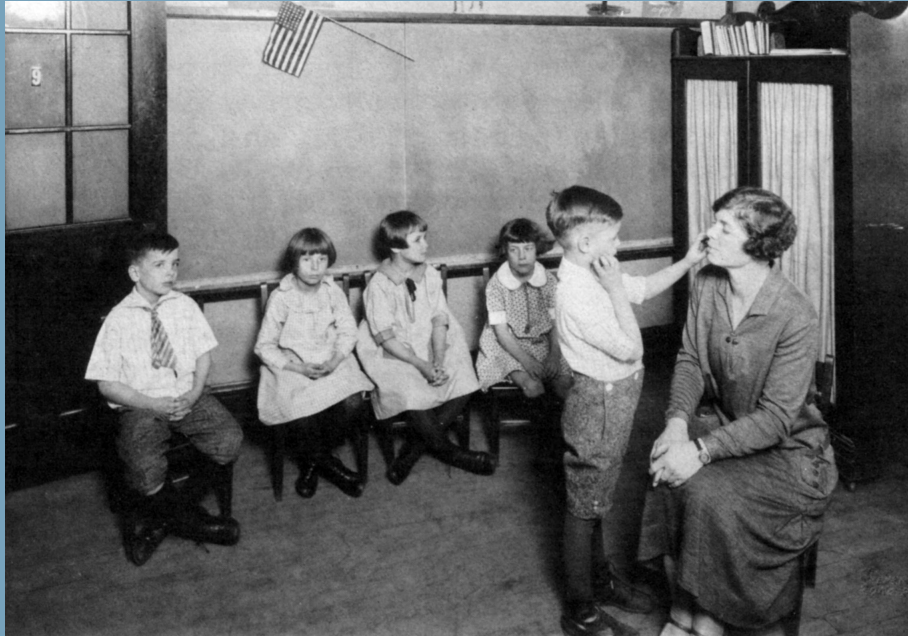


ALL THINGS AUDIOLOGY: DEMYSTIFYING AUDIOGRAMS, ACRONYMS AUDIOLOGY-SPEAK FOR PARENTS

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You've Come a Long Way, Baby...



In 2000, 44% of newborns were screened for hearing loss.
In 2015, almost 98% of all newborns were screened!

Imagine the Possibilities...

Swingset

Car Repair

Hi, I'm an Audiologist...

...and I want to figure out how your child hears and uses sound even though you're just trying to figure out how to get a few hours sleep and remember what day of the week it is.

...Then I want to give your child an accessory to wear that costs \$3,000+, is small enough to be a choking hazard, comes with tiny, toxic batteries and will likely not last more than 3 birthdays!

PS-did I mention it can be easily disassembled and dogs love it as a chew toy?



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Why all of those acronyms???

- OAE
- ABR
- BAER
- TYMP
- HA
- BAI
- CI



Tympanogram (TYMP)



- Shows health status of the middle ear and ear drum
- Helpful in showing if there is an ear infection or fluid in the middle ear
- Fluid or other problems in the middle ear can affect hearing

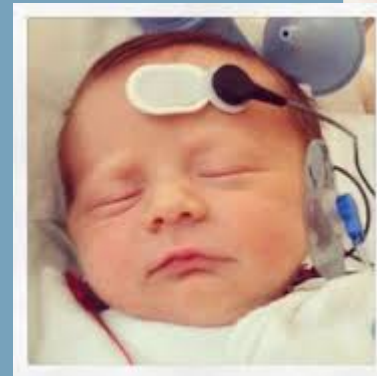
Otoacoustic Emissions (OAEs)

- Tests the function of the outer hair cells in the cochlear (inner ear)
- Probe tip is placed in the ear and sounds are presented
- No behavioral response is required but it is necessary for the child to be relatively still and quiet



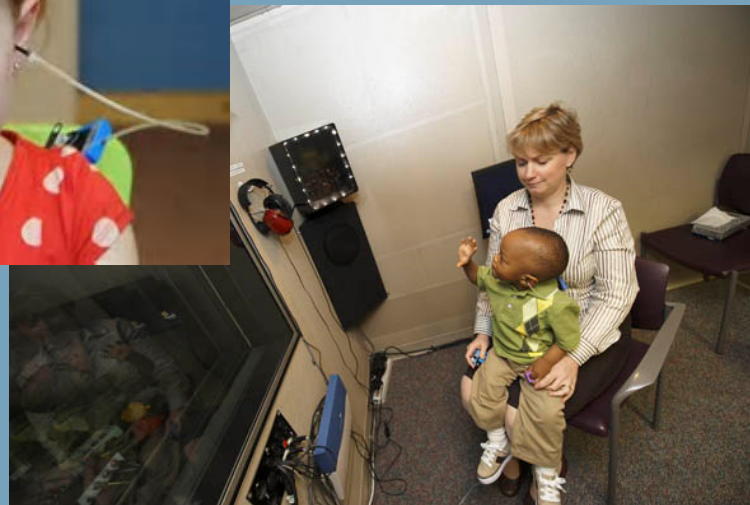
Auditory Brainstem Response (ABR) aka AER or BAER

- Typically completed on ages birth-6 mo
- Screening ABR vs. Diagnostic ABR
- Diagnostic ABR provides comprehensive hearing information for patients who can't do behavioral hearing test
- Records neurological responses from the hearing nerve
- Child must be asleep or resting



The Sound Booth

- Behavioral hearing evaluations (6 months and up)
 - VRA (Visual Reinforcement Audiometry)
 - Ages 6 mo - 2 ½ yrs
 - CPA (Conditioned Play Audiometry)
 - Ages 2 ½ yrs and up



How often should you see your Audiologist?

Every 3 months through age 3...

more frequently if a full audiogram hasn't been obtained



At 6 month intervals from 4-6 years...

if progress is satisfactory and if there are no concerns about changes in hearing

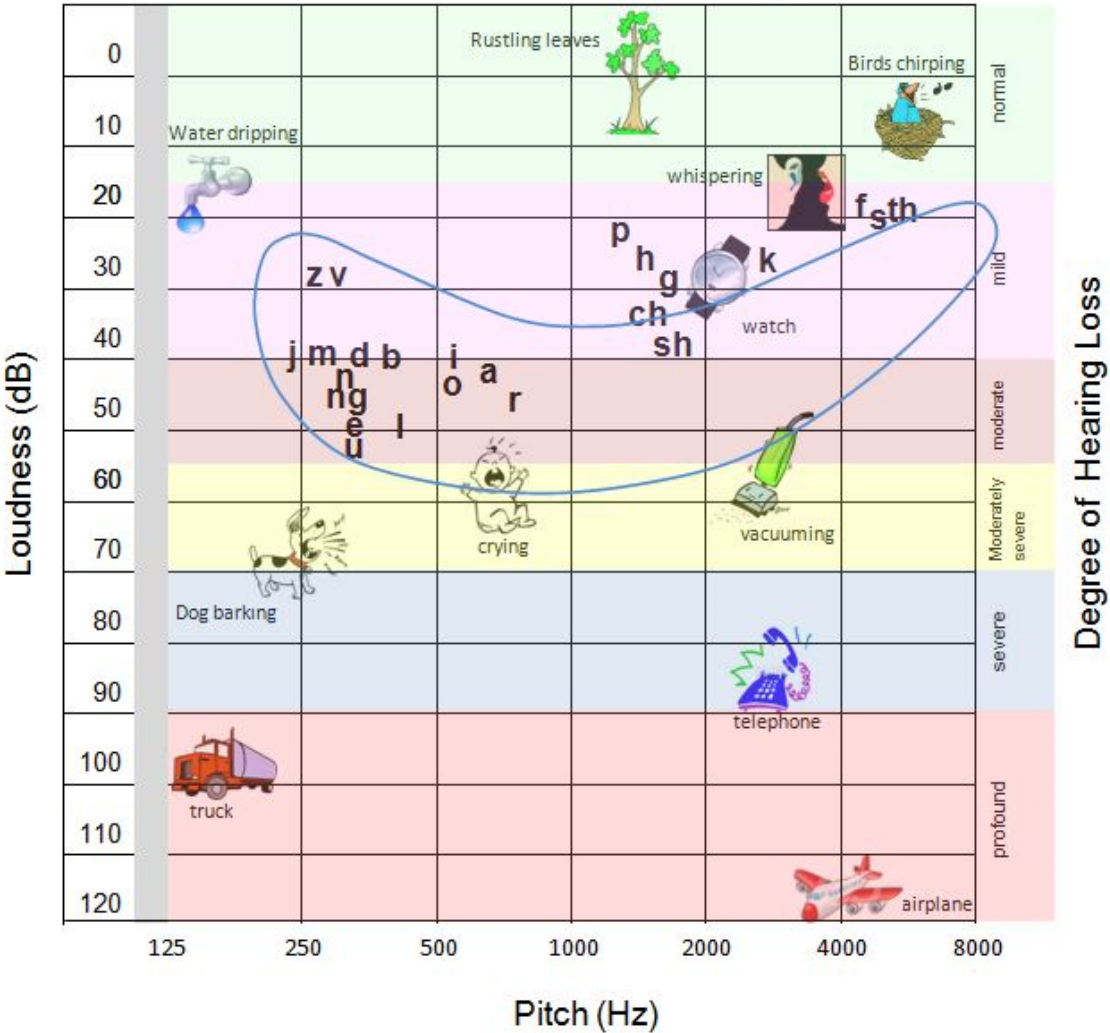
Immediate evaluation....

if parent or caretaker concerns or if behavioral observation by parent, therapist or teacher suggests a change in hearing or device function

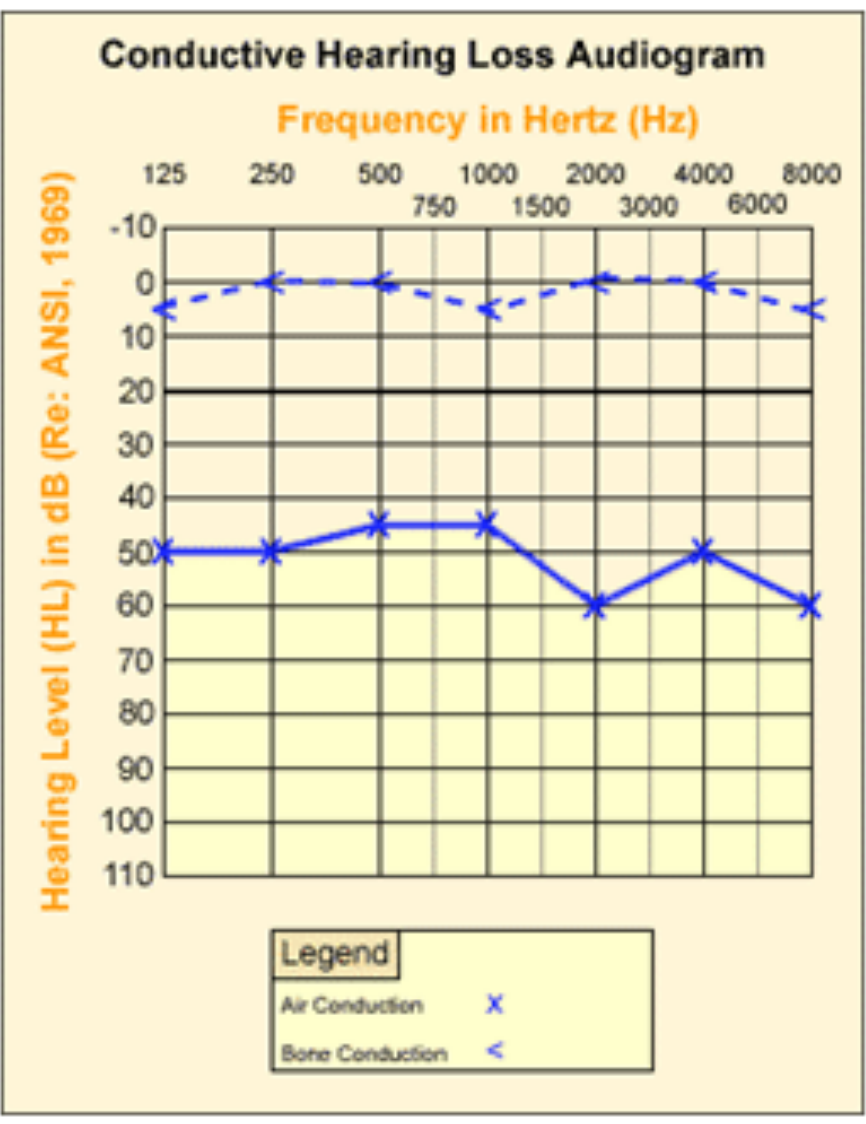
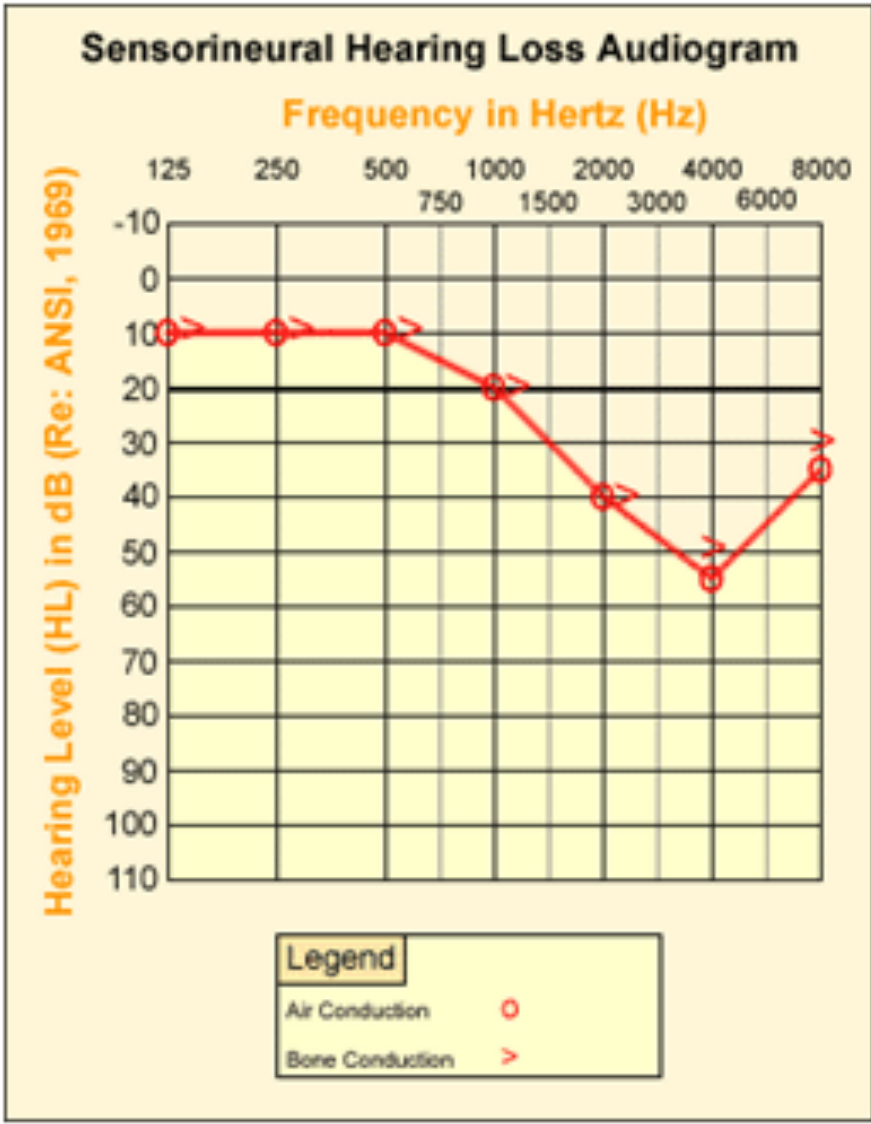
More frequent evaluation...

when middle ear disease is chronic or recurrent or when at-risk for progressive HL

Familiar Sounds Audiogram



Sensorineural vs Conductive HL



There's more than 1 way to talk about hearing loss...

1. Whether or not a baby is born with hearing loss.

*If the baby is born with hearing loss it is called **congenital**--if the hearing loss occurs after the baby is born it is called **acquired**.*

2. Whether or not the hearing loss gets worse over time...

*Hearing loss that gets worse over time is called **progressive**. Hearing loss that does not change is called **non-progressive**.*

3. Whether or not other symptoms are present;

*Is it **syndromic** or **non-syndromic**?*

4. Whether or not hearing loss runs in the family.

*If it does, it is called **familial**; if it does not it is **sporadic***

5. Where in the ear the hearing loss occurs.

*If the loss occurs in the outer or middle ear it is **conductive**. If it occurs in the inner ear it is **sensorineural**. If the loss occurs in both areas it is **mixed**.*

What causes hearing loss?



- Genes: 50-60% of hearing loss is genetic;
 - 70% of genetic hearing losses are non-syndromic (“just” hearing loss)
 - 40% of non-syndromic HL is a mutation in the *GJB2* gene/*connexin*
- Complications of Prematurity:
 - Babies who are born too early and babies who need help breathing are more likely to develop HL
- Infections such as cytomegalovirus or meningitis account for 25% of HL
- Genes + environment can cause HL
 - some medicines can cause HL, but only if you have certain mutations in genes.

What Causes Hearing Loss?



■ Genes cause 50-60% of HL

Genes are passed from parents to children and cause things to run in families

-A gene that does not form in the way it should is called a mutation

-A mutation is any change in a gene that makes it different from a “typical” copy

If the change causes a difference in the way the gene works, the baby may have a particular condition (such as hearing loss) that can run in the family

-Some mutations cause syndromic and others cause nonsyndromic hearing loss.

Even with genetic hearing loss, the mutation may not be in a “known” gene...

Scientists are working to identify all the genes for HL



Behind-the-Ear Hearing Aids

- Recommended for sensorineural and some conductive HL
- Deliver auditory information through the “typical” doorway to your child’s brain.
- Customized for your child’s hearing loss with earmolds to fit each unique ear shape and configuration of hearing

Bone Conduction Hearing Aids

- Recommended for “permanent/long term” conductive HL
Placed on the bone (mastoid) located just behind the ear and are held in place with a headband.
- Sound travels through the mastoid bone to the auditory nerve and then to the brain
- Around age 5-6, one part can be surgically anchored so the headband isn’t needed



Cochlear Implants

- Internal part is surgically implanted in the inner ear (cochlea).
- External speech processor attaches to the side of the head with a magnet
- Converts sound/acoustic energy to electrical signals to stimulate the auditory nerve and carry info to the brain

Keeping technology on little ears... (sometimes easier said than done!)

3 TIPS:

Distract: Draw their attention away from the device and to an activity

Adhesive: Medical or wig tape may help keep the device on when used appropriately

Hats: Use a hat or cap to discourage touching

IF your child insists on pulling their devices off, there could be an underlying problem, (MAYBE, not always!)...like earmolds that don't fit anymore...or ear infections causing discomfort or a map adjustment

Share all of your concerns about hearing device wear time with your interventionist and your audiologist.

Take 5... and grow your child's brain!



First thing in the morning, check your child's devices to make sure they're in working order. This means check the batteries and all other parts. Your audiologist can coach you in this process for your child's specific devices.



Get your child's hearing devices on their ears as soon as they are awake. If you're a hearing parent, you can hear all of the sounds around you the moment you wake up. Your child needs to hear your voice and all of the sounds of the home from the very first minute they are awake.



Do a quick listening check. You want to make sure that with the hearing devices checked and on their ears, your child can hear all of the sounds of speech available to him or her.

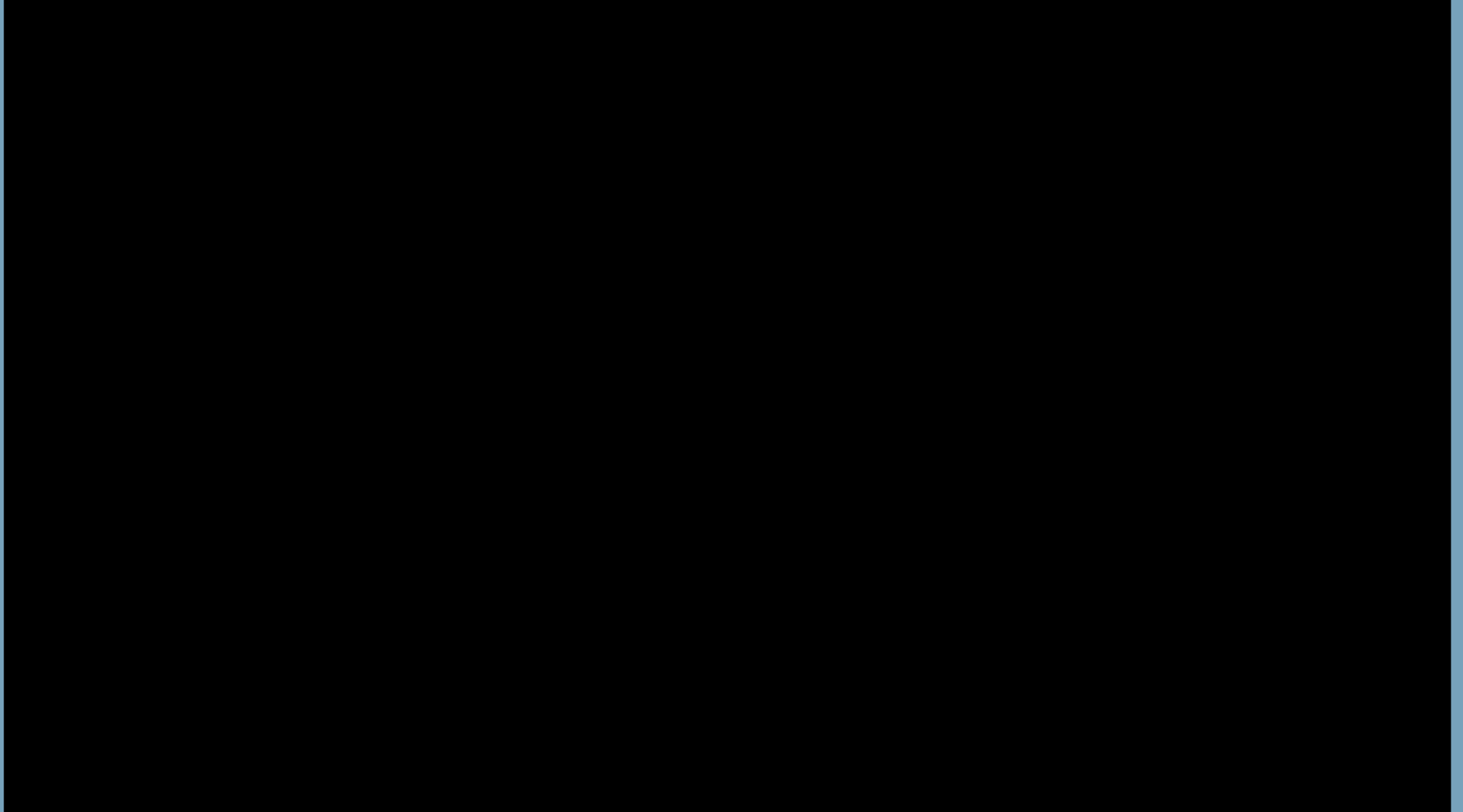
Why not a, e, i, o or u....or xyz ???

Ling 6 Sounds: low ('m' & 'oo') to high *frequency/pitch* ('sh' & 's')



If your child can hear all of the sounds, your child can probably hear you *spe****ak, sing, and read*** to them ... especially if the room is quiet and you are close by

Ling 6 sound Test



Questions about my child's hearing loss:

https://www.cdc.gov/ncbddd/hearingloss/freematerials/audiologist_questions_eng.pdf

- How much hearing loss does my child have? Please explain the terms: sensorineural, conductive, mixed, mild, moderate, severe, profound, and auditory neuropathy.
- Is the loss permanent? Does my child need more testing? How often should my child's hearing be tested?
- Can you tell me if my child's hearing loss will change or get worse?
- Do both ears have the same hearing loss?
- How will the hearing loss affect my child's speech and language development?
- What could have caused my child's hearing loss?
- Would you suggest genetic counseling for our family?
- Please explain the audiogram or the report.
- May I have a copy of the hearing test results?

Questions about technology for my child:

1. Does my child need a hearing aid? What are my choices? Should he or she have a hearing aid in both ears?
2. How much do hearing aids cost? Where can I get help to pay for the hearing aids?
3. Can you help me contact a program that can lend me hearing aids?
4. What can my child hear with the hearing aids? How do you test if the hearing aids are working just right for my child?
5. How many hours should my child wear the hearing aids?
6. Should my child wear the hearing aids when playing sport activities?
7. What should I do if my child loses his/her hearing aids?
8. What should I do if my child does not want to wear the hearing aid?
9. How often do you need to check or adjust the hearing aids?
10. How often will my child need new hearing aids?
11. Which part of a hearing aid (such as the earmold and tubing) will need to be replaced regularly?
12. What is the difference between a hearing aid and a cochlear implant?
13. Should I consider a cochlear implant (an electronic device placed under the skin behind the ear)? Where can I get more information?

Questions about communication options and education:

- What are communication options (such as total or oral communication, sign language)?
- When should I begin early intervention, speech or other therapy? What is available in my area?

Questions about support:

- Is there a parent group in my area? And who should I contact?
- Can you help me meet another parent with a child who has a hearing loss similar to my child's?
- Where can I look up more information about hearing loss?
- How do I describe the hearing test result to my family?
- Do you have tips for my family about how to communicate with my child at home?

Assistive Listening Devices

- A personal FM system

Parent/Teacher/Coach wears a mic which transmits directly to the device

Helps with hearing in noise—(reduces signal to noise ratio)

- Many families use in car, shopping, restaurants, daycare/school

- A sound field system

Usually used in a classroom

Teacher wears mic and voice is amplified throughout the room; May have “pass around” mic

Helps with hearing in noise

- Other ALDs

Connect to computers, smart phones, and TVs; may be permanent like inductive loop systems and infrared systems, installed in large facilities

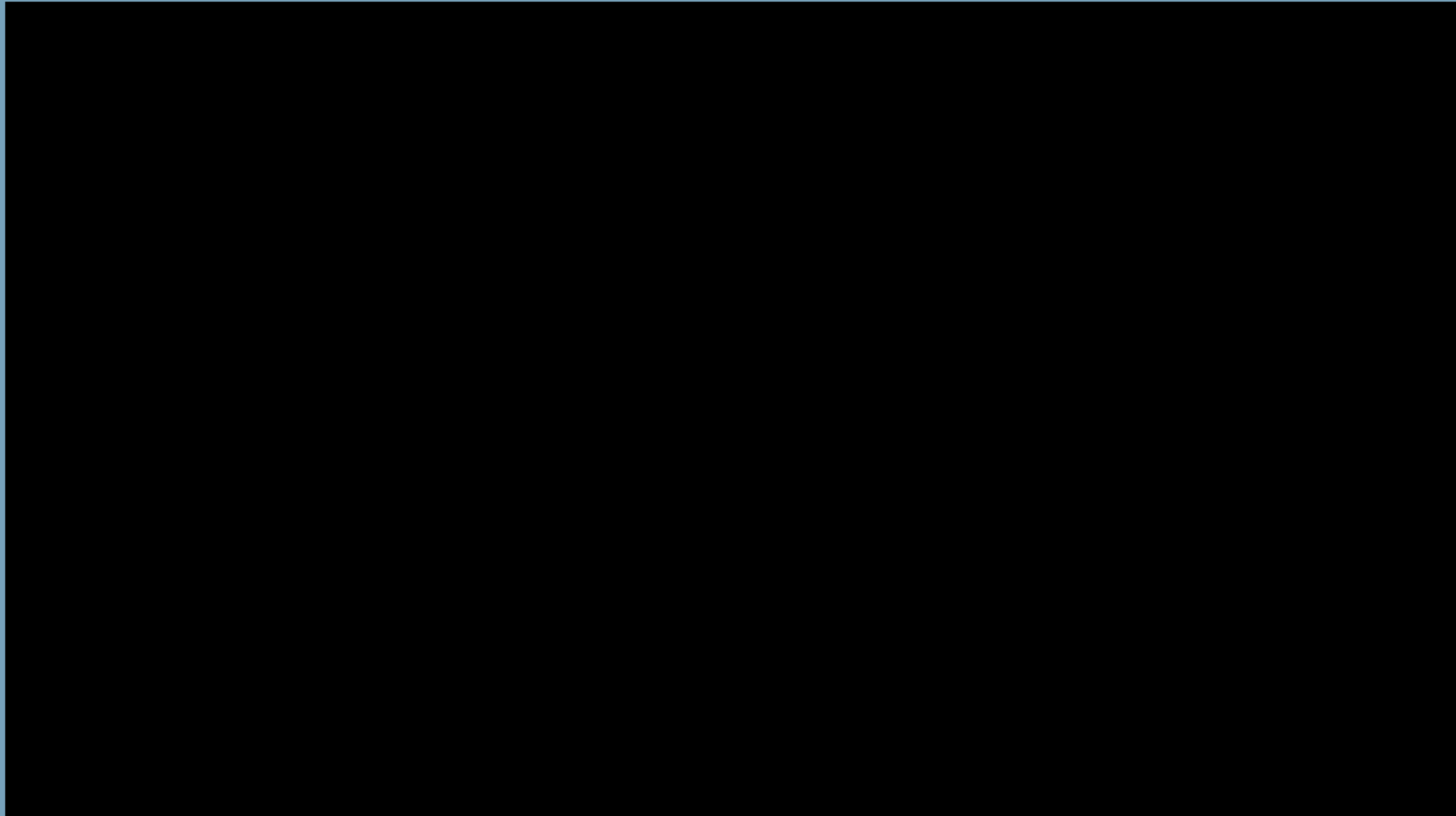
FM example:

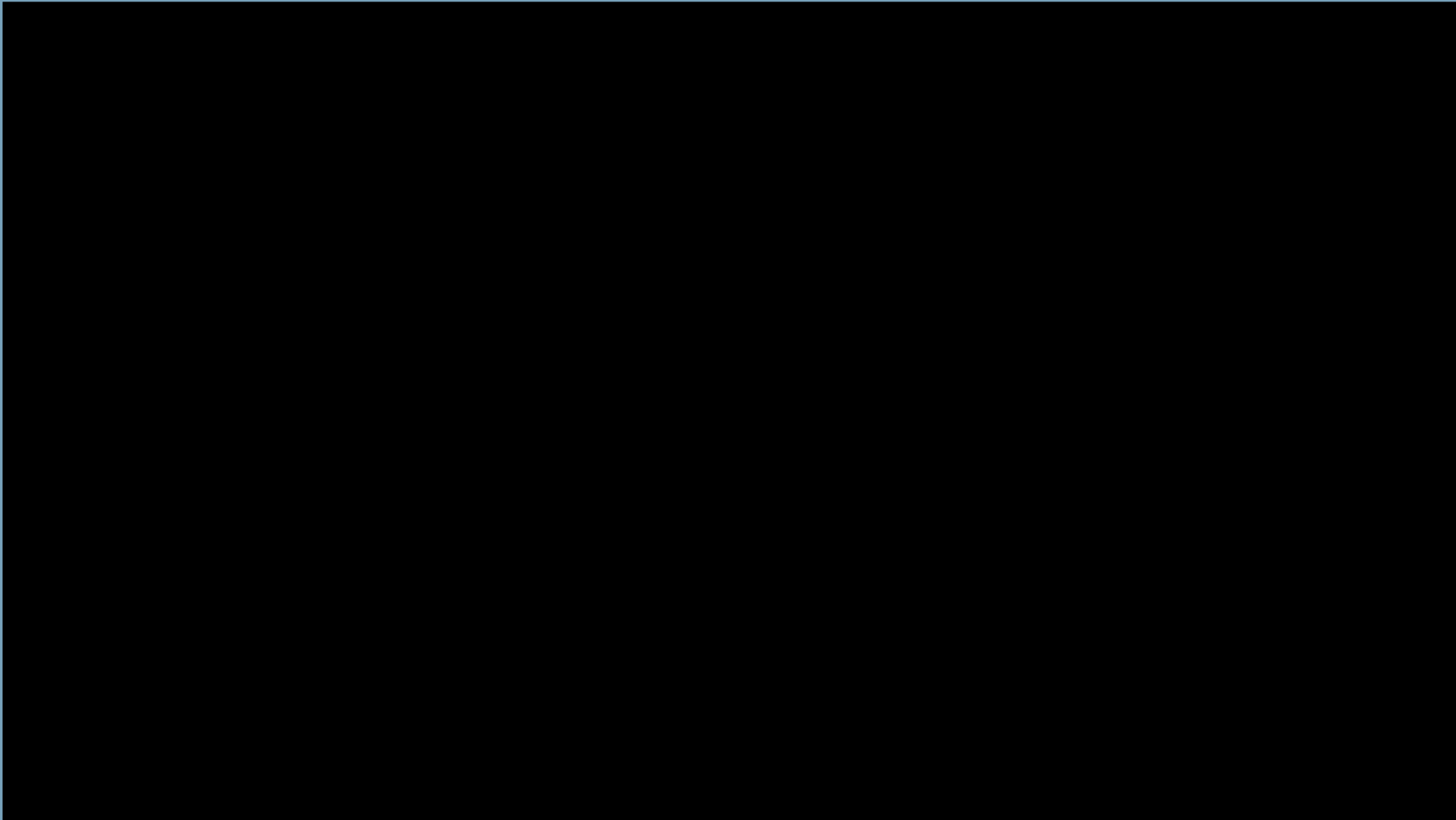


Start 1:55

FM Demo:

<https://www.bing.com/videos/search?q=vermont+FM+demonstration&&FORM=VDVXX>





Audiologists don't go home with you... (and other tweetables)

- Audiologists don't go home with you...
- Technology never works in the drawer...
- Find your village...
- Old dogs can learn new tricks...
- There's always a better mousetrap just around the corner...



Questions?

the world needs
what you've got.



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