ear is acutely sick, if there's trauma from loud noise, if they have this kind of a sudden loss, if they have an effusion or they have barotrauma from an airplane trip, yeah, they're going to have tinnitus. And that's not really very informative medically, it's annoying, but it's not informative. If the situation, if the damage in there is permanent, they will always have tinnitus. But the tinnitus during the acute phase is much louder and much more intrusive. Over time, tinnitus that begins as a peripheral process really becomes a central process. It's exactly the same as a phantom limb in an amputee.

But in this case, it's hearing that's been amputated. Those auditory centers in the brain that are expecting an incoming signal and not getting it, say "Hey, where's my signal?" And they turn up the gain in the brain, and you begin to hear the random electrical activity in that circuitry just like static on your radio and there's no station. That kind of central tinnitus, somewhere between 30 and 90 days after ear damage, it transitions from peripheral to central, and then it doesn't

matter. You could remove their ear you could cut the nerve. The tinnitus is still there. It's living in the brain.

Matt: Do you have any tips for the patient that's suffering from that chronically? I know this if we could do a whole episode on tinnitus, but what can we tell them to do?

Steve: The first thing is that you want to assess hearing in somebody who's got tinnitus, because if they have hearing loss, they're going to have tinnitus, but they might have tinnitus for other reasons, and they might have normal hearing. For people with chronic tinnitus, whether it's unilateral or bilateral, we don't really care what it sounds like. It could be hissing, humming, buzzing, chirping, quacking, shrieking it doesn't make any difference. We do separate pulsatile tinnitus to a separate category, but if it's just the more or less steady sound of variable intensity, we think of that like an alarm system for your general health and well-being. When you are sick, when you're tired, when you're stressed out, when your muscles tighten up, it's going to be louder. When you're at Club Med on the beach, you're not going to hear it.

If you are finding your tinnitus to be more intrusive, it's bugging you more, you're noticing it more. It's a time to take inventory about those other health and wellness metrics. sleep, stress, fitness, nutrition, your neck, are you hunched over your computer keyboard all day or just carry tension in your neck? If you take care of that stuff, the tinnitus kind of moves into the background. It's also important to know that tinnitus is an attentional process. That means when you attend to it, you put it right on center stage and amplify it. When you attend to something else, it kind of gets pushed aside. I'd give you the vision analogy of windshield wipers. When you drive on a rainy day, those wipers are going back and forth in front of your face. You don't even see them because you're looking at the road. If you watch the wipers, you couldn't drive your car. People who fall into the trap of checking on their tinnitus or noticing it or listening to, it makes it worse. When I was young and training, we had a very famous ear professor, and he would ask his tinnitus patients what size shoe they wore? Size 10? Go out and buy a pair of size 9. By the end of the day, you won't notice that tinnitus.

[laughter]

Matt: What an empathic he is.

[laughter]

Steve: He was not wrong. Yeah, he was very empathic. He also used to say to the patients, don't worry about it unless it stops because that means you're dead.

[laughter]

Matt: My God.

Paul: Cold comfort.

Steve: Yeah, I don't say that to patients generally.

Matt: All right. So, to recap what we talked about with M. Eustace, Paul, Eustace for eustachian I guess. So, we've sent her for an audiogram. She was started on the steroid, 60 of prednisone for about two weeks or so, then it was tapered. She had an MRI, no schwannoma, no multiple

sclerosis, no other retrocochlear pathology, and we're hoping that she will fully recover. Anything else Steve, do you think to talk about with this case here?

Steve: Patients who lose one ear or lose some of the hearing, who have asymmetric hearing loss, they have three symptoms if you count tinnitus. They all have tinnitus, but that's intense at the beginning and it gradually tends to move into the background over six to twelve months regardless of the hearing outcome. But the two auditory things that persist, they lose the ability to localize where sound is coming from. If they're driving and they hear a siren, they have to check all their mirrors looking for the flashing lights. If they lose their cell phone in the house and it's ringing, they can't find it.

Paul: Oh my gosh. [Matt laughs]

Steve: So, they lose sound localization and they have increased difficulty discriminating voices in noise because all the noise and the voice are funneling into the same ear. They can't position themselves with one ear toward the noise and one ear toward their dinner date. Those two manifestations of single-sided hearing loss are very annoying, but they're not really a big handicap. If you had single-sided deafness, you could not get a job as a commercial airline pilot or an FBI agent but that's about it. In medicolegal instances, single-sided deafness is considered zero handicap. There are formulas to calculate percent disability. It isn't a disability to be deaf on one side. A lot of people are born deaf on one side. They don't even know, they never noticed or they lost hearing one side in early childhood, they play sports, they do whatever they want, they become musicians. It doesn't really cause a handicap.

If you're used to having stereo binaural hearing and you lose it's very disturbing. But gradually people get used to it and it's not life-altering for most patients. I try to calm down my patients and we go through the treatment and all of that stuff. I really tell them to don't rush to try unproven therapies, don't rush to buy expensive electronic equipment or get implants in your head or anything. Give it a year, see if you get used to it. And almost everybody gets so used to it a year later they're hardly really noticing it.

Matt: But if that neural link thing happened to real [Paul laughs] Elon Musk thing, I think everyone should get that. But anyway, [laughs] this is great. I think with the rest of our time we should go through one more case. Paul, I think this is Ms. Anita. Do you want to read that?

Steve: Sure.

Paul: So, our last patient of the day will be Ms. Anita. She is a 28-year-old patient. She is coming to the primary care office with a two-year history of fluctuating hearing loss. She also notes a sensation of fullness and muffling of sounds in the right ear. She notices intermittent buzzing noises in that same ear. The last couple of months she's been experiencing episodes of severe dizziness. They last about 4 hours, they resolve spontaneously. When she has them, she's experiencing nausea and vomiting. No other significant past medical history. We do otoscopy in the office, it shows no pathologic findings. Audiometry reveals that she has low-frequency sensorineural hearing loss with normal hearing in the mid frequencies. So, we're painting a picture for Ms. Anita, but for you seeing this patient, is there a broad differential that you think about as you're approaching this patient who has the symptoms of both vertigo as well as waxing and waning hearing loss?

Steve: Right, so, she meets all of the international diagnostic criteria for Meniere's disease, which includes low to mid-frequency sensorineural hearing loss, either fluctuating or

progressive, episodic vertigo on more than one occasion. The vertigo should be anywhere from 20 minutes to 12 hours, and typically with some tinnitus or aural fullness. She meets all those diagnostic criteria; however, Meniere's disease strikes about one person in 5000 per year. It's very similar to sudden hearing loss in the US. In the whole United States, it's estimated there are about 60,000 cases that pop up. And its typically people who are in their 40s and 50s and 60s. She's quite young and it turns out that vestibular migraine, which is migraine causing vertigo and auditory symptoms, could cause all of these symptoms and migraine in a young woman between puberty and menopause, 30% of women meet diagnostic criteria for migraine headaches or ocular migraine.

And so, regardless of sex or age, anytime we see a dizzy patient, it's imperative to take a headache history. I would say even broaden that out to say a migraine history, because not everybody with migraine headaches has headaches. They may have ocular migraine, or they may have irritable bowel syndrome, or they may have fibromyalgia, which are all various manifestations of migraine. They may have first-degree family members who are migraineurs, or they may have had benign recurrent vertigo of childhood, or they may have had severe recurring abdominal pain in childhood, which are all pediatric versions of migraine. So, a young woman who's coming in with ear symptoms and vertigo, the chance of this being migraine is 10 to 15 times greater than the chance of it being garden-variety Meniere's disease.

Now, there is no test for migraine. It's a clinical judgment, but you certainly should get the headache history and if it turns out that every one of her dizzy spells' transitions to a killer headache, or every headache transitions to vertigo, or they tend to co-occur their comorbidities, or if there are migraine indicators, if every time this patient has one of her vertigo attacks, she's intensely photophobic, for example, that would be-- Meniere's doesn't cause photophobia. Migraine is a neurological condition and if you listen to migraineurs tell their story, they have vision things, they have other sensory, they have numbness and tingling, they have nausea, vomiting, brain fog. They've got this laundry list of sensory distortions and disturbances. And Meniere's is an ear thing and so if you listen to the story and it sounds ear-ish, it's probably Meniere's. If it sounds brain-ish, it's probably migraine. Sherlock, this is right up your alley.

[laughter]

This is the perfect instance for you to really stretch your stuff. You're going to be a hero by listening carefully to them tell their story and then put them on a migraine diet and some other migraine trigger management stuff and see what happens.

Matt: I have diagnosed some people with chronic sinusitis as having migraine headaches now so--

Paul: That one feels good.

Matt: That one does feel good, yeah. You were going to ask something?

Paul: Let's say Matt takes a spectacular two-hour history. His entire office session doing nothing else. And it feels very eerie to him. I guess, other than giving me vague flashbacks to medical school, I feel like I don't have a great handle on what causes Meniere's. I feel like I'm reading about endolymphatic hydrops as a thing. I don't know what that means. I think actually the paper you wrote talks about the fragile ear. And the treatment of that is actually pampering the ear, which I thought was a funny way of framing things. What do we know about why this is happening if we actually nail the diagnosis that happens in one in 5000 patients?

Steve: What I've written and what I teach and what I think is widely accepted, not just by me, is that the ear like every other organ in the body-- every organ in the body has a limited repertoire of response to injury. If you beat up a liver, it makes cirrhosis. You can beat it up with a virus or with a toxic drug or with radiation, but it gets cirrhotic. If you beat up an eyeball, the retina can degenerate, the lens can go opaque, or the pressure can go up. Those are the three things eyes do when they're sick and unhappy. If you beat up an ear, you can get dizzy or you can get deaf or both. If a patient has a problem that affects both hearing and balance, and if the symptoms are episodic, we call it Meniere's disease. At kind of the most basic level that's the label on the dumpster full of all the people with erratic inconsistent ear function.

We try to draw a slightly tighter boundary by saying that the hearing loss early on is predominantly low frequency and the vertigo is 20 minutes to 12 hours, but it's a sick ear. We've learned in the last few years that-- let me back up and just say that if we look at hundreds of Meniere's patients, we see that it's about equal male and female. Most people develop symptoms in their 40s and 50s, two-thirds of patients have their vertigo attacks in clusters and then have smooth sailing for months at a time, and one-third of patients just have sporadic attacks. It's very uncommon, maybe 5% of Meniere patients identify reliable triggers every year during hay fever season or a woman where every month when she's perimenstrual, she might get an attack. For the vast majority, it's pretty random. We don't really know what's wrong in that ear. We don't know if it's genetics or trauma, childhood infection, bad karma, alien ray beams. We don't really know what's wrong with the ear, we just know it doesn't work right.

Matt: If we did those bedside tests, this is like more of the sensorineural pattern?

Steve: It's a sensorineural loss. We've learned in the last few years that about almost one-third of Meniere patients have a congenital malformation of the vestibular aqueduct, which is a little canal where inner ear fluid recycling happens. If you know what to look for it, you can see that on a high-resolution CT scan, but hardly anybody looks for it because it's quite new information and there's nothing you can do about it. However, the phenotype of patients with that hypoplastic aqueduct is interesting because it is much more likely to affect both ears and lead to binaural Meniere's and it's much more common in men than women. People who have that their Meniere's symptoms usually start in their 20s or 30s, not in their 50s. Where we've had this dumpster full of Meniere patients, we're beginning to find that we can lift subgroups, we can begin to bin into smaller groups certain subtypes of Meniere's disease by other clinical features.

The people who do not have that vestibular aqueduct hypoplasia have degenerative changes in the mucosal lining or the epithelial lining of the endolymphatic sac. We don't know why that sac lining is degenerating, but it leads to all kinds of homeostatic failure in the inner ear. What's really important to convey to a patient if they do have Meniere's disease is that we can always get rid of their vertigo attacks. Over 99% success controlling Meniere vertigo attacks, but nothing we do preserves the hearing. At least currently in 2022, everybody with Meniere's disease gradually loses hearing in the affected ear and none of the treatments seem to prevent that. A Meniere ear is a degenerating ear. It's not that Meniere's causes degeneration, it's the degeneration causes the symptoms that we call Meniere's syndrome. We don't know why the ear is degenerating. Eventually, 75% of Meniere ears degenerate to a point we call burned out within about 10 to 15 years. A burnt-out ear has no usable hearing, the hearing is so poor that they can't use it or wear an aid, and it doesn't have the horsepower to make vertigo anymore. Not everybody burns out in 10 years, but 75% of people burn out in about 10 to 15 years.

Matt: I do want to get on to treatment of this, but I want to recap quickly. This is not as common as vestibular migraine. We should really take that history, which I think that's a great pearl for the audience, and that this is most commonly in people in their 40s and 60s. So, if as a younger person, you might even think it more likely this is a migraine. We mentioned that this was more a low to mid-frequency hearing loss, as opposed to our classic hearing loss of older age is the higher frequency. Is there other testing besides audiometry? Because this is often unilateral, right? Would we also be obligated to get an MRI for these patients, MRI with contrast or a CT scan if they can't get an MRI?

Steve: If you take all people with Meniere's disease, about 25% to 30% of them may eventually involve both ears, but it's almost unheard of for them to be involved simultaneously. It's sequential. One ear goes and then 5, 10, 20 years later, the other ear may act up. Very, very rare to see both ears active in the same timeframe. In fact, it's was so rare that you would want to look for some other weird problem like autoimmunity or some other rare thing. If it's going to be bilateral, it's sequential. If it's a new Meniere patient, we do recommend an MRI scan. The traditional MRI we do with and without contrast, looking for retrocochlear lesions like schwannoma and meningioma and tumor and stroke and demyelinating disease. However, there is a new way of doing MRI. You need a 3T scanner. You have to have the right equipment and you have to have the software, and you have to have a radiologist who knows how to read it. But now for the first time, you can absolutely see if somebody has Meniere's disease.

Matt: Very cool.

Steve: That is not widely available yet. It's showing up at hotsy totsy academic centers, but not all over the place.

Matt: It sounds like this condition is uncommon enough that probably we're not going to be diagnosing and treating this ourselves in primary care without the involvement of them seeing an audiologist and an otolaryngologist and getting some medication advice there. What might you do for this if we have a convincing case?

Steve: I would just say in a general ENT practice, they might only see one or two cases of Meniere's in a year. In an otology practice, we see a lot of it, but in general ENT, it is still very uncommon. So, when we see patients, we do an audiogram, we get an MRI. We say, "Well, yup, sounds like Meniere's disease." For me, I'm a treatment minimalist and I'm looking for the least intervention that will satisfy the patient. So, I use patient-centered outcome metrics. My first line of intervention is some adjustments of diet and lifestyle. Three things, patients do best if they have a very regular daily schedule, so they get their body in a rhythm. Every day they get up at the same time, every night they go to bed at the same time, they eat meals about the same time every day, try to get a little regular exercise.

It doesn't mean they can't skip a meal or stay up late for a ball game or a party. But generally, we want their schedule to be very regular. People who work rotating shifts, people who skip meals and binge, people who do a lot of international travel tend to be much more symptomatic. So, number one is regular schedule. Number two is a general medical tune-up. The year is fragile, and any other systemic stresses and strains might fire up the symptoms, hay fever and allergies, sleep disturbances, acute or chronic pain, anxiety and depression, hormone dysregulation, other metabolic disturbances. You basically want to set all the dials to healthy as best you are able. I will tell you that in the general population, uncontrolled sleep apnea and hormone dysregulation and uncontrolled migraine are the three biggest triggers that make

Meniere's unmanageable. You have to deal with those things if you want to ever calm down somebody's Meniere attack.

The third thing is their diet. When we talk about diet, what we're really talking about is fluid and electrolyte management. I ask Meniere's patients to limit caffeine to one hit per day, maximum could be coffee, tea, coke, or chocolate, and not a super-sized gigantic cup of something, but a regular-sized cup of coffee or tea one a day. Same with alcohol, one drink in a day, it could beer or wine or spirits, but maybe not one of each. The most important thing is we want to even out their sodium intake. There's a ton of literature, old literature about putting Meniere patients on low-salt diet. It is totally bogus. There is no reason to put people on low-salt diet.

Matt: Unless you don't like them. [laughs]

Steve: Well, I mean, if they need it for congestive heart failure or chronic renal insufficiency, fine. But from a Meniere point of view, the ideal is to have very consistent sodium through the day, so it isn't spiking up and down, but it doesn't have to be low. So, if we take all the Meniere patients who walk in and do those three things; regular schedule, medical tune-up, manage the fluid electrolytes, within a couple of months two-thirds of patients have no more vertigo.

Paul: Well, Matt, this actually sounds encouraging to me because this actually feels like primary care stuff. Like we can diagnose and treat OSA.

Steve: You can do that.

Paul: We can manage diabetes. We can manage hypertension. We can talk about diets. This feels really within our wheelhouse.

Steve: Great. So, I'm happy to deputize you.

[laughter]

And everybody else is listening. Now, the diuretic recommendation came from the very early, mid-20th century, when people first learned about endolymphatic hydrops. They said, "Oh, they're retaining fluid in their ear, we should put them on a low-salt diet." And then they said, "Oh, there's too much fluid in the ear, put them on a diuretic." Well, do you believe that taking a diuretic makes you pee endolymph?

[laughter]

Paul: [crosstalk] -questions.

Steve: I guarantee it doesn't. So, the reason that a diuretic might help is because there's all this fluid and electrolyte fussiness in the inner ear and the homeostatic systems are not working. The same potassium and sodium ion pumping things, the channels and pumps that are in your kidney are also in your ear. Diuretics act on the ear to bolster this inadequate homeostatic stuff. We usually use a drug that's a combination of HCTZ and triamterene because we're ear doctors and we don't want to deal with metabolism like potassium. The HCTZ and triamterene, one wastes potassium and one saves it, and so they cancel out. There are a couple of proprietary names for that I won't mention, but easy to find and you get them the generic and they take it once a day. Two-thirds of the patients get better on the diet and lifestyle, it leaves one-third who

are symptomatic, we put them on a diuretic and within a couple of months, two-thirds of them are under control.

So, diet plus diuretic, we have about 90% of Meniere patients who have their vertigo under control. The last 10% need an invasive treatment, which usually is medication injected through the drum into the middle ear, where it diffuses into the inner ear. That can either be a corticosteroid, which works sometimes. It's controversial how well it works, but it is reimbursable.

[laughter]

So, that it's a popular treatment. When it does work, it's quite similar to injecting steroids into a joint, into a shoulder, into a knee. It improves the symptoms for a while, but eventually, it kind of wears off and you haven't really cured anything. Patients who benefit from intratympanic steroid typically need it repeated a couple of times a year. The alternative is intratympanic gentamicin, which in my hands is much more effective, but it's ototoxic. You're killing off some of the vestibular signaling. The idea is you want to weaken the ear so much that it doesn't have the horsepower to make vertigo anymore. In fact, you can think about it like a fast-forward button. It achieves in two weeks what Mother Nature was going to do in 10 or 15 years.

Matt: This has been amazing. I think we are out of time as far as the show goes. I think we're going to say that with Ms. Anita here, we got her on the three, we got her on a regular schedule, medical tune-up, and we counseled her on the fluid and electrolyte management. She fortunately didn't need diuretics or IT Gent as you abbreviated it. So, we've talked about a ton today. But if you had to give a couple of take-home points that you definitely wanted the audience to remember, what would those be?

Steve: Yeah, so I would say that being attuned, being mindful that hearing impairment is a barrier to you providing the best medical care. If your patients are hearing impaired, they can't receive what you're trying to give them because they're not hearing very well, and it isolates them and it makes the interactions with the medical profession more anxiety provoking and it erodes their quality of life. The more you are mindful of wondering about your patient's hearing and considering the possibility of hearing loss, just do the finger rub or to send them for the hearing test or recommend the ENT consultation. Every little thing you do to get their hearing taken care of is to their benefit.

Matt: We will be back with our lightning round. Steve, can you give us a hobby or interest that you have outside the field of medicine?

Steve: I'm a closet musician. I mostly play clarinet and bass clarinet and some guitar [crosstalk] in my day job.

[laughter]

Matt: That sounds like a very healthy diversion from what I imagine is a demanding career. If people are watching on the video, they could see you have nice setup. There's a guitar in the background. It looks great. Paul, we should get some more talents and hobbies in life-

Paul: Yeah, I should do more on this for sure.

Matt: -other than watching movies.

[laughter]

Paul: I know you're right. I'm not well rounded. We make that point repeatedly. Along those lines Steve, maybe we'll narrow it down. I usually ask for this broad culture recommendation, but why don't I ask you about a music recommendation? Specifically, something that you enjoy, that you think our listeners might enjoy listening to as well.

Steve: Ooh, well, my two favorite genres are Klezmer, which is what I actually aspire to play, and Gypsy Jazz, also known as Django Jazz because Django Reinhardt was the originator of it. There're tons of it you can find streaming online. It's fantastic stuff.

Matt: I bet you Paul knows what that is, but I am.

[laughter]

Paul: The former, not the latter. I have some thinking too.

Matt: Yeah. I always like to ask a question about advice or feedback that you've gotten throughout your career, Steve. You've accomplished a lot in your career, but what's some advice or feedback along the way that you would pass on to our listeners?

Steve: I went through a woodworking phase many years ago, and carpenter friends all had the same advice, which was measure twice, cut once [Matt laughs] and I think it's broadly applicable.

[music]

Matt: I think woodworking is also one of those hobbies, it's just a good hobby because a lot of times you have to wear ear protection. It's a good way to take your mind off other things. You really have to focus on what you're doing if you want to keep all your fingers, that sort of thing. So, I enjoy it.

Paul: This has been another episode of the Curbsiders bringing you a little knowledge food for your brain hole.

Matt: Yummy

Paul: [laughs] Great stuff. Get your show notes at *thecurbsiders.com*. And while you're there, sign up for our mailing list to get our weekly show notes in your inbox plus twice each month you'll get our Curbsiders Digest recapping the latest practice-changing articles, guidelines and news in internal medicine.

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And a special thanks to our writers and producers for this episode, Dr. Kate Grant and Andréa Perdigão. The Curbsiders is produced and edited by the team at Pod Paste. Elizabeth Proto

runs our social media, and Stuart Brigham composed our theme music. And with all that Paul, until next time, I've been Dr. Matthew Frank Watto.

Paul: And as always, I remain Dr. Paul Nelson Williams. Thank you and goodbye.

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