CHALLENGING HEARING AID FITTING
PROGRESSIVE HEARING LOSS

DISCLOSURES

- Manager of Audiology @ Hackensack University Medical Center
- COO @ Hackensack Audiology and Hearing Aid Associates

HEALTH HISTORY

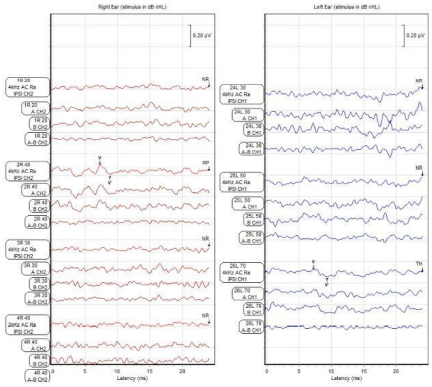
- Pregnancy was unremarkable.
- Birth was unremarkable on 12/29/2024.
- Did not pass newborn hearing screening @ outside facility.

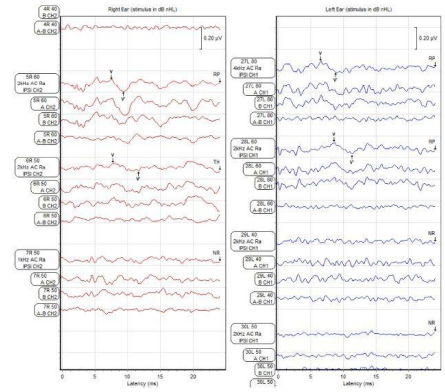
HEALTH HISTORY CONTINUED

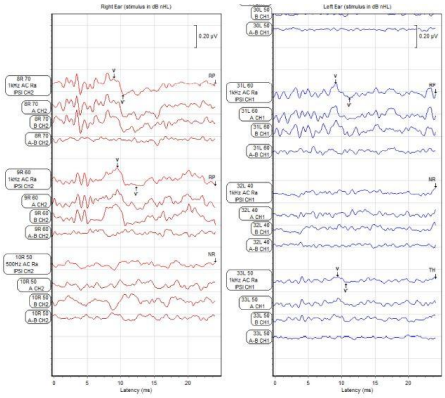
- Re-admitted on day 5 of life for hyperbilirubinemia requiring phototherapy.
- Suspected cCMV - IgG and Toxoplasma studies were negative.
- No family history of childhood onset hearing loss.

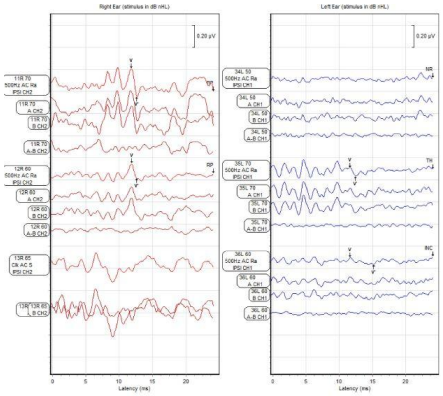
SEEKING SECOND OPINION

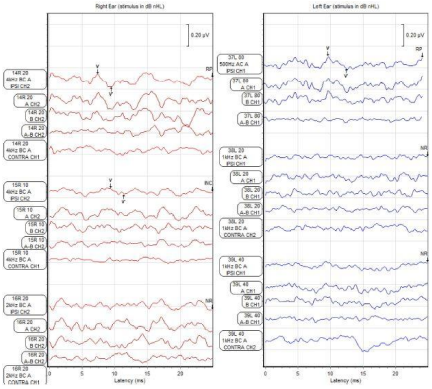
- 3 month old had diagnostic ABR at Birthing Facility on 3/7/2025.
- Right ear ABR demonstrated mild SNHL.
- Left ear ABR demonstrated a moderate SNHL.
- Family did not seek amplification yet

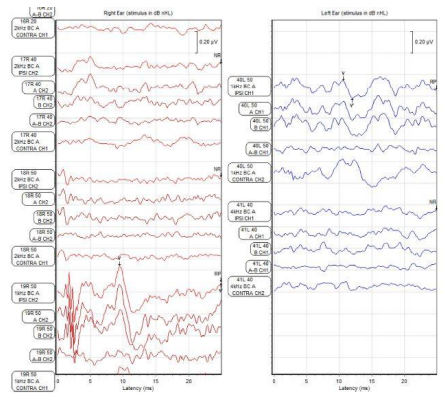


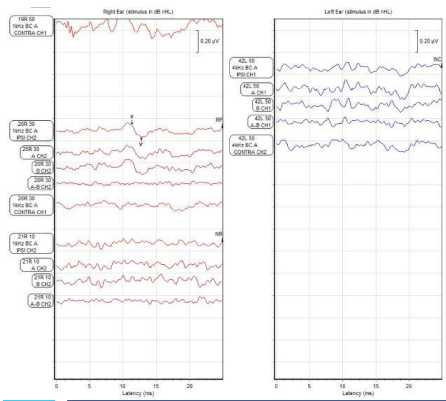












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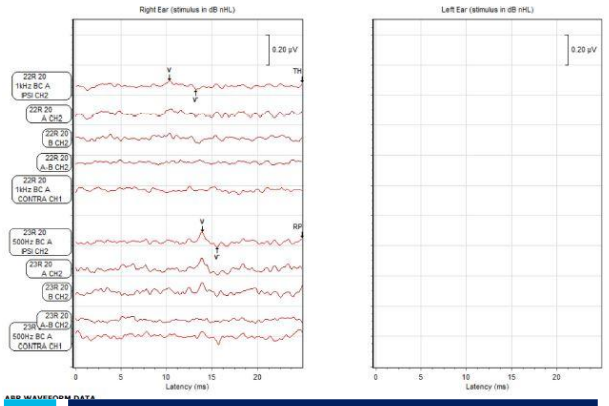

ABR WAVEFORM DATA

	Corr. Coef.	RN (µV)	SNR	Time (ms) I	I'	II	III	IV	V	V'	I-III	III-V	I-V	Amp (µV) I-I'	V-V'	Ratio (V-V')/(I-I')	SS	SE
1 R 20 CH2	—	0.007	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2 R 40 CH2	—	0.009	3.47	—	—	—	—	—	7.33	8.89	—	—	—	—	0.09	—	—	—
3 R 30 CH2	—	0.009	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4 R 40 CH2	—	0.010	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5 R 60 CH2	—	0.018	2.10	—	—	—	—	—	7.53	9.41	—	—	—	—	0.11	—	—	—
6 R 60 CH2	—	0.011	2.96	—	—	—	—	—	7.74	11.70	—	—	—	—	0.08	—	—	—
7 R 60 CH2	—	0.013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8 R 70 CH2	—	0.011	4.00	—	—	—	—	—	8.99	10.35	—	—	—	—	0.14	—	—	—
9 R 60 CH2	—	0.016	3.24	—	—	—	—	—	9.51	12.32	—	—	—	—	0.16	—	—	—
10 R 60 CH2	—	0.017	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11 R 70 CH2	—	0.025	3.46	—	—	—	—	—	11.80	12.64	—	—	—	—	0.25	—	—	—
12 R 60 CH2	—	0.012	3.37	—	—	—	—	—	11.91	12.64	—	—	—	—	0.13	—	—	—
13 R 66 CH2	—	0.046	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14 R 20 CH1	—	0.014	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15 R 20 CH2	—	0.016	2.81	—	—	—	—	—	7.40	9.48	—	—	—	—	0.11	—	—	—
16 R 10 CH1	—	0.007	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17 R 10 CH2	—	0.014	1.35	—	—	—	—	—	9.38	11.35	—	—	—	—	0.05	—	—	—
18 R 20 CH1	—	0.012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19 R 20 CH2	—	0.021	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20 R 40 CH1	—	0.016	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21 R 40 CH2	—	0.021	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22 R 60 CH1	—	0.012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23 R 60 CH2	—	0.013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24 R 60 CH1	—	0.025	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25 R 60 CH2	—	0.031	1.51	—	—	—	—	—	9.48	24.90	—	—	—	—	0.15	—	—	—
26 R 30 CH1	—	0.011	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27 R 30 CH2	—	0.009	4.16	—	—	—	—	—	11.35	12.81	—	—	—	—	0.10	—	—	—
28 R 10 CH2	—	0.008	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29 R 20 CH1	—	0.007	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30 R 20 CH2	—	0.007	2.61	—	—	—	—	—	10.31	13.23	—	—	—	—	0.05	—	—	—
31 R 20 CH1	—	0.010	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
32 R 20 CH2	—	0.011	3.93	—	—	—	—	—	13.96	15.62	—	—	—	—	0.09	—	—	—
33 R 80 CH1	—	0.012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
34 R 80 CH2	—	0.015	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35 R 79 CH1	—	0.009	3.04	—	—	—	—	—	7.22	9.30	—	—	—	—	0.07	—	—	—

Corr. Coef. = Correlation Coefficent, RN = Residual Noise

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Hackensack University
Medical Center

ABR WAVEFORM DATA

	Corr. Coef.	RN (µV)	SNR	Time (ms) I	I'	II	III	IV	V	V'	I-III	III-V	I-V	Amp (µV) I-I'	V-V'	Ratio (V-V')/(I-I')	SS	SE
27 L 80 CH1	—	0.012	3.31	—	—	—	—	—	6.49	8.78	—	—	—	—	0.10	—	—	—
28 L 60 CH1	—	0.011	4.14	—	—	—	—	—	8.58	11.28	—	—	—	—	0.11	—	—	—
29 L 40 CH1	—	0.014	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30 L 60 CH1	—	0.007	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31 L 60 CH1	—	0.015	2.79	—	—	—	—	—	9.10	11.18	—	—	—	—	0.12	—	—	—
32 L 40 CH1	—	0.009	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33 L 60 CH1	—	0.007	2.47	—	—	—	—	—	9.41	10.66	—	—	—	—	0.05	—	—	—
34 L 60 CH1	—	0.011	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35 L 70 CH1	—	0.007	3.33	—	—	—	—	—	11.60	12.43	—	—	—	—	0.07	—	—	—
36 L 80 CH1	—	0.008	2.61	—	—	—	—	—	11.60	15.14	—	—	—	—	0.06	—	—	—
37 L 80 CH1	—	0.010	3.71	—	—	—	—	—	9.62	12.43	—	—	—	—	0.11	—	—	—
38 L 20 CH1	—	0.012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
39 L 20 CH2	—	0.013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
40 L 40 CH1	—	0.012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41 L 40 CH2	—	0.016	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
42 L 60 CH1	—	0.015	4.35	—	—	—	—	—	10.62	11.98	—	—	—	—	0.15	—	—	—
43 L 60 CH2	—	0.017	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
44 L 40 CH1	—	0.013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
45 L 40 CH2	—	0.020	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46 L 60 CH1	—	0.018	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47 L 60 CH2	—	0.020	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Corr. Coef. = Correlation Coefficent, RN = Residual Noise

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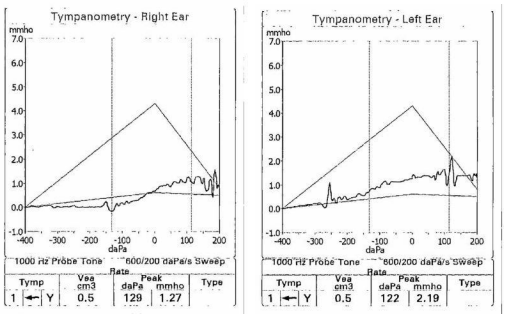
Test date: 4/23/2025
TympStar Pro, GS0062585



- No point of maximal tympanometric peak pressure or static compliance.
- OAEs not performed b/c of hearing loss, abnormal MEA, and time constraints.

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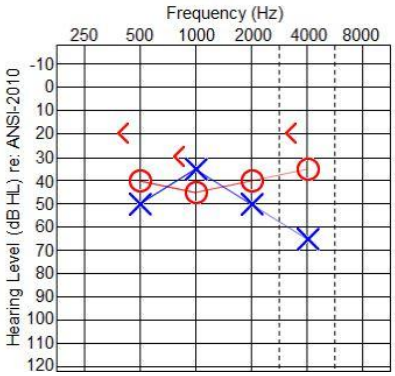
ESTIMATED AUDIOGRAM



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RECOMMENDATIONS - 4/23/2025

- F/U with ENT.
- Trial with HAs if expected to be long-standing or not ready to be managed medically/surgically.
  - Unaided SII - 28% right and 12% left (65 dB SPL)
- ABR re-evaluation in 3 months or per ENT.

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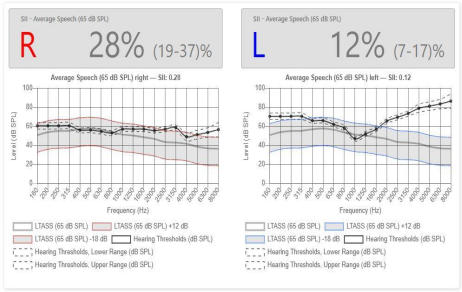
UNAIDED SII



Re-evaluation 7/2025

- Re-assessment prior to getting ENT clearance for HAs

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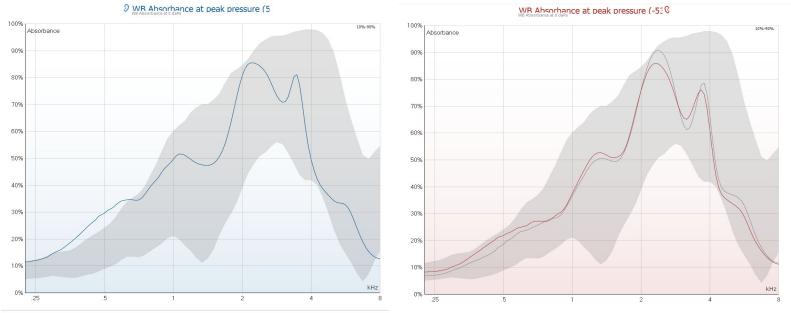
WIDE BAND ABSORBANCE AT PEAK PRESSURE



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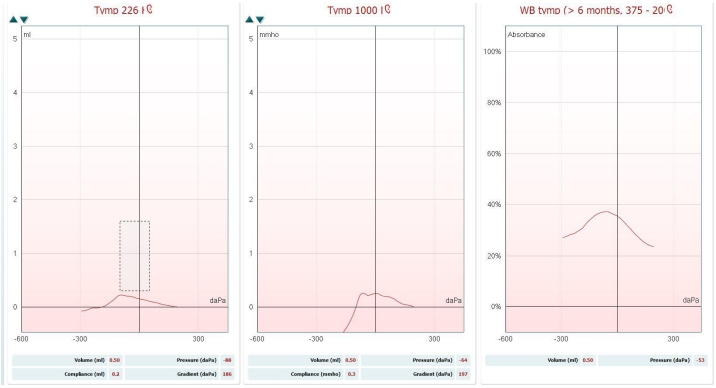

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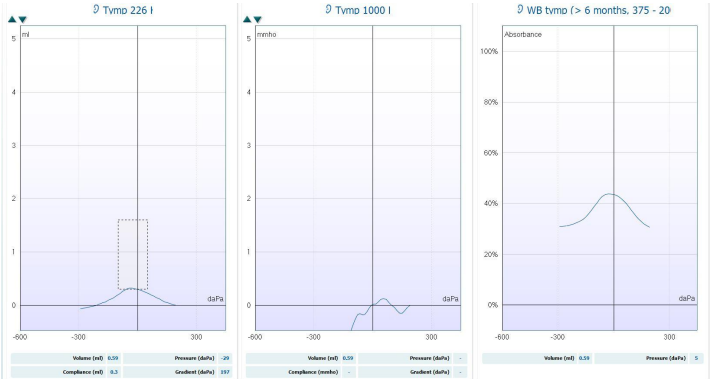

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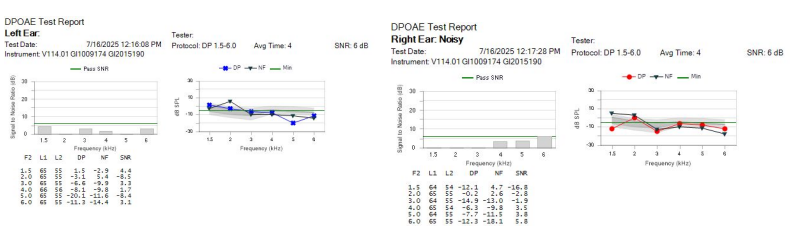
OTOACOUSTIC EMISSIONS



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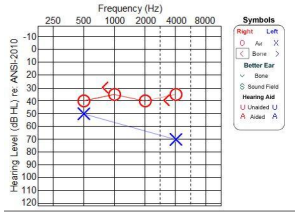
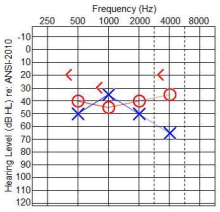
Estimated Audiogram 7/2025

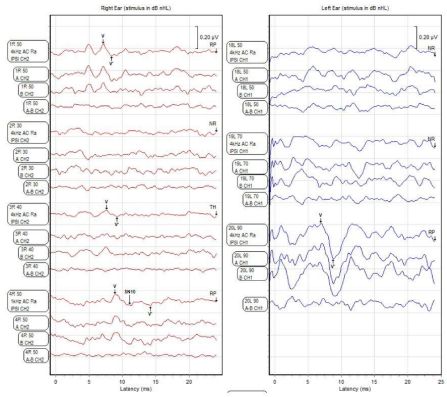


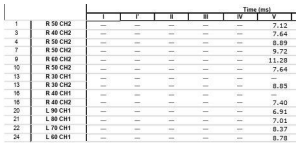
Estimated Audiogram 3/2025



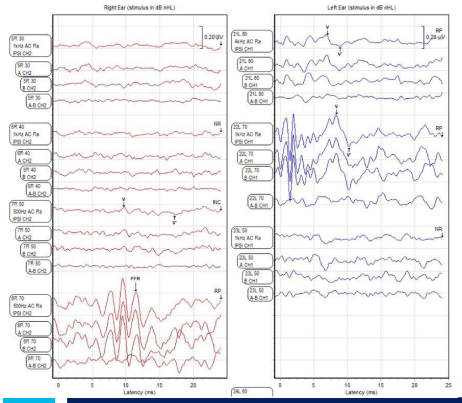
RE-EVALUATION 7/16/2025

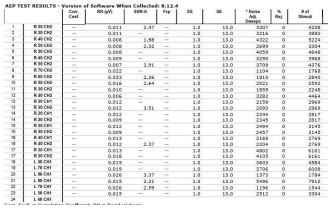
- Recommendations
  - Trial with amplification.
  - Genetics consultation



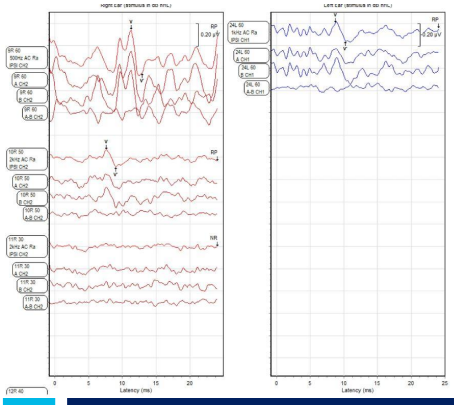


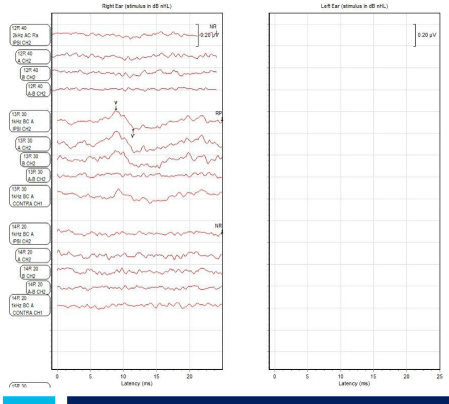
		Time (ms)					
		I	II	III	IV	V	
1	R 50 CH2	—	—	—	—	7.12	
3	R 40 CH2	—	—	—	—	7.64	
4	R 50 CH2	—	—	—	—	8.89	
7	R 50 CH2	—	—	—	—	9.72	
9	R 60 CH2	—	—	—	—	11.28	
10	R 50 CH2	—	—	—	—	7.64	
13	R 30 CH1	—	—	—	—	—	
13	R 30 CH2	—	—	—	—	8.85	
16	R 40 CH1	—	—	—	—	—	
16	R 40 CH2	—	—	—	—	7.40	
20	L 90 CH1	—	—	—	—	6.91	
21	L 80 CH1	—	—	—	—	7.01	
22	L 70 CH1	—	—	—	—	8.37	
24	L 60 CH1	—	—	—	—	8.78	

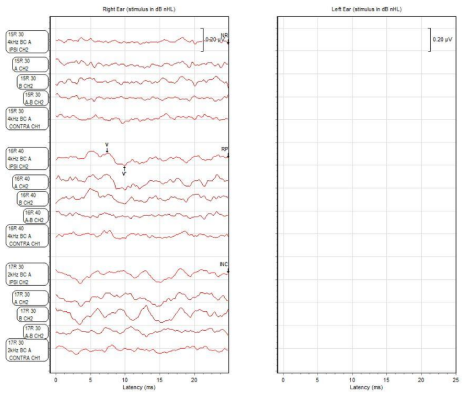




		Con. Cont.	Wt (μV)	SNR A	Pop	SS	SE	Noise Adj. Sweeps	% Rej.	# of Stimuli
1	R 50 CH2	—	0.011	2.47	—	1.0	13.0	3007	0	4208
2	R 50 CH2	—	0.011	—	—	1.0	13.0	3216	0	3890
3	R 40 CH2	—	0.008	1.98	—	1.0	13.0	4322	0	5224
4	R 50 CH2	—	0.008	2.32	—	1.0	13.0	2699	0	3304
5	R 30 CH2	—	0.010	—	—	1.0	13.0	4059	0	4948
6	R 40 CH2	—	0.009	—	—	1.0	13.0	3295	0	3968
7	R 50 CH2	—	0.007	2.91	—	1.0	13.0	3709	0	4576
8	R 70 CH2	—	0.022	—	—	1.0	13.0	1574	0	1744
9	R 60 CH2	—	0.013	2.36	—	1.0	13.0	2557	0	3140
10	R 50 CH2	—	0.016	2.64	—	1.0	13.0	2021	0	2592
11	R 30 CH2	—	0.010	—	—	1.0	13.0	1899	0	2248
12	R 40 CH2	—	0.006	—	—	1.0	13.0	3282	0	4464
13	R 30 CH1	—	0.012	—	—	1.0	13.0	2159	0	2969
13	R 30 CH2	—	0.012	3.51	—	1.0	13.0	2093	0	2969
14	R 30 CH2	—	0.013	—	—	1.0	13.0	2344	0	2817
15	R 40 CH2	—	0.012	—	—	1.0	13.0	2168	0	2769
16	R 50 CH2	—	0.013	—	—	1.0	13.0	2494	0	3145
16	R 30 CH2	—	0.009	—	—	1.0	13.0	2457	0	3145
18	R 40 CH2	—	0.013	—	—	1.0	13.0	2168	0	2769
18	R 40 CH2	—	0.012	2.27	—	1.0	13.0	2204	0	2769
17	R 30 CH1	—	0.013	—	—	1.0	13.0	4802	0	6161
17	R 30 CH2	—	0.018	—	—	1.0	13.0	4105	0	4161
18	L 70 CH1	—	0.033	—	—	1.0	13.0	3603	0	4984
18	L 70 CH2	—	0.029	—	—	1.0	13.0	3795	0	4984
20	L 90 CH1	—	0.016	3.37	—	1.0	13.0	4170	0	5304
21	L 80 CH1	—	0.015	2.31	—	1.0	13.0	5496	0	7912
22	L 70 CH1	—	0.026	2.99	—	1.0	13.0	1196	0	1544
23	L 50 CH1	—	0.015	—	—	1.0	13.0	2912	0	3304
24	L 60 CH1	—	—	—	—	—	—	—	—	—







FITTED WITH OTICON PX BTE HEARING AIDS

- Fitting to DSL 5.0 using simulated real-ear.
- Functional aided testing done via aided CAEP.
  - Good aided benefit /m/, /g/, /t/

    @ 65 dB SPL @ 1.5 meters

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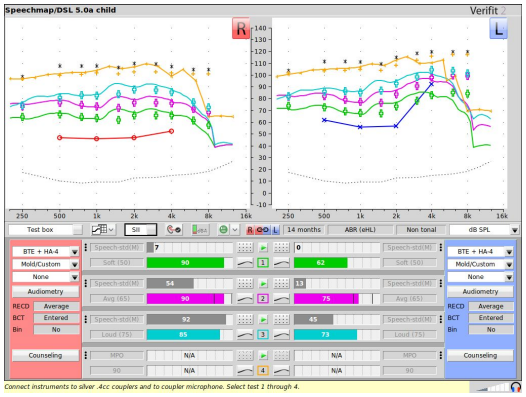

Simulated Real-Ear

RMSE		
	Right	Left
50 dB SPL	1.6	1.5
65 dB SPL	2.2	2.2
75 dB SPL	2.4	2.6

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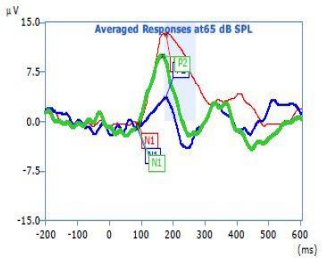
RIGHT AIDED CAEP RESPONSE



Latencies for responses at65 dB SPL (ms)

	/m/	/t/	/g/	/s/
P1				
N1	89	86	87	
P2	176	173	167	

Were client's responses to the stimuli presented significantly different from noise? (i.e. p <= 0.05)

	/m/	/t/	/g/	/s/
;5 dB SP	0.000	0.000	0.000	

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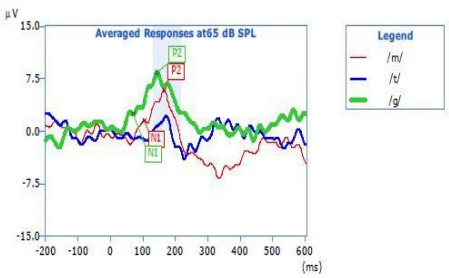
LEFT AIDED CAEP RESPONSE



Latencies for responses at65 dB SPL (ms)

	/m/	/t/	/g/	/s/
P1				
N1	104		68	
P2	164		143	

Were client's responses to the stimuli presented significantly different from noise? (i.e. p <= 0.05)

	/m/	/t/	/g/	/s/
;5 dB SP	0.000	0.110	0.002	

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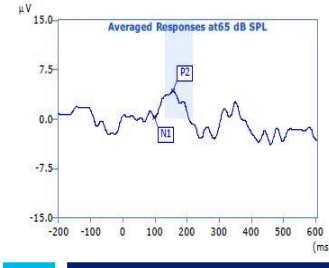
LEFT AIDED CAEP RESPONSE



Latencies for responses at65 dB SPL (ms)

	/m/	/t/	/g/	/s/
P1				
N1		95		
P2		155		

Were client's responses to the stimuli presented significantly different from noise? (i.e. p <= 0.05)

	/m/	/t/	/g/	/s/
;5 dB SP		0.001		

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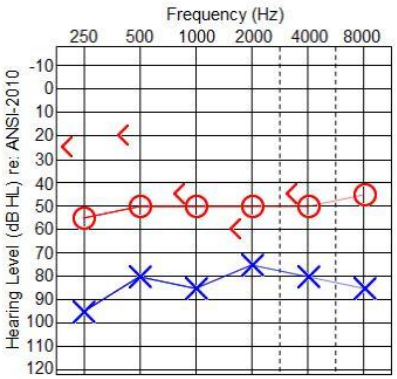
PARENTAL CONCERN REPORTED OCT. 2025

- Parents reported that child was not as responsive to sound.
- An audiologic evaluation was recommended to assess child's auditory function and needs.
- Reprogram hearing aids if change in hearing is identified.



COMPOSITE AUDIOGRAM OVER TWO SESSIONS

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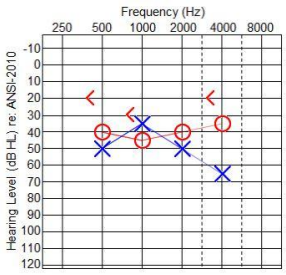
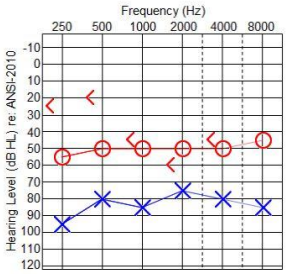
COMPARISON FROM 3/2025 AND 12/2025





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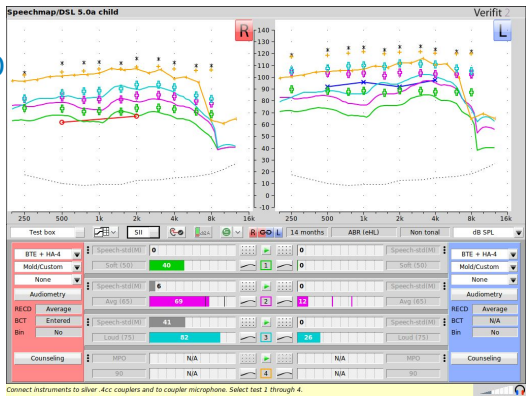
HEARING AIDS NO LONGER HITTING DSL 5.0 TARGETS



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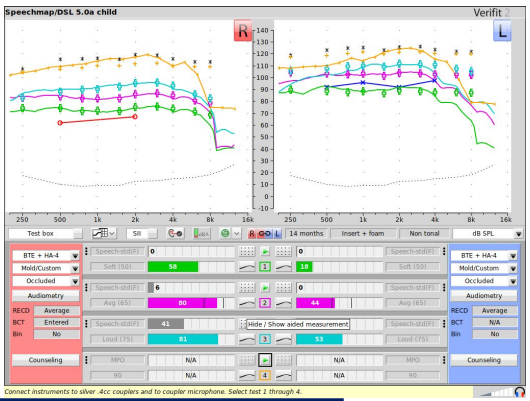
REPROGRAMMED HEARING AIDS

RMSE		
	Right	Left
50 dB SPL	1.2	3.1
65 dB SPL	1.4	3.0
75 dB SPL	1.7	4.4



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PLAN OF ACTION

- Significant change in hearing since diagnosis.
- Cortical Auditory Evoked Potentials to confirm appropriate aided benefit
- Parents received diagnosis - Pendred syndrome

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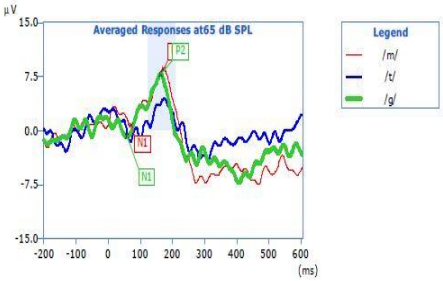
RIGHT AIDED CAEP RESPONSE



Latencies for responses at65 dB SPL (ms)

	/m/	/t/	/g/	/s/
P1				
N1	70		57	
P2	172		160	

Were client's responses to the stimuli presented significantly different from noise? (i.e. p <= 0.05)

	/m/	/t/	/g/	/s/
;5 dB SP	**0.000**	0.068	**0.000**	

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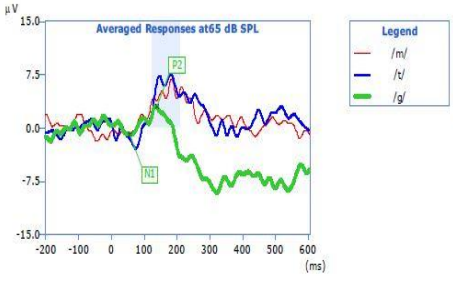
LEFT AIDED CAEP RESPONSE



Latencies for responses at65 dB SPL (ms)

	/m/	/t/	/g/	/s/
P1				
N1			54	
P2			136	

Were client's responses to the stimuli presented significantly different from noise? (i.e. p <= 0.05)

	/m/	/t/	/g/	/s/
;5 dB SP	0.068	0.083	**0.000**	

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OUTCOME

- Cochlear implant for the left ear because aided CAEP suggests limited benefit from conventional amplification.
- Family decided to pursue CI on the left because of the greater likelihood of decrease in hearing in the future.
- Unless there is further change to his hearing he will be bimodal

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QUESTIONS?

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