

Audiology 101

Rose Dockery Au.D., CCC-A

Rose Dockery, Au.D., CCC-A

Audiologist

Yukon-Kuskokwim Health Corporation

Specialty Services-Audiology

907.543.6473

Fax 907.543.6411

PO Box 287, Bethel AK 99559

Justin Warren

Medical Support Technician II

Yukon-Kuskokwim Health Corporation

Audiology Clinic

P.O. Box 258, Bethel, Alaska 99559

(P) 907.543.6490 (F) 907.543.6487

www.ykhc.org

YKHC Audiology



Audiology
Review



Cases



Referrals &
Questions

Audiology and ENT

Audiograms

Otoscopy

Tympanometry

Telemed

Audiology Scope of Practice

- **Identification** Audiologists develop and oversee hearing and speech and language screening programs
- **Assessment, diagnosis and audiologic treatment** for persons with impairment of hearing and vestibular function.
- Audiologists conduct otoscopic examinations, clean ear canals and remove cerumen, take ear canal impressions.
- The audiologist provides pre and post surgical assessment and counseling for cochlear implants and bone anchored hearing aids. Provide programming, and maintenance of implant hardware and software.

Audiology Scope of Practice

- **Counseling** regarding tinnitus, hearing loss, amplification systems and strategies for improving speech recognition
- **Hearing Conservation** for industrial and community hearing conservation programs.
- **Intraoperative Neurophysiologic Monitoring** Audiologists administer and interpret electrophysiologic measurements of neural function including, but not limited to, sensory and motor evoked potentials, tests of nerve conduction velocity and electromyography.
- **Research** Audiologists design, implement, analyze and interpret the results of research related to auditory and balance systems.

YK Audiology Services

- Hearing screenings
- Hearing evaluations (ABR (natural sleep), VRA, OAE and conventional)
- Telemed/ AFHCAN
- Cerumen Management
- Bone Anchored Hearing Aids and Cochlear Implant programming - Anchorage
- Intraoperative Monitoring –Anchorage
- Vestibular Screenings
- Vestibular Evaluation-Anchorage

Newborn Hearing Screenings

- 5% average referral rate - Alaska
- YK NBHS referrals rate -15%
- Many “slip through the cracks”.....Well Child Checkup



Audiology Refresher



YUKON-KUSKOKWIM HEALTH CORPORATION

PCC Audiology Record

APL DIS Initials/Code

Primary Provider

Problem List Update (Enter problem numbers from Health Summary)

Remove	Move to Inactive	Move to Active
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Pain Assessment

FLACC for non-verbal patients. See reverse side of form

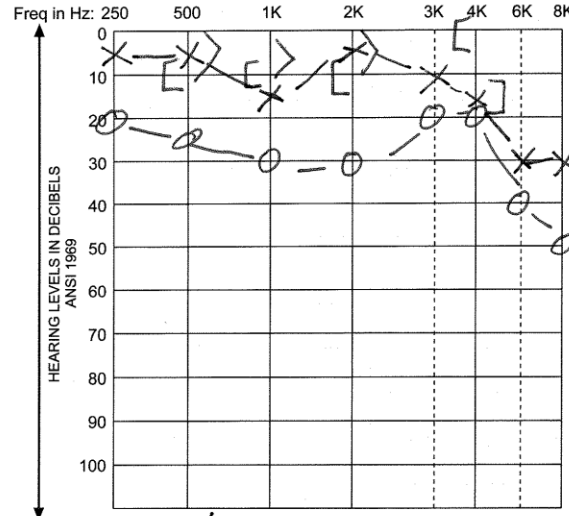
Score: _____

1 have no pain Ainiimaaq	1 have little pain Elleee ainiimaaq	1 have moderate pain Ainiimaaq	1 have much pain Caleeq ainiimaaq	1 have severe pain Nangtepaq	1 have very severe pain Nangtepaq

Arrival Time: 10:27 Clinic: Audiology

Do you feel safe at home? ☐ Yes ☐ No ☐ DV Referral to: _____

Do you feel depressed? ☐ Yes ☐ No Least 1 2 3 4 5 Most



SPEECH AUDIOMETRY

Ear	SRT	SAT	MCL	UCL	Speech Discrimination	SL	HTL
Right	20				100% 65 dB	%	dB
Left	10				100% 50 dB	%	dB
Binaural					% dB	%	dB
Unaided (SF)					% dB	%	dB
Aided (SF)					% dB	%	dB
List used	<input type="checkbox"/> LV <input type="checkbox"/> Tape						

IMPEDANCE TESTING

Inserts	TD#	TYPE	PRES	C. VOL	UNITS	ACOUSTIC REFLEX
<input type="checkbox"/>	<input checked="" type="checkbox"/>	RT	B	NP 1.0	NP	DNT
		LT	A	50 1.0	.3	DNT

AUDIOGRAM

KEY	RED	BLUE	NO RESPONSE
Air Conduction	O	X	
Masked Air	Δ	□	
Bone Conduction	<	>	
Masked Bone	□	□	

COUNSELED REGARDING

<input checked="" type="checkbox"/> Hearing Loss	Amplification
<input checked="" type="checkbox"/> Otitis Media	Tinnitus
Ear Tubes	Vertigo
Dry Ear Care	Cerumen
Noise Protection	Ear Drops
Battery Safety	Valsalva

Type of Test: ☒ Reg. ☐ Play ☐ VRA ☐ BEH

☐ Other _____

Reliability: ☒ Good ☐ Fair ☐ Poor

Chief Complaint: History of O.M. (right). History of PE tubes (AU)
No recent drainage, or dizziness. Otalgia - Right
from time to time.

Procedures: Otосcopy clear + dry canals AU.

Audiometry - (L) WNL 250 Hz - 4000 Hz sloping to mild CHL at 6000 Hz + 8000 Hz.
(R) WNL to mild CHL 250 Hz - 4000 Hz sloping to mod. CHL at 6000 Hz + 8000 Hz.

Problem List Purpose of Visit / Diagnosis (Print only in this section.)

A-AI-C	#	Purpose of Visit / Diagnosis
		<u>Hearing test</u>
		<u>CHL + AU</u>
		Store plan to problem #

588-2588 - Mom

Plan: follow ENT telemed suggestions

☐ Medication Reconciliation Form completed

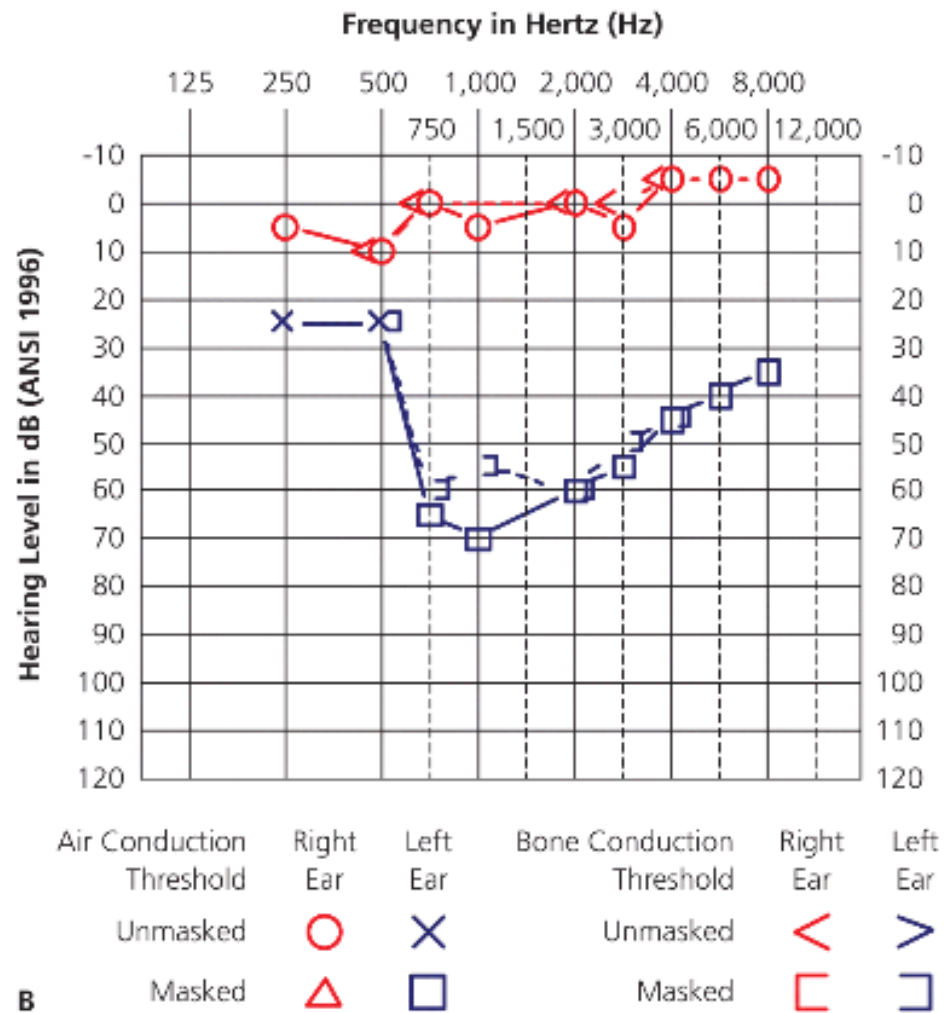
Readiness to Learn: 1 2 3 4 5 6 7 | Eval. of Learning: 1 2 3 4 5 (Key on back side of form)

YK Audiogram

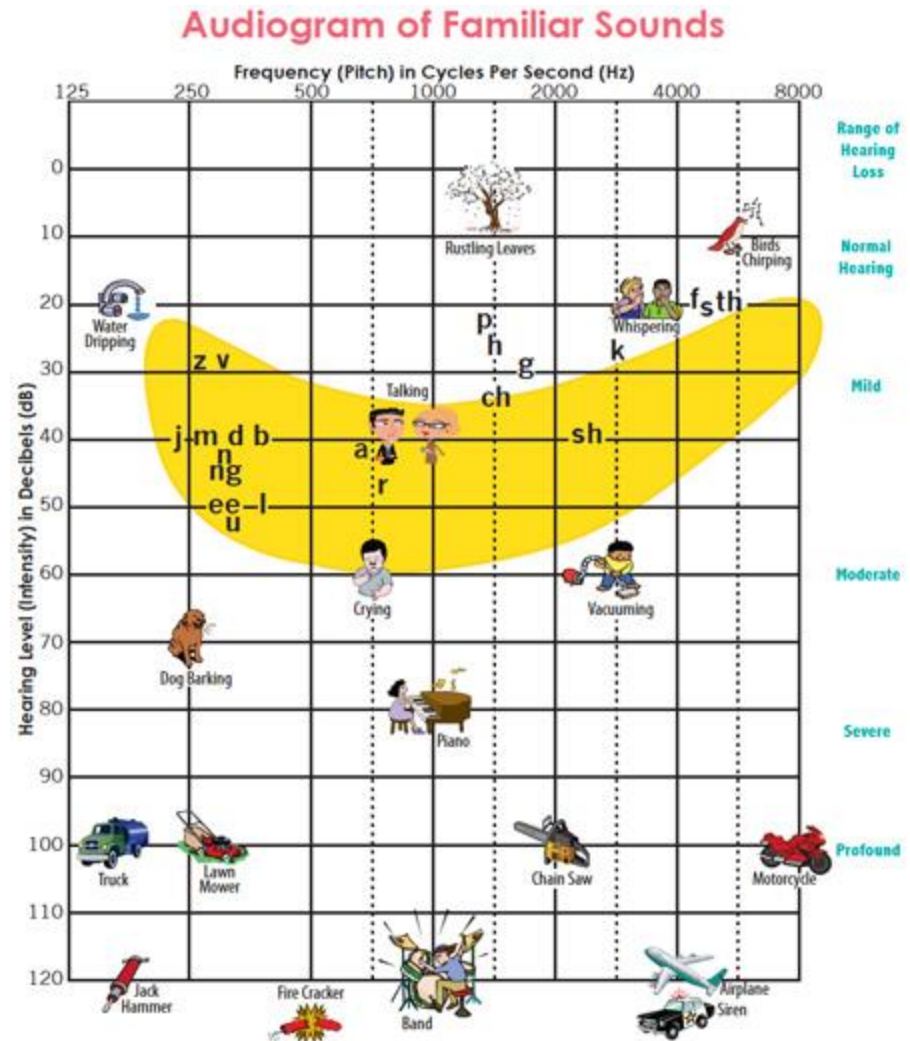
Audiograms include the following depending on the patient:

- Otoscopic Exam
- Pure-tone Audiometry (air and bone)
- Speech Audiometry (bone as needed)
- Tympanometry (not completed on mastoid bowls)
- Acoustic Reflex screener
- Distortion Product Otoacoustic Emissions Screener (children or malingerer)

Audiogram



- Hearing Loss is described as a range (mild-profound)
- 25 dB is the “normal cutoff”



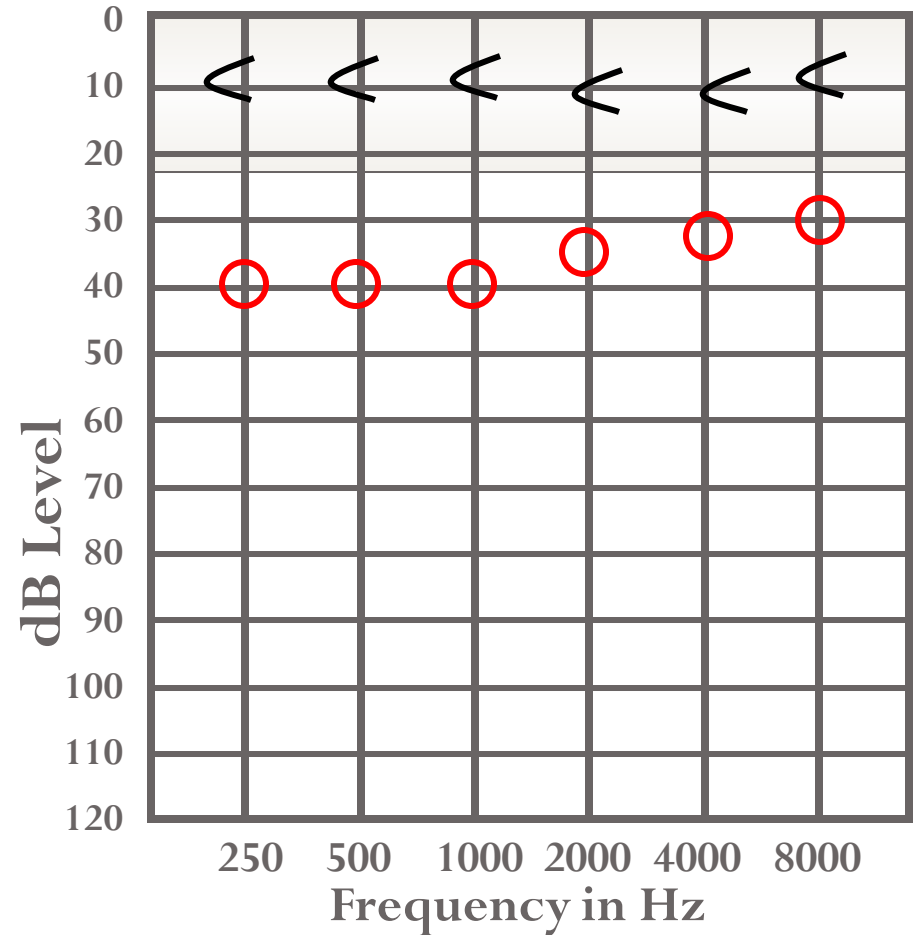
Adapted from: American Academy of Audiology, www.audiology.org and Northern, J. & Downs, M. (2002). Audiogram of familiar sounds; and Ling, D. & Ling, A. (1970). Aural Habilitation.

There are 3 types of hearing loss

- Conductive (CHL)
- Sensorineural (SNHL)
- Mixed ~ Both Conductive and Sensorineural

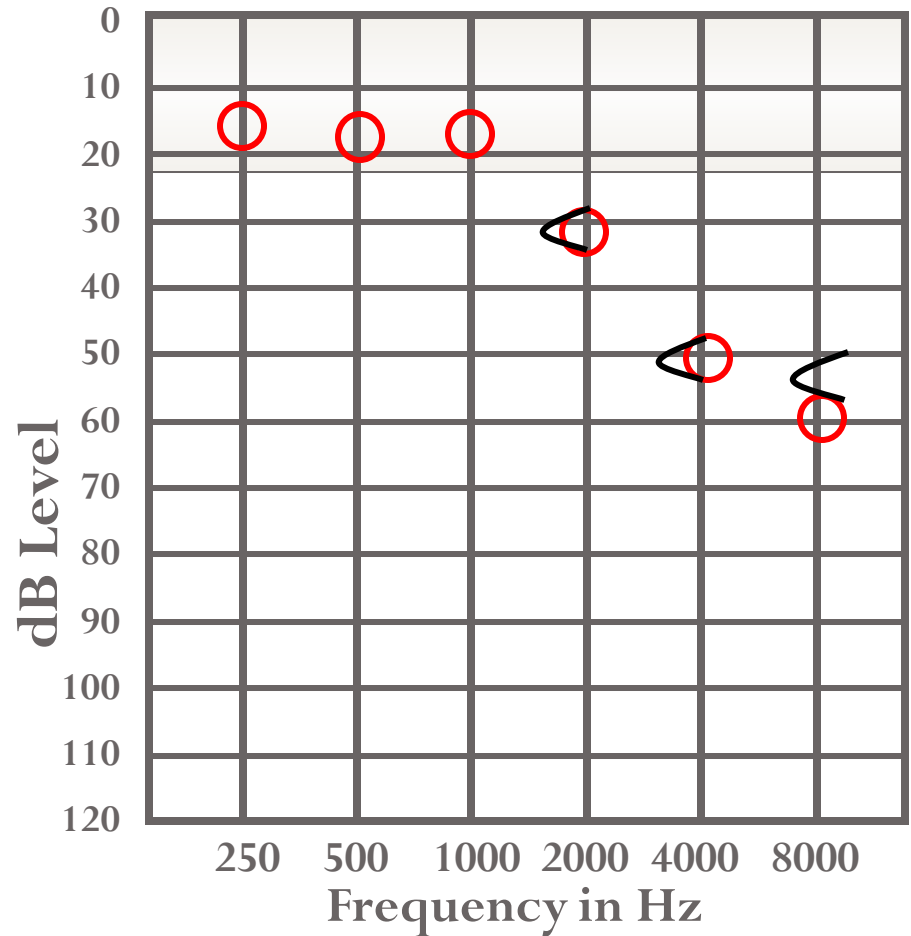
Conductive Hearing Loss

- Caused by damage to the outer or middle ear
- Bone conduction is within the normal range, air Conduction is not
- **Many YK kids**



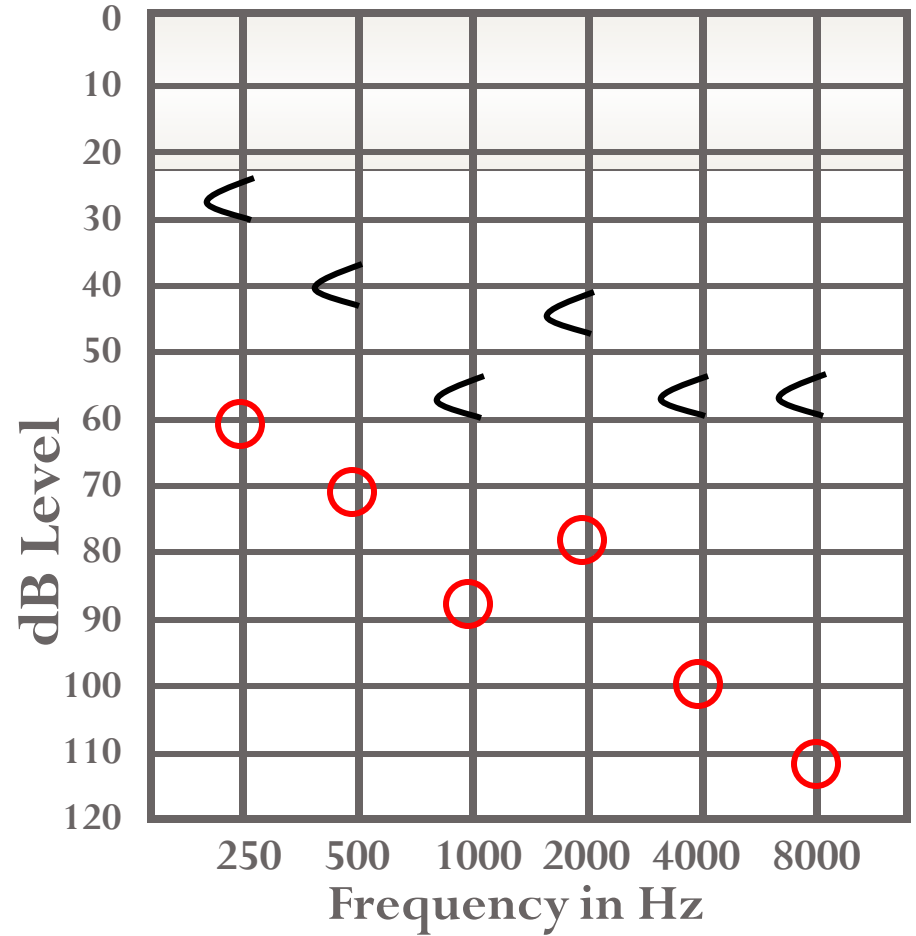
Sensorineural Hearing loss

- Damage to the Cochlea or beyond
- Aging
- Loud noise Exposure
- Ototoxic Medications



Mixed Hearing Loss

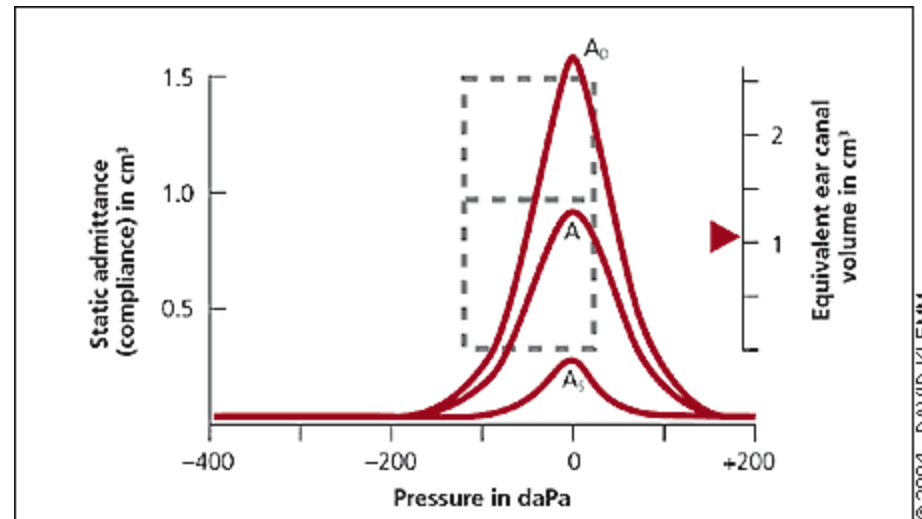
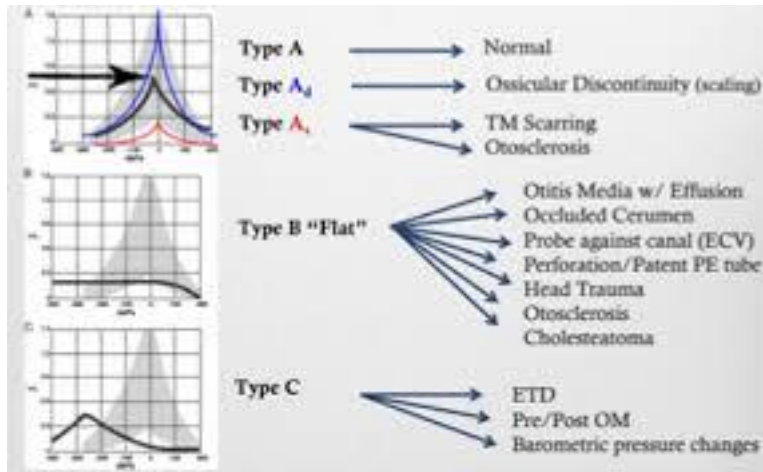
- Has both conductive and sensorineural components



Tympanometry

- Tympanometry provides objective measurements to determine status of middle ear function
- Can be performed on all ages, infant to adult
- **Is there a perforation, patent PE tube or pressure?**

Tympanometry



Case Studies

Case Study 1

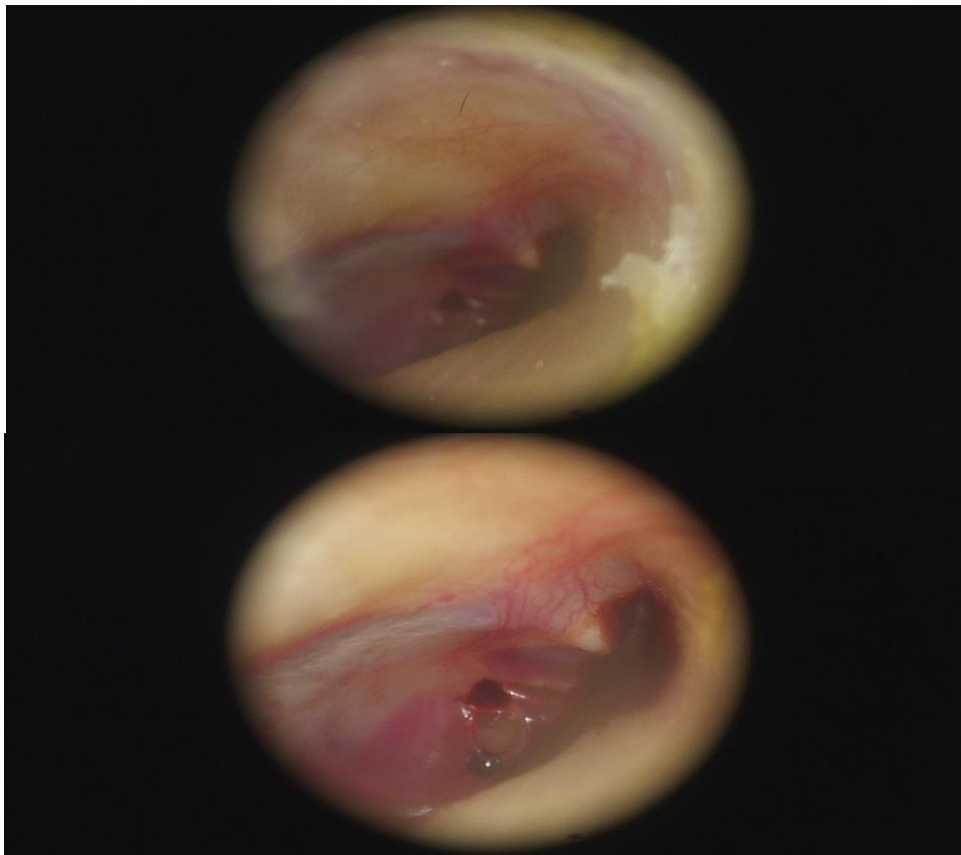
- 28 y/o female was seen in audiology clinic from ED for possible TM perf in right ear. She reported being hit on right side of face with a open hand. She reported otalgia-AU. Denied tinnitus. She was not prescribed any medication in E.D.
- Otoscopy-Left Dry and clear ear canal with intact TM. Right ear canal is red and there appears to be a perf in TM
- Tympanometry: Right-could not obtain seal
Left C graph -270 daPa 1.2 ml ECV .6ml compliance.
- Audiometry: Left WNL 250 Hz to 8000 Hz.
Right WNL 250 Hz-6000 Hz sloping to mild CHL at 8000 Hz.

Plan: CO is interested in TM repair if possible. She asked about pain reliever for ear. (01/11/2019 5:07 PM)

Otoscopy




AS



AD

Audiogram



**YUKON-KUSKOKWIM
HEALTH CORPORATION**

**PCC Audiology
Record**

Problem List Update (Enter problem numbers from Health Summary)

Remove	Move to Inactive	Move to Active
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Pain Assessment
FLACC for non-verbal patients. See reverse side of form
Score: _____

Primary Provider

APL	UTS	INITIALS/DOB

Arrival Time: 1405 Clinic: Audiology

Do you feel safe at home? ☐ Yes ☐ No ☐ DV Referral to: _____

Do you feel depressed? ☐ Yes ☐ No ☐ Least 1 2 3 4 5 Most

Speech Audiometry

Ear	SRT	SAT	MCL	UCL	Speech Discrimination	SL	HTL
Right	<u>10</u>				<u>100%</u>	<u>50</u>	
Left	<u>15</u>				<u>100%</u>	<u>50</u>	
Binaural							
Unaided (SF)							
Aided (SF)							

List used ☐ LV ☐ Tape

IMPEDANCE TESTING

Inserts	TD#	TYPE	PRES	C. VOL	UNITS	ACOUSTIC REFLEX
	<u>X</u>					
RT		<u>Could not obtain seal</u>				
LT		<u>C</u>	<u>-270 dBS</u>	<u>1.2 ml</u>	<u>.6 ml</u>	<u>Present</u>

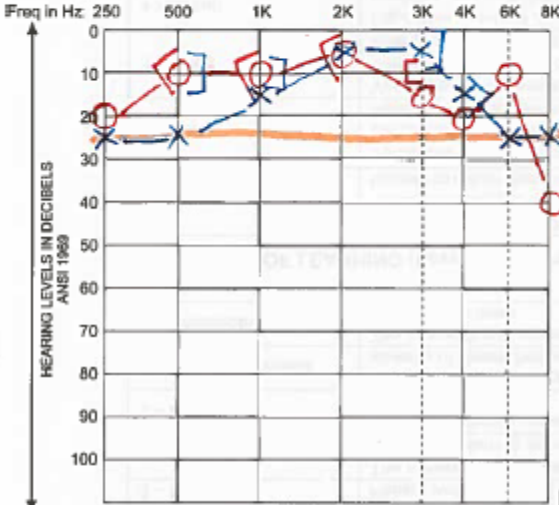
AUDIOGRAM

KEY	RED	BLUE	NO RESPONSE
Air Conduction	<u>O</u>	<u>X</u>	<u>X</u>
Masked Air	<u><</u>	<u><</u>	<u><</u>
Bone Conduction	<u><</u>	<u><</u>	<u><</u>
Masked Bone	<u><</u>	<u><</u>	<u><</u>

COUNSELED REGARDING

<input checked="" type="checkbox"/> Hearing Loss	<input type="checkbox"/> Amplification
<input type="checkbox"/> Otitis Media	<input type="checkbox"/> Tinnitus
<input type="checkbox"/> Ear Tubes	<input type="checkbox"/> Vertigo
<input type="checkbox"/> Dry Ear Care	<input type="checkbox"/> Cerumen
<input type="checkbox"/> Noise Protection	<input type="checkbox"/> Ear Drops
<input type="checkbox"/> Battery Safety	<input type="checkbox"/> Valsalva

HEARING LEVELS IN DECIBELS
ANSI 1969



Type of Test: ☒ Reg. ☐ Play ☐ VRA ☐ BEH
☐ Other _____

Reliability: ☒ Good ☐ Fair ☐ Poor

Chief Complaint: Otalgia - All. No history of ear infection.
Denies drainage + tinnitus. Reported dizziness that is not
constant lasting only for a few seconds. CO was slapped/hit (right ear) with an open
hand.

Procedures: Otoscopy: Left dry + clean ear canal Right: Red + wet canal
Audiometry: Left hearing WNL 250Hz - 8000Hz. Right Hearing WNL 250Hz -
6000 Hz sloping to mild CAL at 8000 Hz

Problem List	Purpose of Visit / Diagnosis (Print only in this section.)
<u>5916800</u>	<u>Hearing test</u>
	<u>ENT Telemed Case Creation</u>

Plan: Follow ENT physician recommendation

ANMC ENT Response

I wish this would have happened yesterday when I was in Bethel. Not much to do in the acute period. Ibuprofen and Tylenol for pain. For the TM rupture, give ofloxacin drops, 4 drops BID X 1 week. Either Bear or I can see her in March or April. *(01 / 11 / 2019 5:15 PM)*

Case Study 2

- Father mentioned seeing Dr. Kokesch in the past.

8 year old Customer presented to clinic with his father for a audiology follow-up. He has a history of chronic OM, CHL and PE tubes. Father reported that ear last drained December 2018. Denied dizziness, otalgia and tinnitus.

Last ear prescription written 6/5/2018 for ofloxacin 5 drops BID

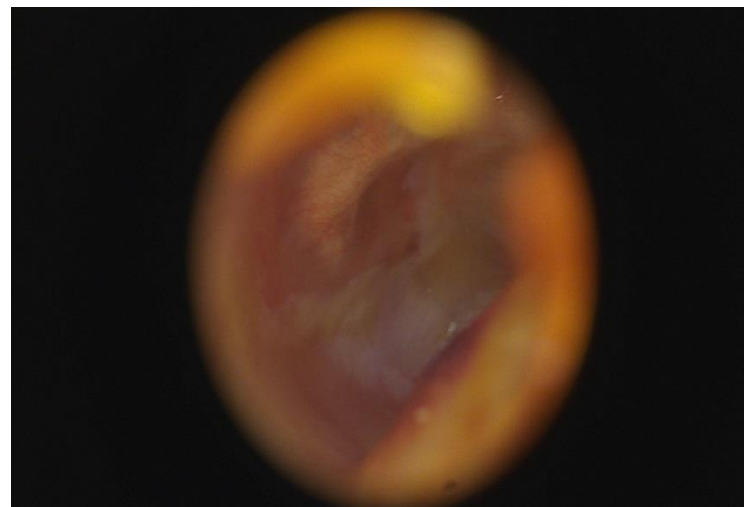
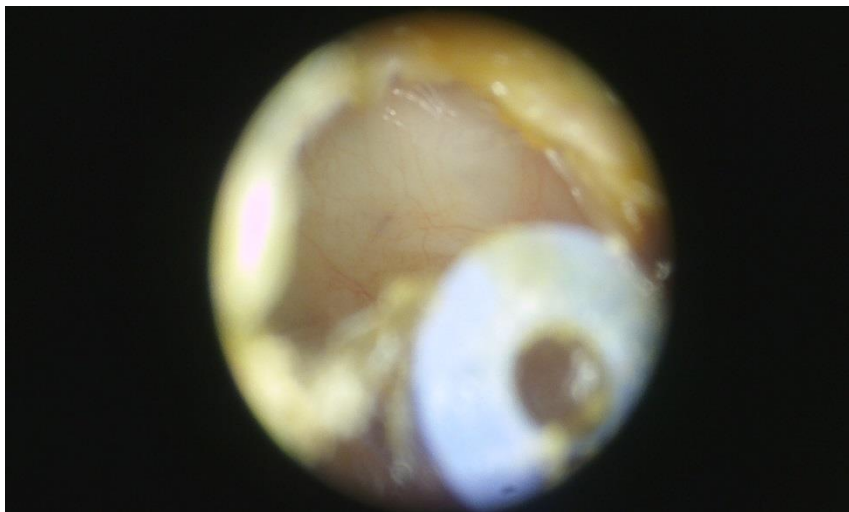
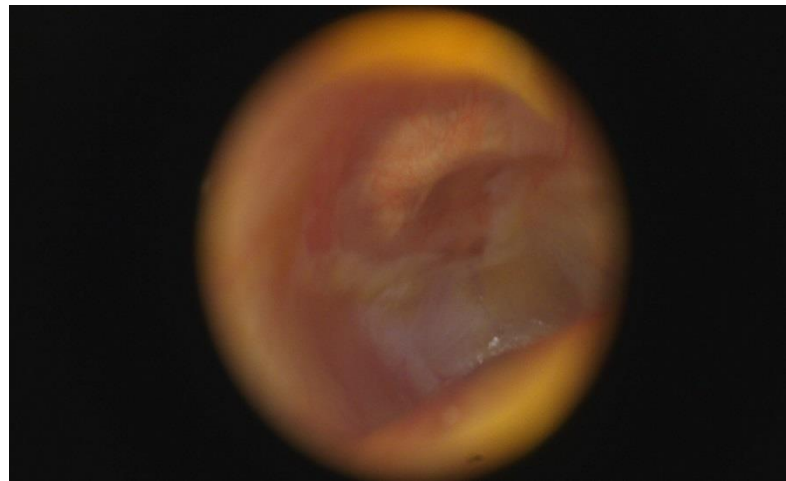
Tympanometry

Right: A graph, -80 daPa, .5ml ECV, .7 ml Compliance

Left: B graph 1.3 ml ECV No peaks

Plan: Please let me know the next step for this customer.

(01/17/2019 10:00 AM)



AS

AD

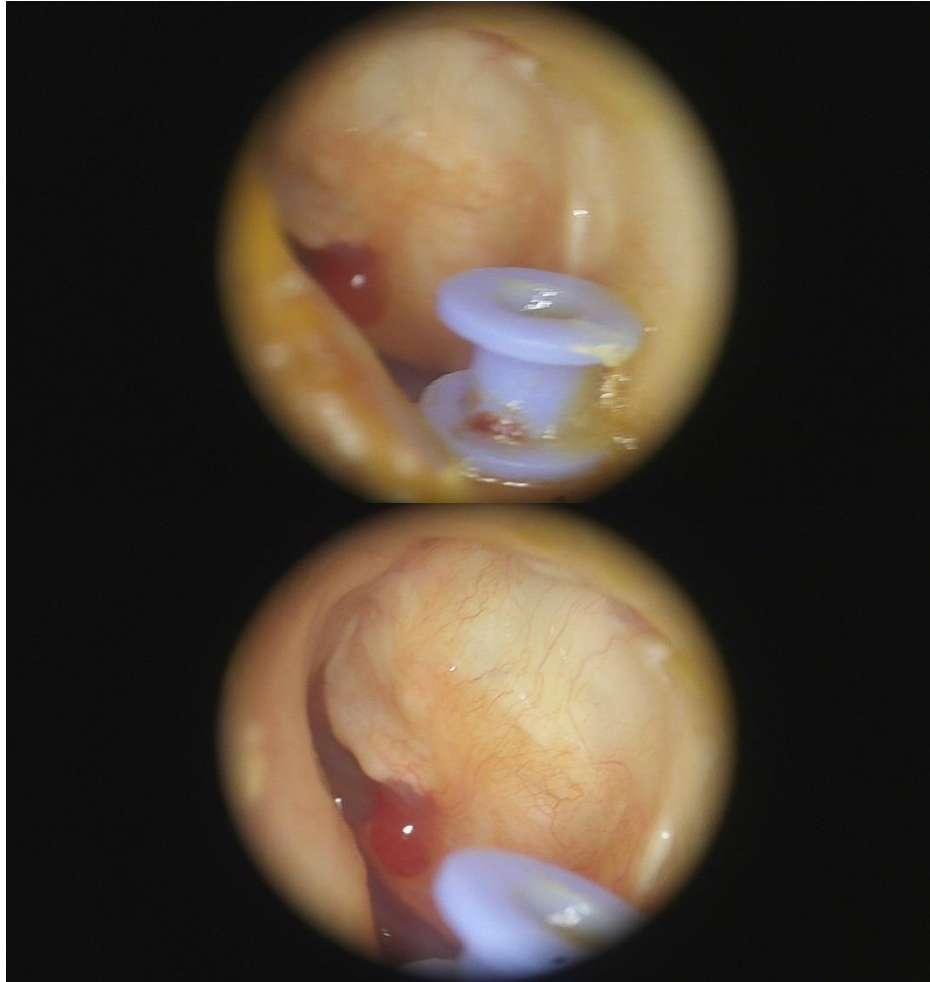
ENT Response

- Hi Rose! I reviewed his records and Conner has a history of a congenital cholesteatoma of the left ear. His last surgery for this was in March 2017 at which time he had a left revision tympanoplasty. He has also had right tympanostomy tubes placed in the past. The images of the left ear are concerning as it appears he may have reperforation this ear.
- Both ears appear infected.

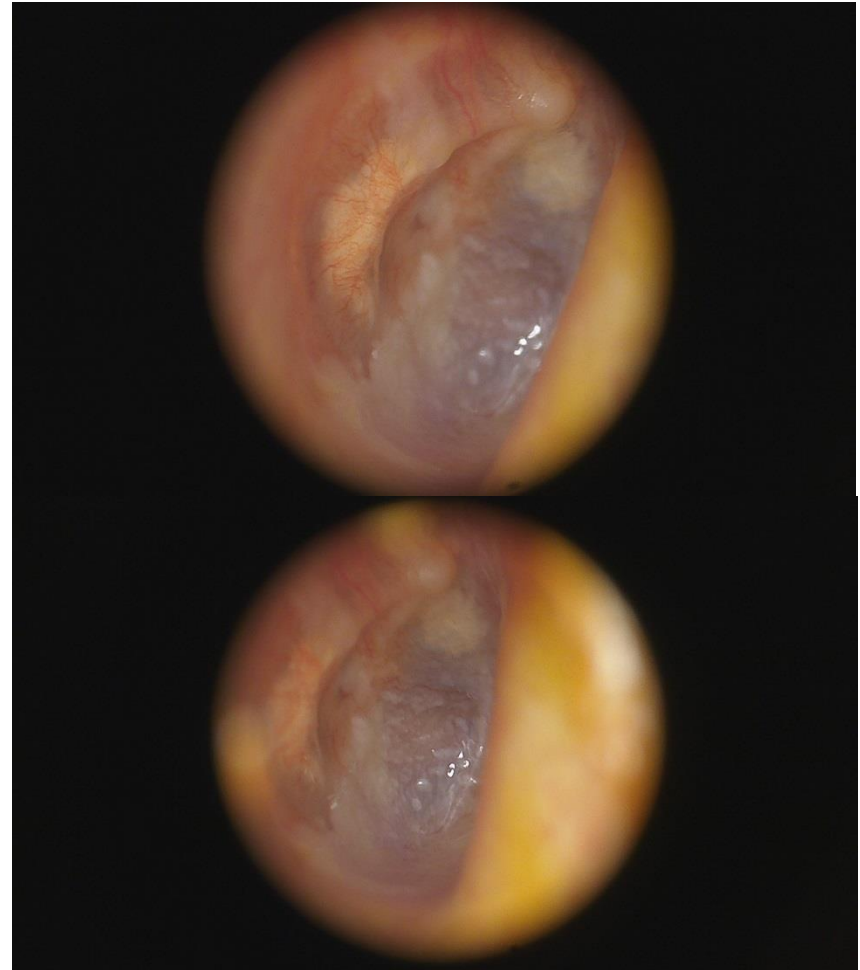
ENT Response

- I would recommend treating both with Floxin Otic drops, 5 drops twice daily for 7 days. The each ear should be cleaned carefully using a rolled up tissue prior to drop application to try to remove as much fluid and debris from the ear canal before the drops are placed. This will allow the drops to enter the middle ear space where they condition good.
- Please send us another set of images at some point after treatment, for example in about a month. He should keep all water and moisture out of both ears. **Fortunately, his hearing looks reasonably good. I could be wrong about the left ear, and I could be seeing a fluid meniscus. We should be able to tell what is going on when use and the next set of images. Thank you (01/17/2019 10:28 AM)

Yesterday's Otoscopy



AS



AD

Yesterday's ENT Response

- I reviewed this case, 8yM s/p left tymp-mastoid for large congenital cholesteatoma, 2nd look with no e/o recurrent disease (TORP and tube placed) 3/2017 (Kokesh). Last ENT contact was telemed 1/2019, a course of Floxin gtt AU was recommended.

Today's images and tymps show

AS - extruded tube, cartilage graft tplasty, anterior perforation filled with small granulation tissue, moist-appearing anterior sulcus

AD - intact retracted TM

Recommendations:

- **dry ear precautions indefinitely**
- **Pred-Forte 4 drops to LEFT ear BID for 10 days (no need to wick - this is to treat the granulation)**
- **for ongoing eustachian tube dysfunction, Flonase 1 spray each nostril at bedtime until cleared by ENT**
- **agree pt should be seen at next ENT FC**

Thanks! (02/25/2019 5:39 PM)

Referrals-4 Queues

- **ENT External (ANMC ENT)**
- **ENT Internal (Field Clinic)**
- **Audiology External (ANMC Audiology)**
- **Audiology Internal (YK audiology)**

Referrals-4 Queues

ENT External:

- Tonsillectomy
- Other throat concerns
- Nose concerns
- PE tubes and OM that meet the following requirements: 3 or more well documented and separate AOM episodes in the past 6 months OR at least 4 well documented and separate AOM episodes in the past 12 months with at least 1 in the past 6 months. OR Otitis media with effusion defined as middle ear effusion that is present for at least three months.
- **ENT Internal (Field Clinic):**
- Used by YK audiologist and YK ENT scheduler to refer customers to ANMC ENT field clinic

Referrals-4 Queues

Audiology Internal:

- Perceived hearing loss
- Tinnitus
- Vertigo
- Initial and Recurrent OM of fewer than 3 episodes in past 6 months
- Tympanic Membrane Perforation
- Failed hearing screening

Audiology External:

- Used by YK audiologist to refer customers to ANMC audiology

Walk-ins

Most walk –ins can be served on the same day. Please contact Dr. Dockery or Justin Warren if you have an audiology walk-in request.

- Please check for duplicate referrals before creating a new referral. Submit only 1 referral per customer. Subsequent referrals will be submitted by the audiologist to ANMC ENT and vice versa as needed.
- If you have any questions, please email or call Dr. Dockery (6473) or Justin Warren (6403).

Next ENT Field Clinic

- Dr. J. Tokita
- March 5, 6 and 7
(Tuesday, Wednesday
& Thursday)

Questions?

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