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Allied Health Media AudiologyOnline

Why Isn't Real Verification Performed?

Presenter: Michael Valente, PhD

Moderator: Carolyn Smaka, AuD, Editor in Chief, AudiologyOnline

Allied Health Media AudiologyOnline

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Why Isn't Real Ear Verification Performed?

Michael Valente
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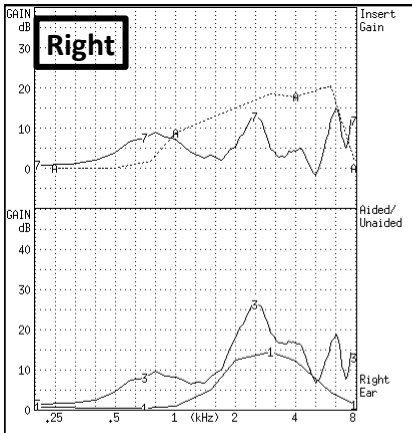
Audiology Online
February 15, 2017

Learning Outcomes

- **After this course, learners will be able to:**
  - **Explain why purchasing and using a hearing aid analyzer (coupler and real-ear) is cost effective**
  - **Describe the benefits of fitting with REM versus manufacturer default first-fit**
  - **Discuss the results of a recent study investigating REM versus manufacturer first-fit**

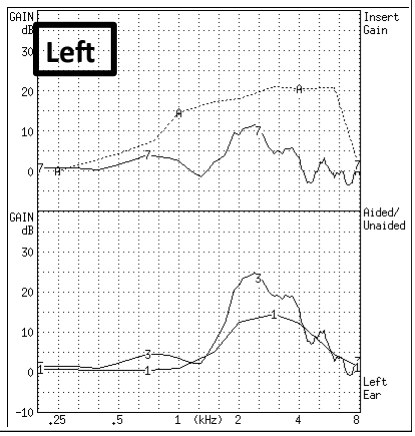
Hearing Aid Dispensed @ "Big Box"

*Patient reported dispenser stated REM was performed

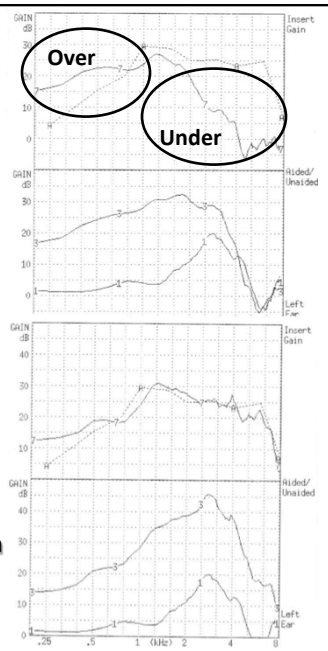


Oy!

The good news… not much chance for feedback!



Now, Example of a Hearing Aid Fit at a Audiology Clinic in St. Louis

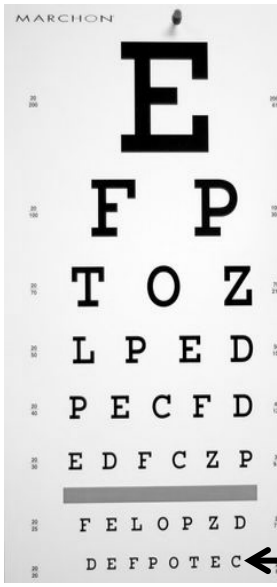


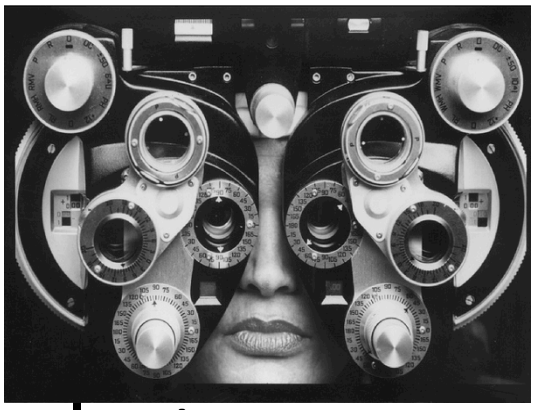
I re-programmed to NAL-NL1 corrected for bilateral and channel (six) summation

Question – does the programmed fit result in a better outcome than the first-fit?

Consider This:

When visiting an Ophthalmologist or Optician patients expect…..





Phoropter

		Sph	Cyl	Axis	Add
D.V	OD	-1.5	-1.0	110	+2.5
	OS	-1.25	-0.5	120	+2.5
N.V	OD	+1.50			
	OS	+1.50			

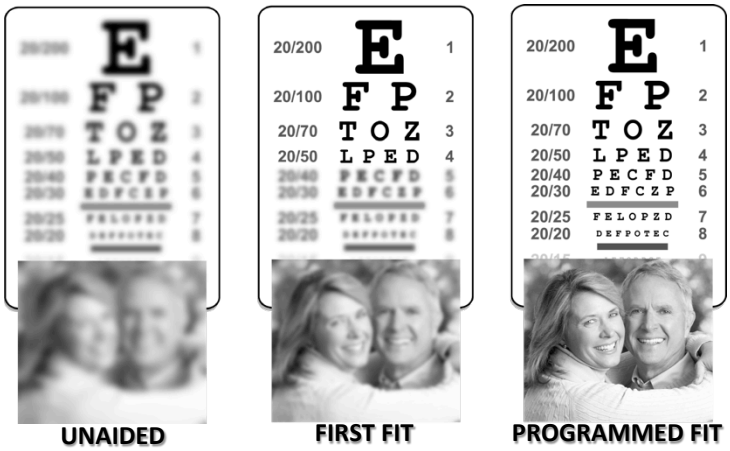
Distance Vision

Near Vision

Target is "20/20"

Prescription to "hit" 20/20

Analogy



UNAIDED

FIRST FIT

"How does that sound?"

OR

"Sounds pretty good, doesn't it?"

PROGRAMMED FIT

Imagine you're at this webinar, but instead you're Opticians or Ophthalmologists.

Could you, in your wildest dreams, think that as a lecturer at <u>that</u> webinar I would suggest that one way to differentiate a "good practice" from a "poor practice" is that "good" practices use a Phoropter?

Has anyone in this audience ever been fit <u>without</u> using a Phoropter or did your Optician or Ophthalmologist simply place eyeglasses over your eyes and say "Things look pretty good, don't they"?

Why are we still lecturing that using coupler and real ear measures somehow separates "good" from "poor" practices?

Shouldn't we have progressed far beyond this?

We've expanded to an AuD and we're still lecturing about this?

Why isn't coupler and real ear measures the expected standard of care?

So, why aren't real ear measures performed on every patient and coupler measures performed on every hearing aid?

What are the reasons offered as explanations as to why coupler and real ear aren't used?

Reasons I've Heard or Read…..

- "Too expensive"
- "No data supporting advantage of verification improving outcome"
- "Takes too much time"
- "Only verify "special cases" "
- "Don't have the equipment"
- "Have the equipment, but don't know how to use"

Now, Let's Debunk Each Reason Honestly and Openly

(I will not be making many friends going forward)

Let's 1st Discuss the Cost of Diagnostic Equipment

- GS Audio Star Pro = $9,619
- Interacoustics AC40 = $9,250
- Add loudspeakers = $700
- Wireless VRA w/center toy = $1,600
- GS TympStar Pro = $9,595
- Interacoustics AT235h = $7,203
- GS Corti Handheld DPOAE = $5,910
- Biologic Scout Sport PC Based DP/TEOAE = $12,170
- Biologic NAV-Pro 2 channel ABR with PC and Printer = $20,325
- Interacoustics Eclipse EP25 2 channel ABR with PC and printer = $21,740

I Don't Think Anyone Would Question the Need, at a Minimum, for an Audiometer and Immittance Unit

In our clinics (10 double-walled booths @ 4 sites) we have GSI-16 or Madsen Astera @ each booth (i.e., ten 2-channel audiometers) and five GSI immittance units.

Now, Let's Discuss the Cost of Hearing Aid Analyzer with Real Ear

- AudioScan Verifit 2 = $12,750 (2)
- AudioScan RM500SL = $9,750
- AudioScan Axiom = $7,200 (Monitor + Printer = $400)
- Frye 8000 = $15,974 (6)
- Frye FP 35 = $5,100
- Frye FP35P = $5,500
- Auracle = $14,490 (1)

Think About This….

- Washington University charges $170 for a comprehensive audiogram (92557). It takes ~45 minutes to complete (preparation, direct patient contact + report).
- Our cost/hour, in 2015-2016, without a profit, was $195.47/ hour (this is a lecture in itself).
- $195.47/4 = $48.86/15 minute time slot @ 0% profit
- $48.86 x 3 (45 min) = costs ~$146.58 to provide this service @ 0% profit!
- Payment in 2015-2016 via Medicare and our top five 3rd party payers:
  - Medicare = $36.28 = 80% = $29.02 (17% collection rate)
  - Anthem = $103.80 (61% collection rate)
  - UHC = $81.25 ($48% collection rate)
  - Cigna = $107.86 (63% collection rate)
  - Coventry = $97.34 (57% collection rate)
  - HealthLink = $94.29 (55% collection rate)

All payers are below the cost required to provide the service. Some more than others

Net income (subtract an additional 20%) for the most common CPT codes

Code + Descriptor	Charge	Medicare	Anthem	Cigna	UHC
92550: Tymp + ART	$110	$20.51 (19%)	$58.48 (53%)	$41.44 (38%)	$38.08 (35%)
92557: Comp Audio	$170	$36.28 (21%)	$106.99 (63%)	$110.81 (65%)	$83.69 ($49%)
92567: Tymp	$80	$14.14 (18%)	$38.78 (48%)	$49.30 (62%)	$32.76 (41%)
92570: Immittance	$150	$31.57 (21%)	$87.10 (58%)	$63.37 (42%)	$58.26 (38%)
92584: EcoGH	$415	$70.27 (17%)	$173.77 (42%	$167.18 (40%)	$114.60 (27%)
92585: ABR	$490	$129.76 (26%)	$124.11 (25%	$162.45 (33%)	$179.95 (37%)
92587: OAE- limited	$200	$21.13 (11%)	$103.49 (52%)	-	-
92596: Ear Protect Eval	$59	$47.59 (81%)	-	-	$59.00 (100%)
92626: Eval of Rehab status -1st hour	$312	$144.78 (46%)	-	-	-
3110122: HF audio	$80	$0	$0	$0	$0

Medicare Payment for CI for 2016

CPT Code	Charge	Net Income*
• 92603 Initial Stimulation	$300	$150.22
• 92604 Programming	$265	$88.65
• 92626 Eval of AR status	$290	$88.89

*80% (20% might be collected via supplemental insurance):

- 92603 = $120.18 = 40% collection rate
- 92604 = $70.92 = 28% collection rate
- 92626 = $71.11 = 25% collection rate

Cost for two-channel audiometer + immittance exceed the cost of a hearing aid analyzer.

Most audiologists, however, don't think twice about it. It will, however, take years to re-coup the cost due to poor reimbursement and payer-mix.

On the other hand, it may take only a few months to re-coup the cost of a hearing aid analyzer because net income is 100% (at least in our Division)

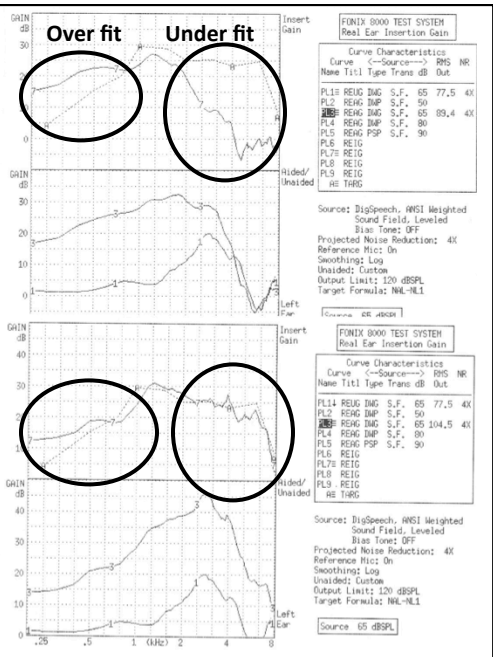
Response to……

"No evidence to show verification improves performance"

A. Manufacturer First-Fit

B. Programmed to NAL-NL1

Would "B" provide a better outcome than "A"?



We Know…….

a. Most audiologists don't verify HA fittings and rely on First-Fit (~70 - 80%).
b. ASHA and AAA Best Practice Guidelines advocate coupler and real ear.
c. The role of HF's in speech recognition.
d. Adult patients have poorer HF hearing.
e. "First-Fit" under-amplifies HF gain or output.
f. Patient satisfaction continues to be poor in spite of significant advances in HA technology.
g. Market penetration has increased only slightly in the past several decades.
h. Concerns of impact of PSAPs, OTC, internet, big box, FDA, etc., on profitability and viability of Audiology…….

Kirkwood (2010)

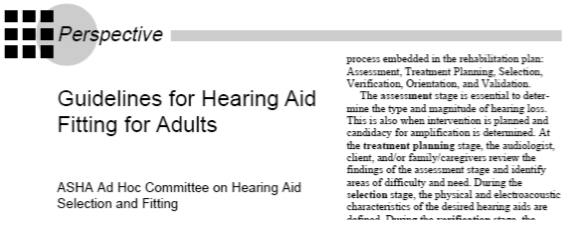
"How often do you do REM?

	0%	Occasionally	<50%	50%	Most of Time	Almost Always
Audiologist	29.9	19.5	13.2	7.1	11.5	19.2
HIS	27.0	21.1	8.9	8.9	13.0	21.1

Audiologists demand autonomy, but how can we rightfully demand autonomy if we can't distinguish ourselves from those we want to be autonomous from?

ASHA Guideline (1998)

- **ASHA – <u>Guidelines for Hearing Aid Fitting for Adults</u> "In order to determine how the hearing aids are performing for a given client, probe microphone measures should be made unless contraindicated by physical limitations (e.g., size of ear canal, drainage, excessive cerumen, etc.) *This guideline strongly support the use of real-ear measures, when applicable, as the primary method of verifying the performance of hearing aids."***



Perspective

Guidelines for Hearing Aid Fitting for Adults

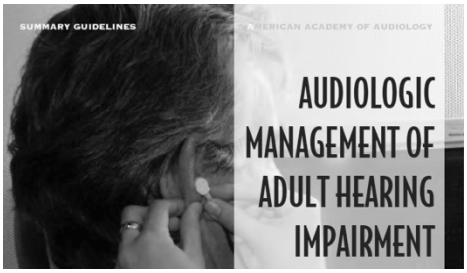
ASHA Ad Hoc Committee on Hearing Aid Selection and Fitting

process embedded in the rehabilitation plan: Assessment, Treatment Planning, Selection, Verification, Orientation, and Validation.

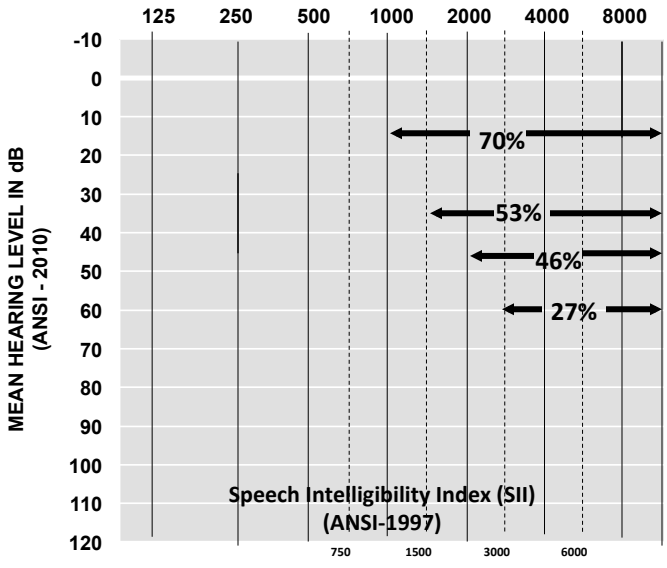
The assessment stage is essential to determine the type and magnitude of hearing loss. This is also when intervention is planned and candidacy for amplification is determined. At the treatment planning stage, the audiologist, client, and/or family/caregivers review the findings of the assessment stage and identify areas of difficulty and need. During the selection stage, the physical and electroacoustic characteristics of the desired hearing aids are

AAA Guideline (2006)

- **AAA – Guidelines for the Audiologic Management of Adult Hearing Impairment**
  - ***"Test-retest reliability exceeding that demonstrated by other verification techniques has been demonstrated for probe microphone measurements. Deviations from target gain in a non-linear hearing aid may lead to reduced hearing aid benefit."***



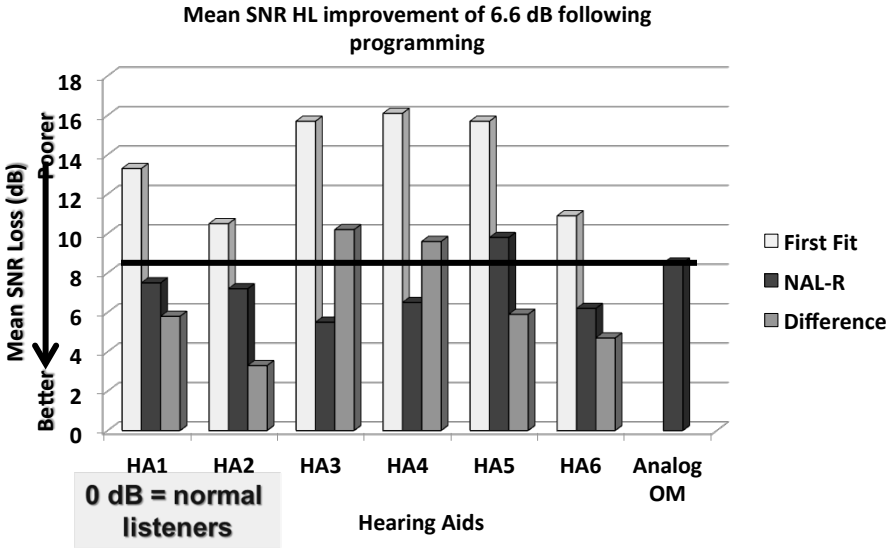
SII



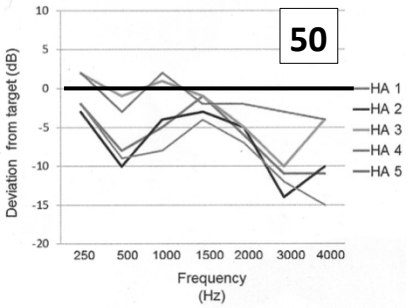
First-Fit Under-Amplifies HF

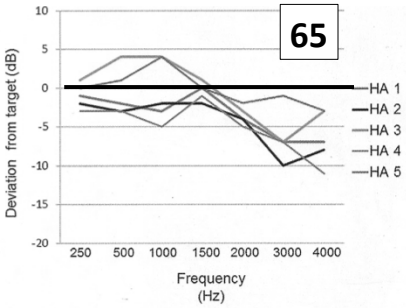
- Swan and Gatehouse (1995)
- Hawkins and Cook (2003)
- Aarts and Caffee (2005)
- Aazh and Moore (2007)
- Aazh et al (2012)
- Abrams et al (2012)
- Boymans and Dreschler (2012)
- Leavitt and Flexor (2012)
- Munro et al (2015)
- Sanders et al (2015)

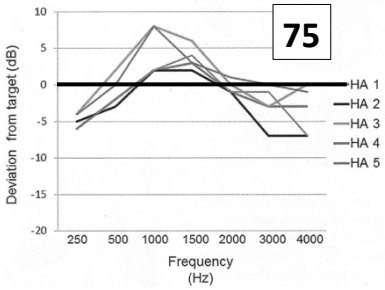
Leavitt and Flexer (2012)



Sanders, Stoody, Weber and Mueller (2015)

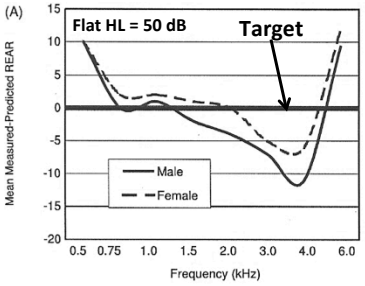


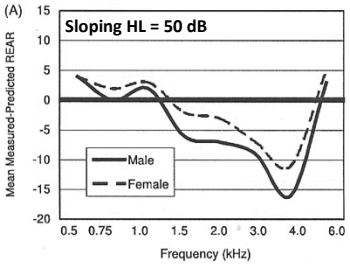


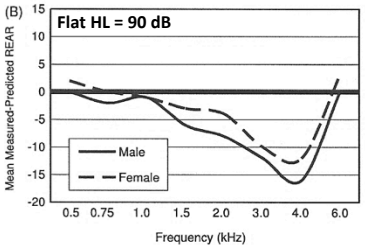


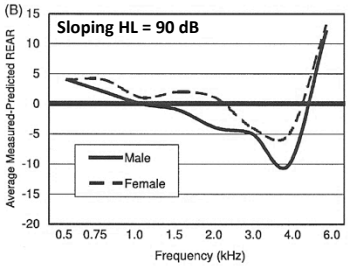
Difference between NAL-NL2 (0 dB line) and First-Fit REAR for 5 premium hearing aids @ 55, 65, and 75 dB SPL

Aarts and Caffee (2005)









British Society Of Audiology (2007) **requires REIG to be within +/- 5 dB @ 250-4000 Hz and +/- 8 dB at 6000-8000 Hz to be compensated.**

Mueller and Picou (2010): **only 30% of audiologists routinely ("nearly always"; "always") perform REM (probably lower).**

Consumer Reports (2009): **66% of HA's not fitted correctly and audiologists and HIS do not routinely conduct REM.**

Palmer (2009): **failure to use REM is unethical based on AAA Code of Ethics to "maintain high standards of professional competence."**

Kochkin (2010): **HA satisfaction is linked to the number of protocol steps taken @ the fitting. Greater # of steps (up to 5) leads to > satisfaction. REM is #4 of the 5 steps yielding > patient satisfaction.**

The Impact of the Audiologist on Hearing Aid User Success

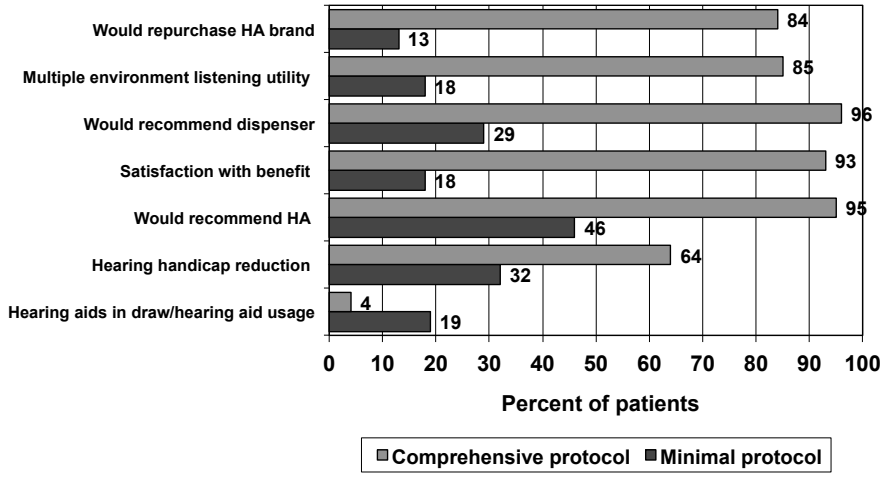
April 2010

Hearing Review

MarkeTrak VIII
Kochkin et al (2010)

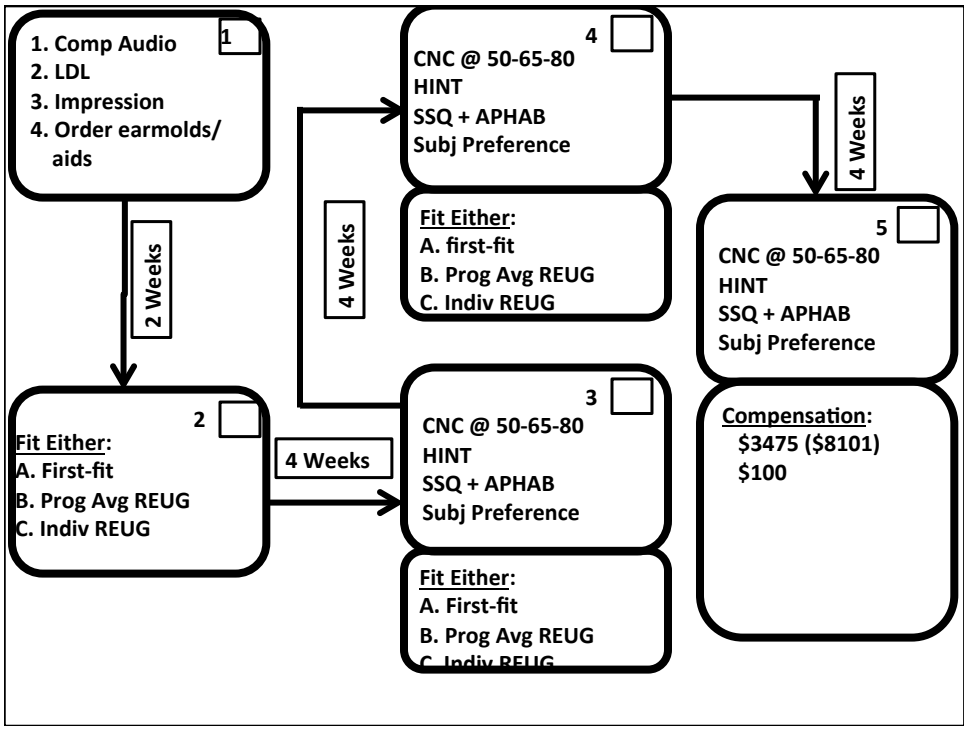
- N = 884 New users and 1141 experienced
- 17 Fitting protocol steps
- Order of relationship to successful fitting:
  - Fit and comfort (1-7 on Likert Scale) and achieved sound quality (7 items on the 7 point Likert Scale)
  - Fewer number of visits
  - Attribute of the fitter and the fitter's office
  - *REM verification*
  - Subjective benefit measures
  - Measure loudness discomfort
  - Objective benefit measure : speech measures
  - Customer satisfaction measures
  - Received self-help book
  - Counseling during first two months:
  - Hearing tested in sound booth
  - Received self help video
  - Auditory retraining software therapy
  - Referral to HLAA
  - AR Group

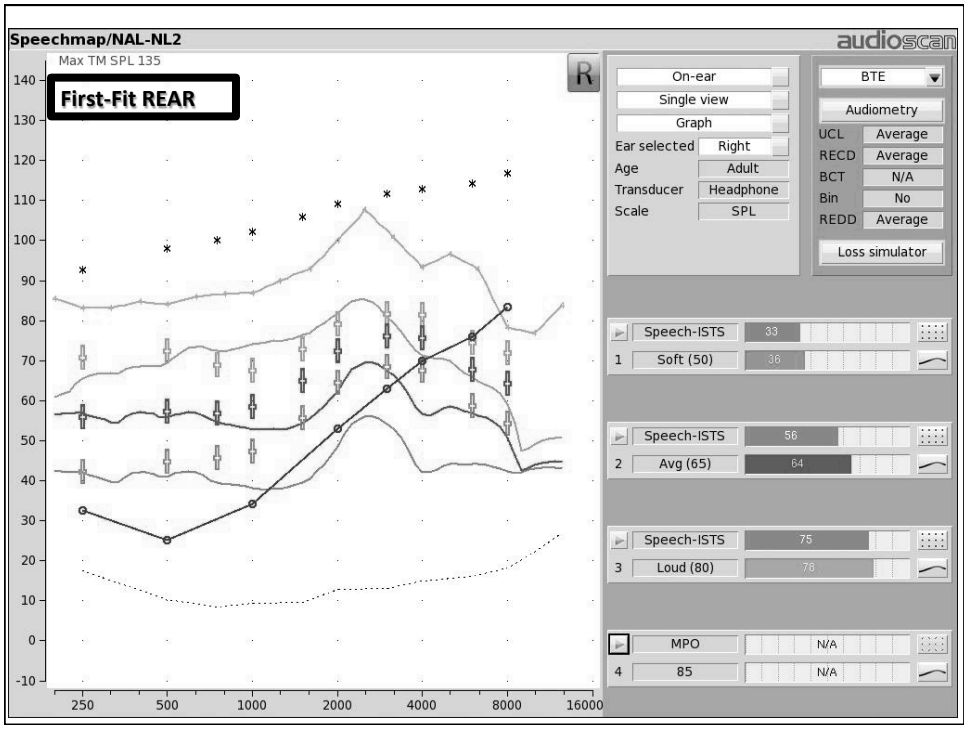
Impact of a protocol on hearing aid success comparing a minimum protocol (0-2 items) to a more comprehensive protocol (10-12 items).

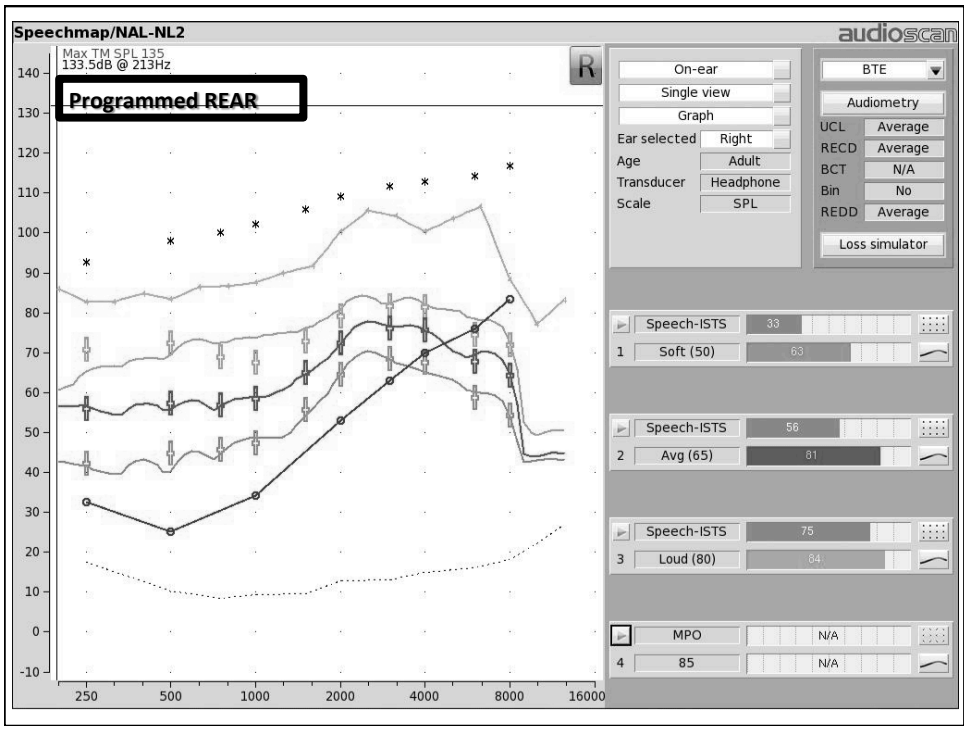


Valente et al (2017)

Recently submitted to JAAA




Speechmap/NAL-NL2
audioscan
Max TM SPL 135
First-Fit REAR
R
On-ear
Single view
Graph
Ear selected Right
Age Adult
Transducer Headphone
Scale SPL
BTE
Audiometry
UCL Average
RECD Average
BCT N/A
Bin No
REDD Average
Loss simulator
Speech-ISTS 33
1 Soft (50) 36
Speech-ISTS 56
2 Avg (65) 64
Speech-ISTS 75
3 Loud (80) 78
MPO N/A
4 85 N/A
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
250 500 1000 2000 4000 8000 16000


Speechmap/NAL-NL2
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R
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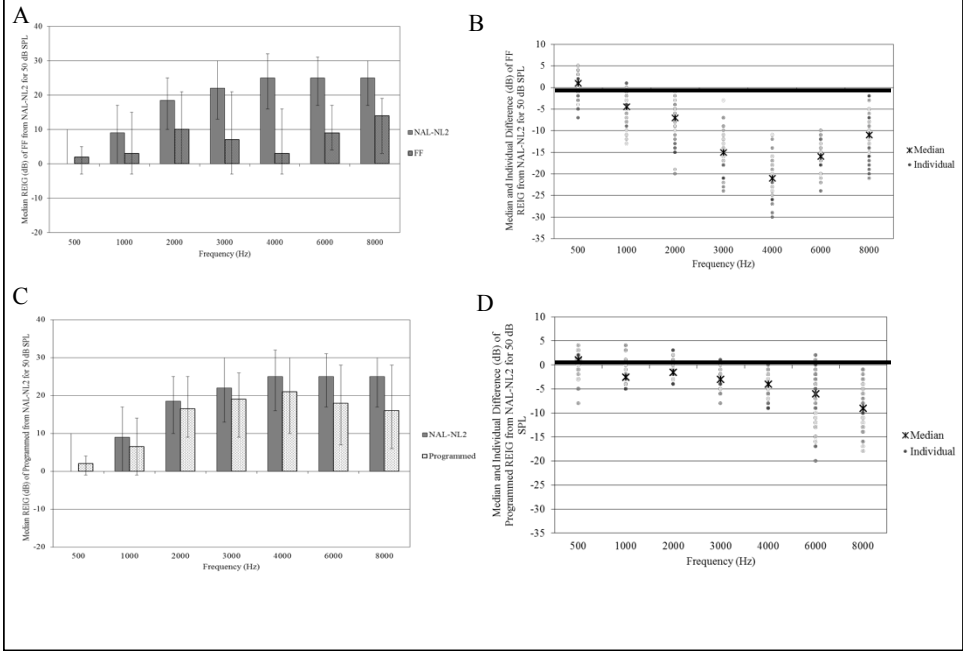
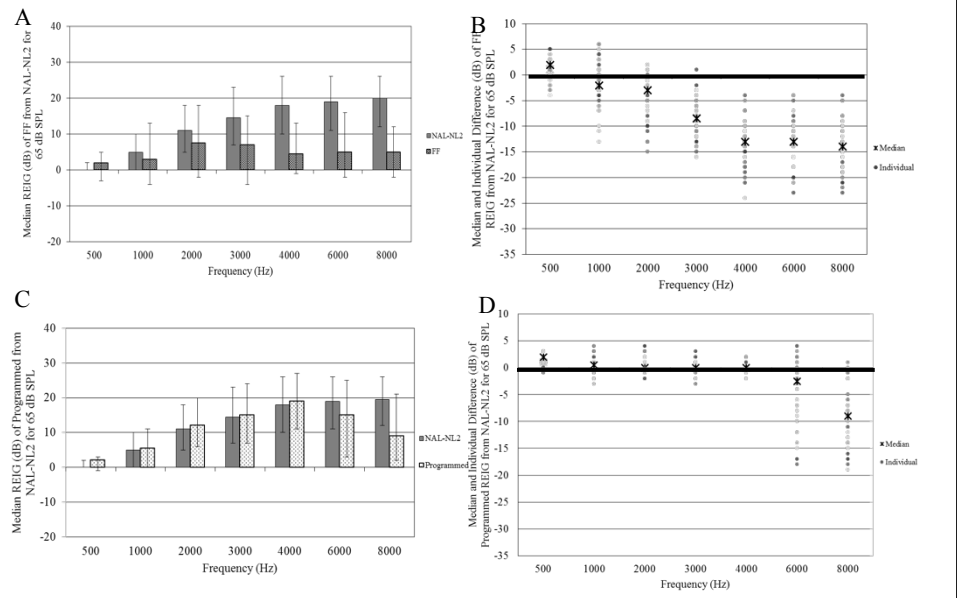
Graph
Ear selected Right
Age Adult
Transducer Headphone
Scale SPL
BTE
Audiometry
UCL Average
RECD Average
BCT N/A
Bin No
REDD Average
Loss simulator
Speech-ISTS 33
1 Soft (50) 63
Speech-ISTS 56
2 Avg (65) 81
Speech-ISTS 75
3 Loud (80) 84
MPO N/A
4 85 N/A
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
250 500 1000 2000 4000 8000 16000

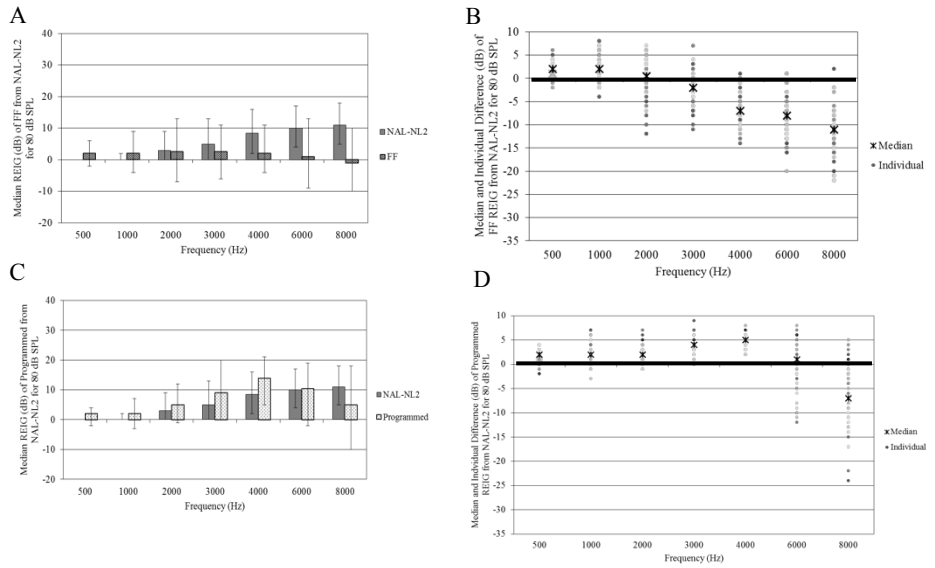
REIG at 50 dB SPL



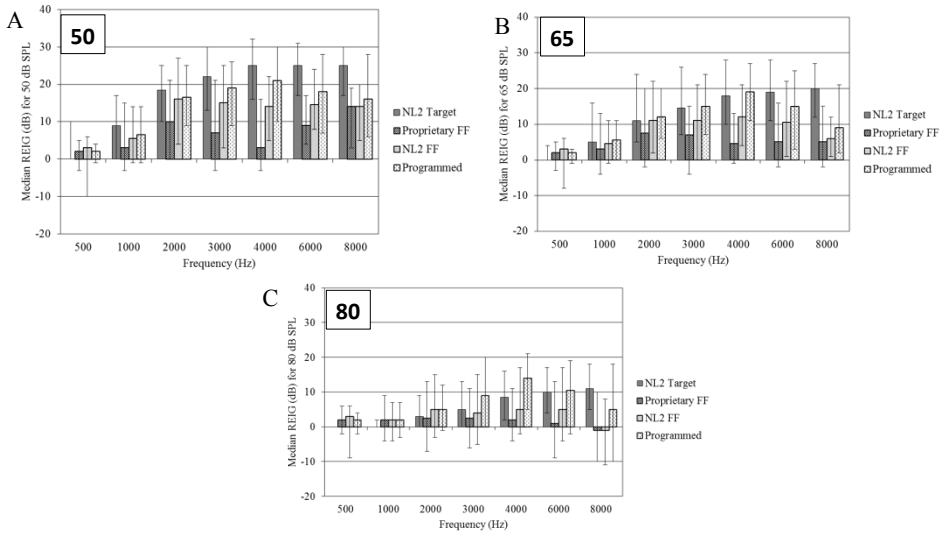
REIG at 65 dB SPL



REIG at 80 dB SPL

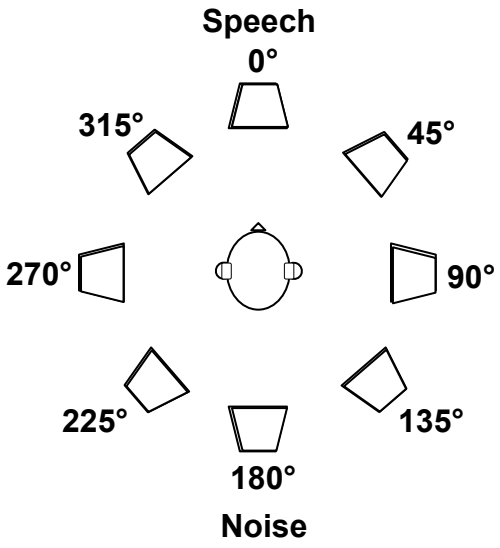


REIG at 50, 65, and 80 dB SPL for NAL-NL2, Proprietary FF, NAL-NL2 FF, and Programmed

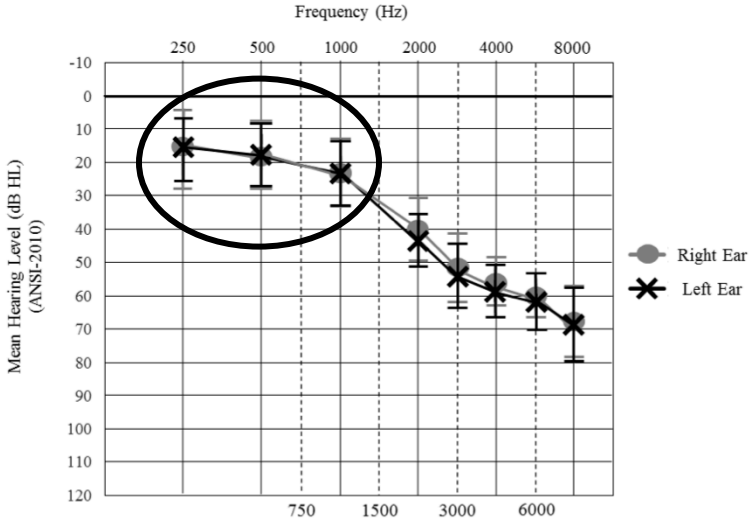


Listening Conditions

- CNC Words
  - Quiet
  - Speech @ 0°
    - 50, 65, and 80 dB SPL
- HINT Sentences
  - Noise
  - Speech @ 0°
  - Noise from 8 loudspeakers (45° steps)
- CNC and HINT lists and treatment levels randomized



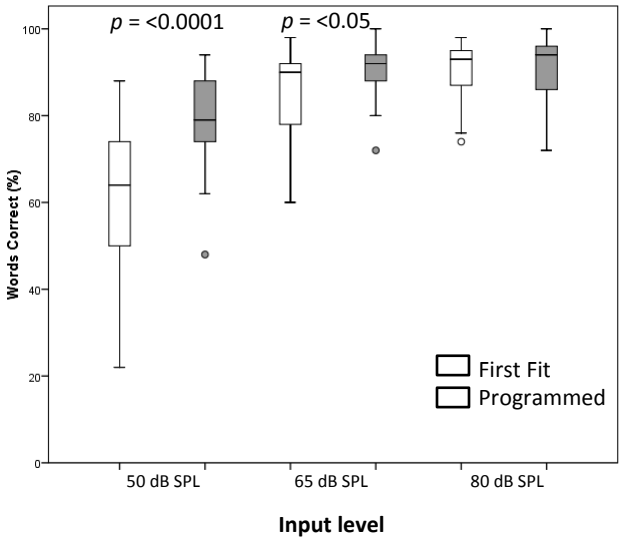
Mean Audiogram

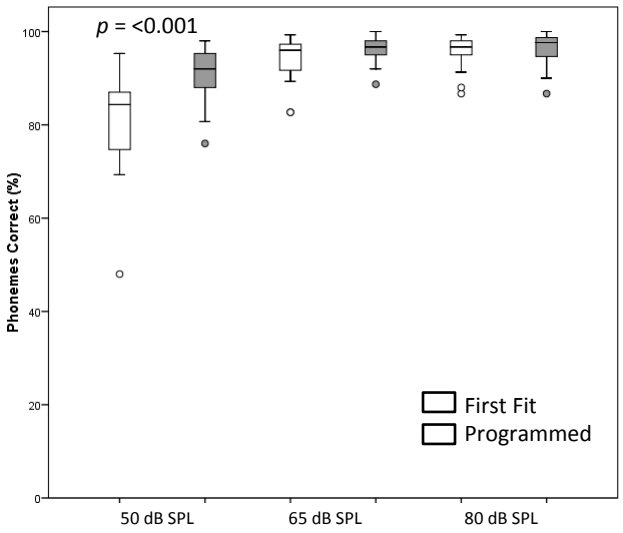


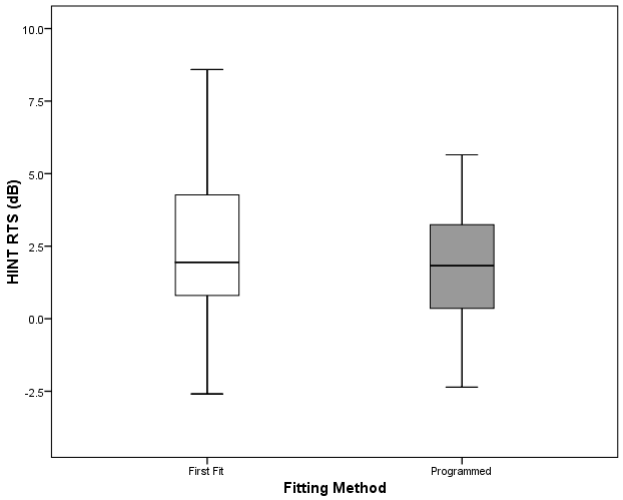
In this <u>double-blind</u> study, 19/24 participants preferred the programmed fit!

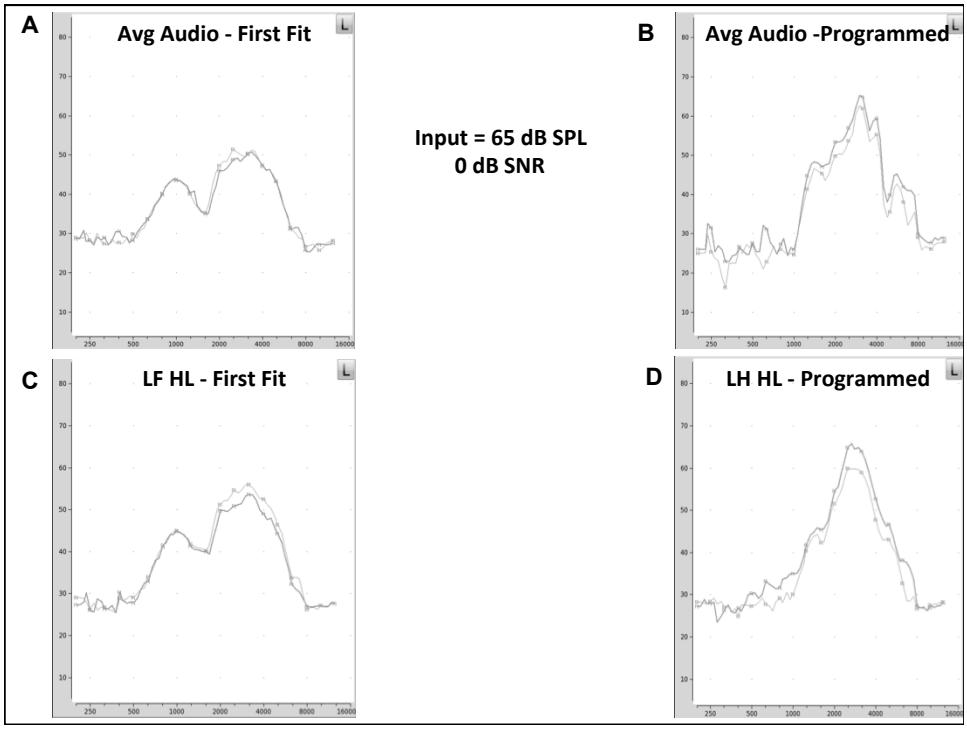
Ponder the importance of this on:
a. The profitability and viability of your practice
b. Ability to combat recent perceived threats
b. Practice growth
c. Patient satisfaction

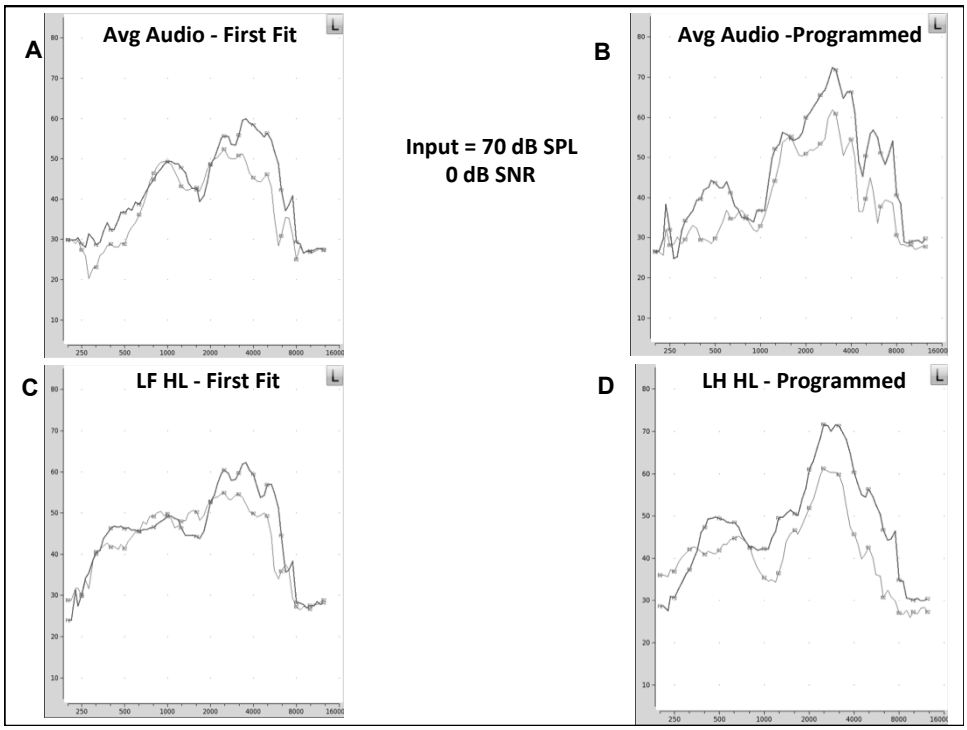
Patient satisfaction is the best marketing tool. What do you pay annually for marketing (we spent $0)? Could that money be better spent on REM to create more satisfied patients to do your marketing?

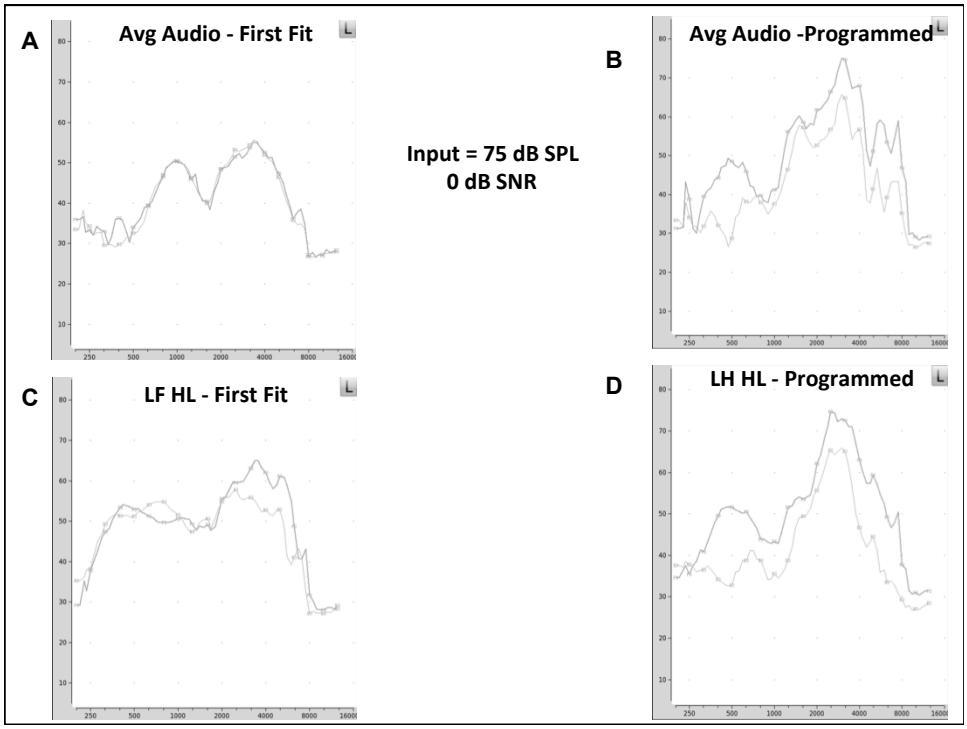


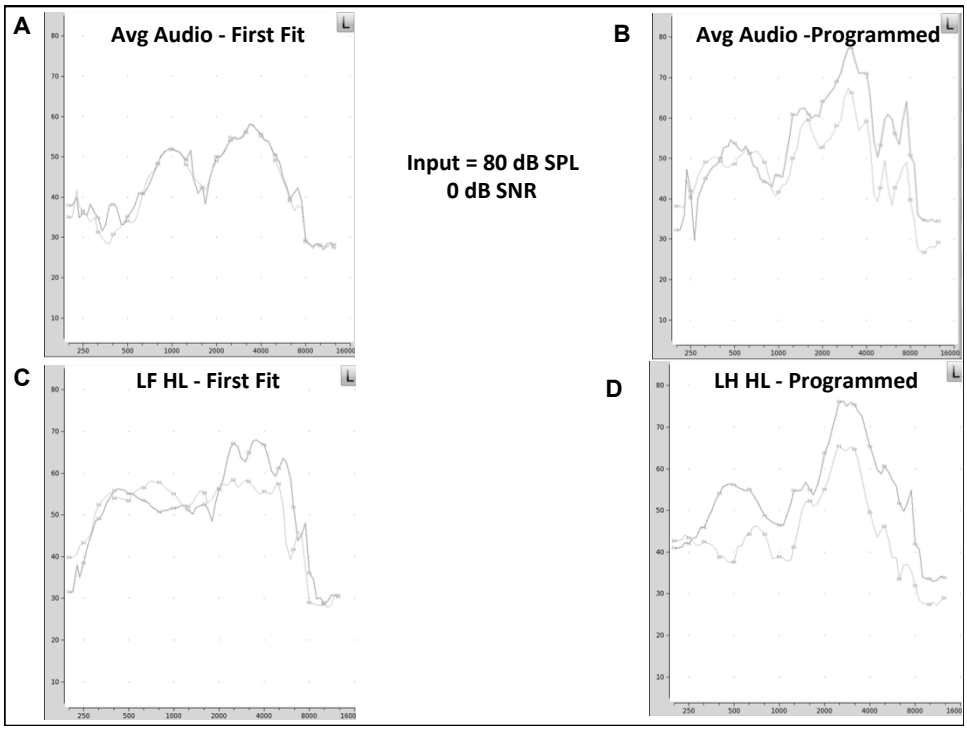

p = <0.001
Phonemes Correct (%)
100
80
60
40
20
0
First Fit
Programmed
50 dB SPL
65 dB SPL
80 dB SPL
Input level

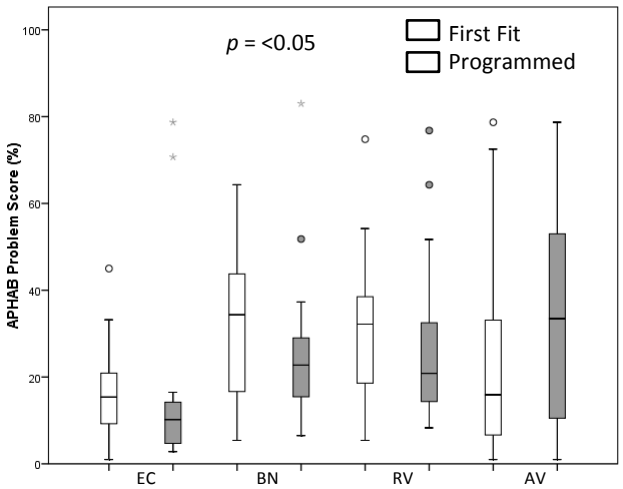

HINT RTS (dB)
10.0
7.5
5.0
2.5
0.0
-2.5
First Fit
Programmed
Fitting Method

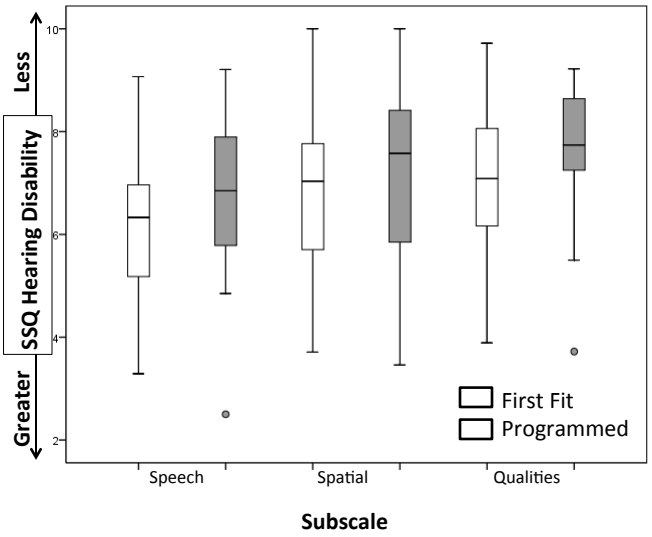

A
Avg Audio - First Fit
B
Avg Audio -Programmed
Input = 65 dB SPL
0 dB SNR
C
LF HL - First Fit
D
LH HL - Programmed


A
Avg Audio - First Fit
B
Avg Audio -Programmed
Input = 70 dB SPL
0 dB SNR
C
LF HL - First Fit
D
LH HL - Programmed


A
Avg Audio - First Fit
B
Avg Audio -Programmed
Input = 75 dB SPL
0 dB SNR
C
LF HL - First Fit
D
LH HL - Programmed

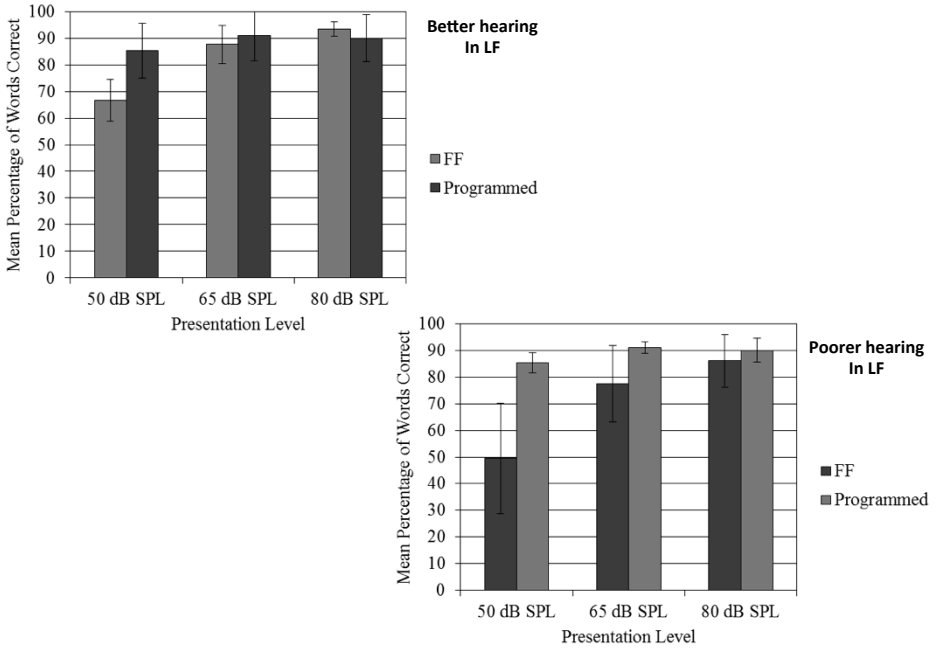

A
Avg Audio - First Fit
B
Avg Audio -Programmed
Input = 80 dB SPL
0 dB SNR
C
LF HL - First Fit
D
LH HL - Programmed


p = <0.05
First Fit
Programmed
APHAB Problem Score (%)
100
80
60
40
20
0
EC
BN
RV
AV
Subscale

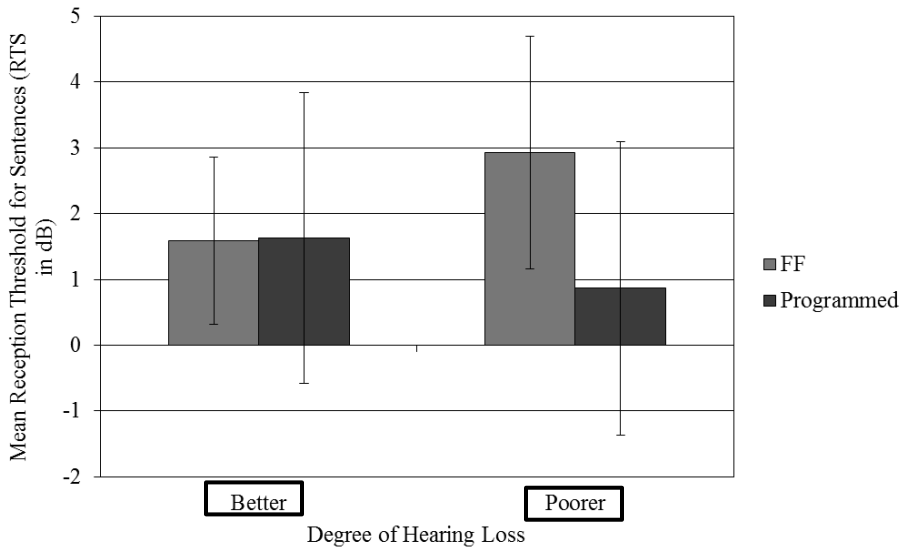

Less
SSQ Hearing Disability
Greater
10
8
6
4
2
First Fit
Programmed
Speech
Spatial
Qualities
Subscale

Impact of Magnitude of Hearing Loss in the Low Frequencies

CNC Words



HINT

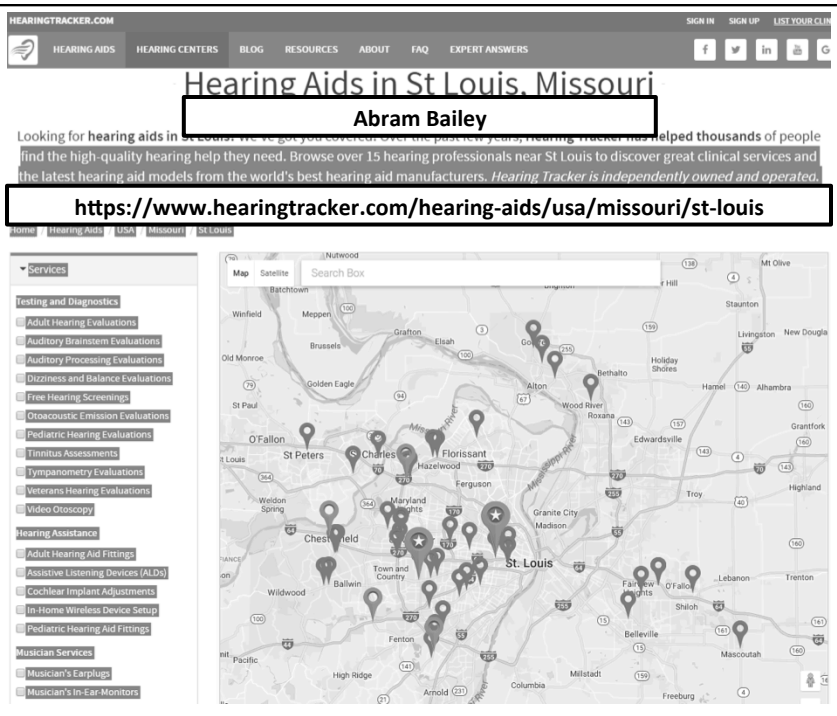


Responses to additional reasons verification is not performed

- **Laziness:**
  - **Can get away with it because not required for license or payment**
  - **Could be violation of Code of Ethics (Catherine Palmer)**
- **Only need to verify "special cases." I don't even know what this means.**
- **Don't have the equipment – get it**
- **Have the equipment, but don't know how to use it. Read the manual or view excellent video clips on various websites and U-Tube.**
- **Poor training at AuD program and/or internship or externship.**
- **"New guard" hampered by the "old guard"**
- **Poor ability to "negotiate" with business manager or director.**

Reasons to complete verification

- ASHA (1995) and AAA (2006): Best Practice Guidelines support coupler and REM:
  - ANSI-2009: new and repaired
  - ANSI-1992 or Multicurve to "measure" IMD
  - Verify directional microphone – you might be amazed that "automatic" default programs do not convert to DM as external noise increases and how this impacts patient counseling.
  - Measure T-coil to 0 dB RSETS
- New research supports programmed is better than first-fit
- Literature reports first-fit significantly under-amplifies higher frequencies where HL is greater for most patients.
- MarkeTrak: REM improves patient satisfaction
- Distinguish yourself from competition
- It is the "right thing to do." It's best practice
- Hearing Tracker: pointing patients to clinics using best practice
- Need to always incorporate best practice, but especially if training interns and externs
- Help improve patient satisfaction with hearing aids to expand your practice and increase profitability.
- Combat "if they don't do REM" go someplace else.



AS MICHAEL JORDAN SAID…