Build Practice Success with Hearing Aid Verification

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Speaker Disclosure

- Relevant Financial Relationships:
  - Employee of Audioscan
- Relevant Nonfinancial Relationships:
  - None

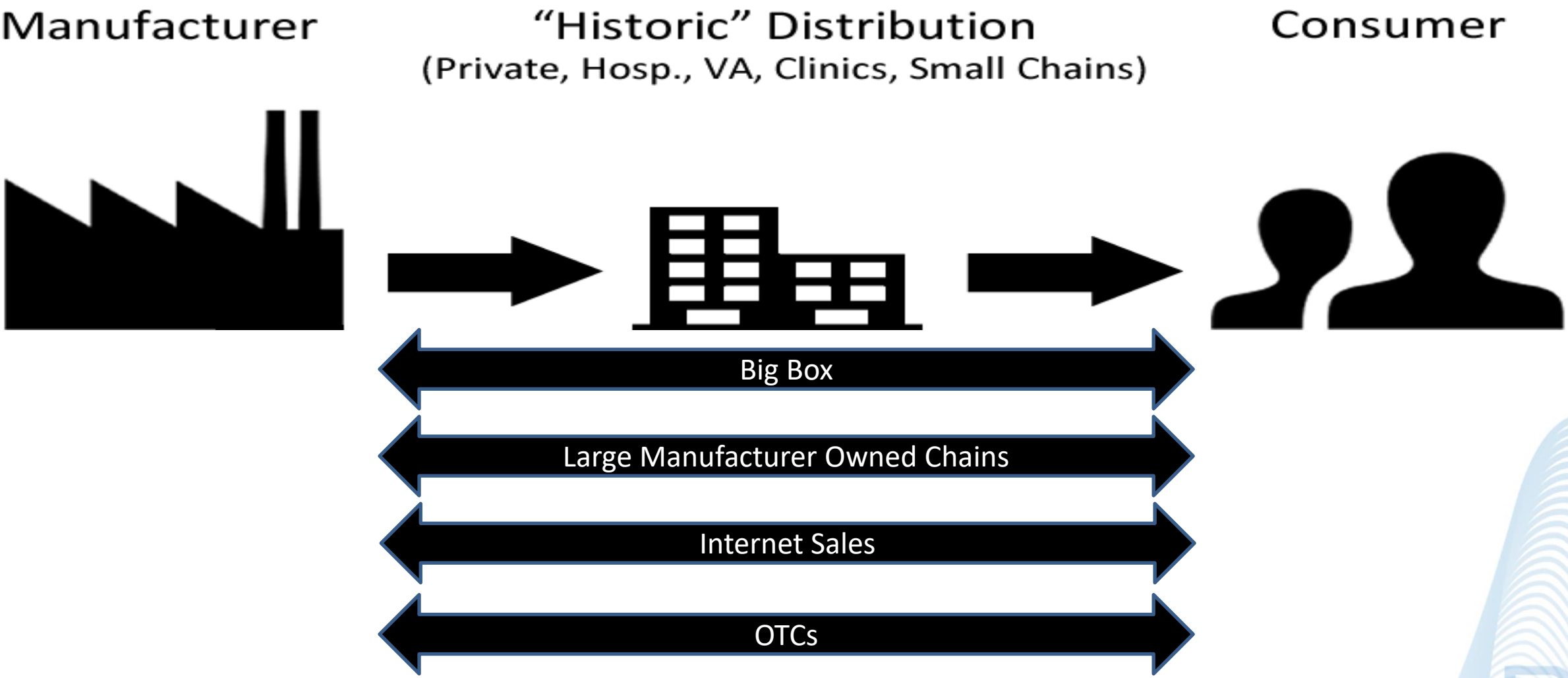
Learning Objectives

- Why verification services are needed
- How verification services can build practice success
- New tools supporting accurate & efficient verification
- Verification workflow considerations

Build Practice Success

Why verification services are needed

Evolving Product and Service Delivery



Evolving Product and Service Delivery

- Expected to…
  - Provide improved access to “hearing aids”
  - Offer lower cost alternatives than historically available
  - Drive consumer focus towards product as the sole solution

How to address ‘product focus’ , differentiate and build practice success?

Verification Services

“Real-ear measurement”

REM associated with…

- Improved audibility
- Improved listening outcomes
- Improved patient satisfaction
- Improved patient loyalty
- Improved perceived quality of services
- Improved fitting efficiency (reduce fitting visits)

*See Valente et al. (2018); Amlani et al. (2016, 2017); Abrams et al. (2012); Aazh & Moore (2007), etc.

"Prescribed gain (output) from a validated prescriptive method should be verified using a probe-microphone approach that is referenced to ear canal SPL."

American Academy of Audiology Best Practice Guidelines (2006)

Ethical Considerations

"Members shall use all resources to provide the best possible service."

"Members shall evaluate services and products rendered to determine effectiveness".

Principle 1: ADA Code of Ethics

"Members shall provide only those procedures, products and services that are in the best interests of the patient."

Principle 3: ADA Code of Ethics

Are we conducting REM?

~30 - 50%

* Mueller (1999); Mueller (2003); Mueller (2005); Mueller & Picou (2010); Mueller (2014); Valente (2022)

Some Reasons for NOT using REMs…

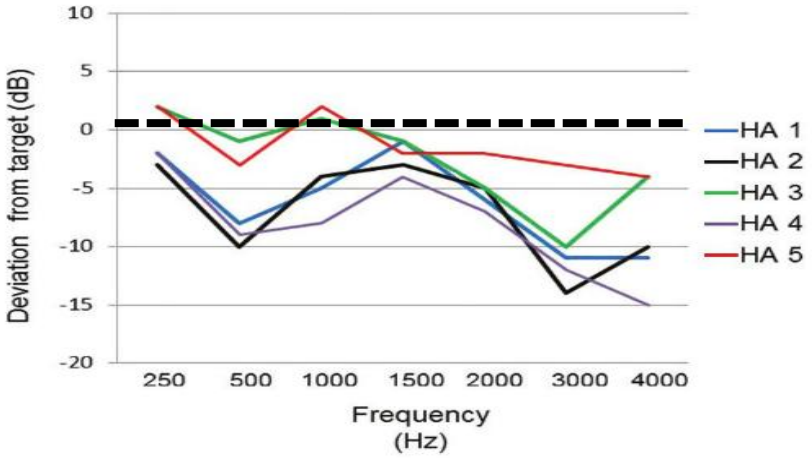
- “The fitting software will set it right, shows me what I need.”
- “Patients don’t like it at target.”
- “Too time consuming”
- “Too difficult”
- “Doesn’t make a difference” [to my patients or my practice]

Many studies have shown quick-fit underamplifies, including…

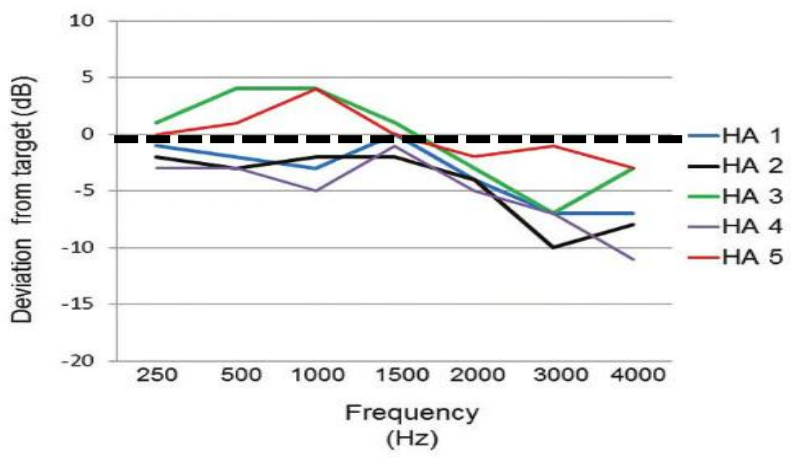
- Swan and Gatehouse (1995)
- Hawkins and Cook (2003)
- Aarts and Caffee (2005)
- Aazh and Moore (2007)
- Aazh et al (2012)
- Abrams et al (2012)
- Boymans and Dreschler (2012)
- Leavitt and Flexer (2012)
- Munro et al (2015)
- Sanders et al (2015)
- Amlani et al (2017)
- Valente et al (2018)
- Folkeard et al (2018)
- Pumford and Mueller (2020)
- ….

NAL-NL2 REAR Results Using 5 Different Manufacturers' Programming Software

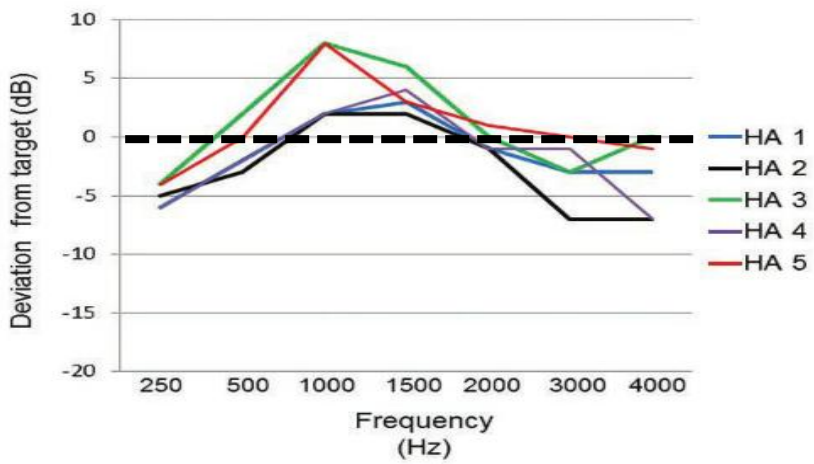
55dB



65dB



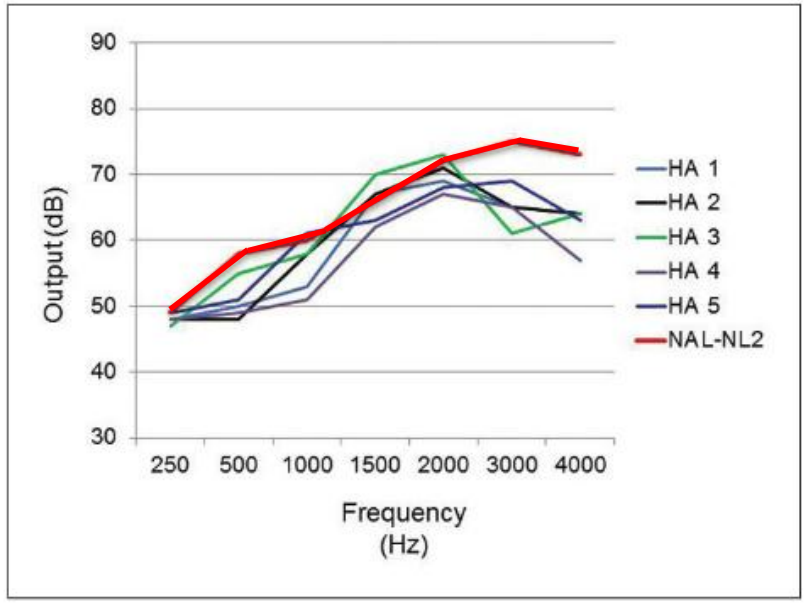
75dB



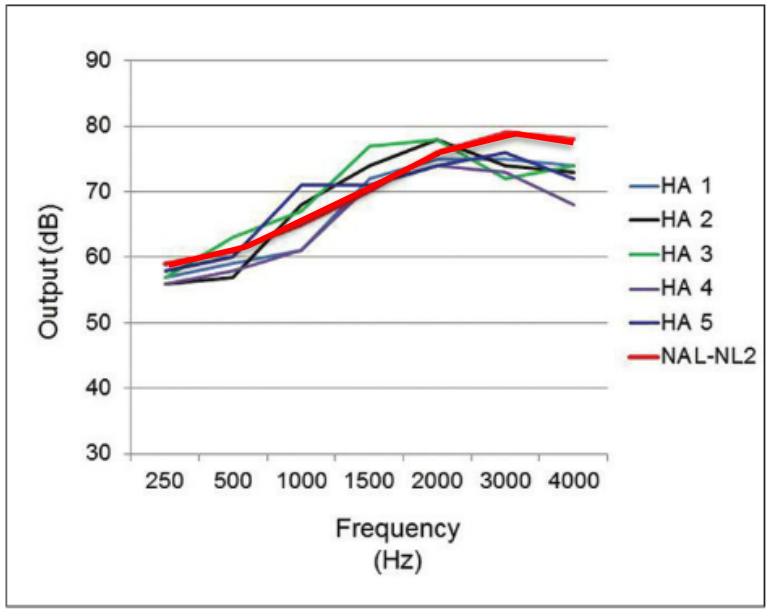
Fitting software showed match within 1 dB!

Sanders, J., Stoody, T., Weber, J., Mueller, H., "Manufacturers' NAL-NL2 Fittings Fail Real Ear Verification" Hearing Review, March 2015; 21(3): 24-32

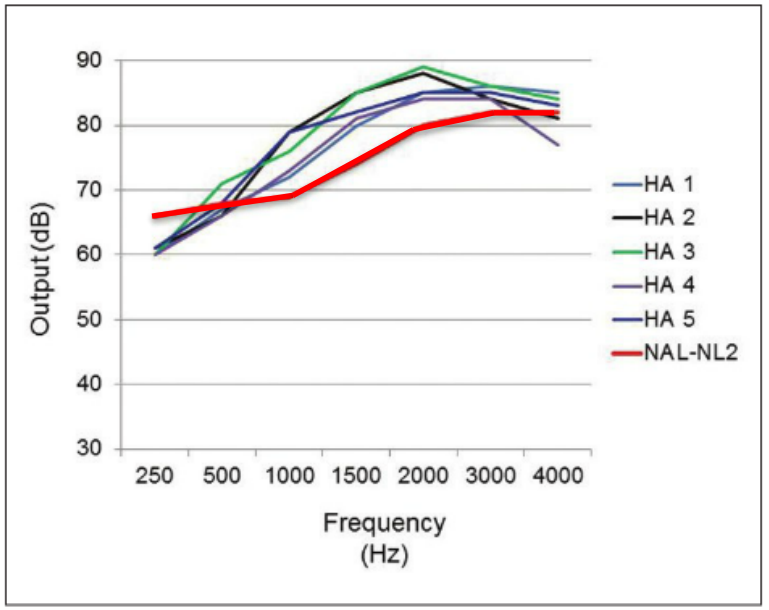
NAL-NL2 Comparison to 5 Different Manufacturers' Proprietary Fittings



55dB



65dB



75dB

N = 16

Sanders, J., Stoody, T., Weber, J., Mueller, H., "Manufacturers' NAL-NL2 Fittings Fail Real Ear Verification" Hearing Review, March 2015; 21(3): 24-32

Importance of ‘Verified’ Audibility

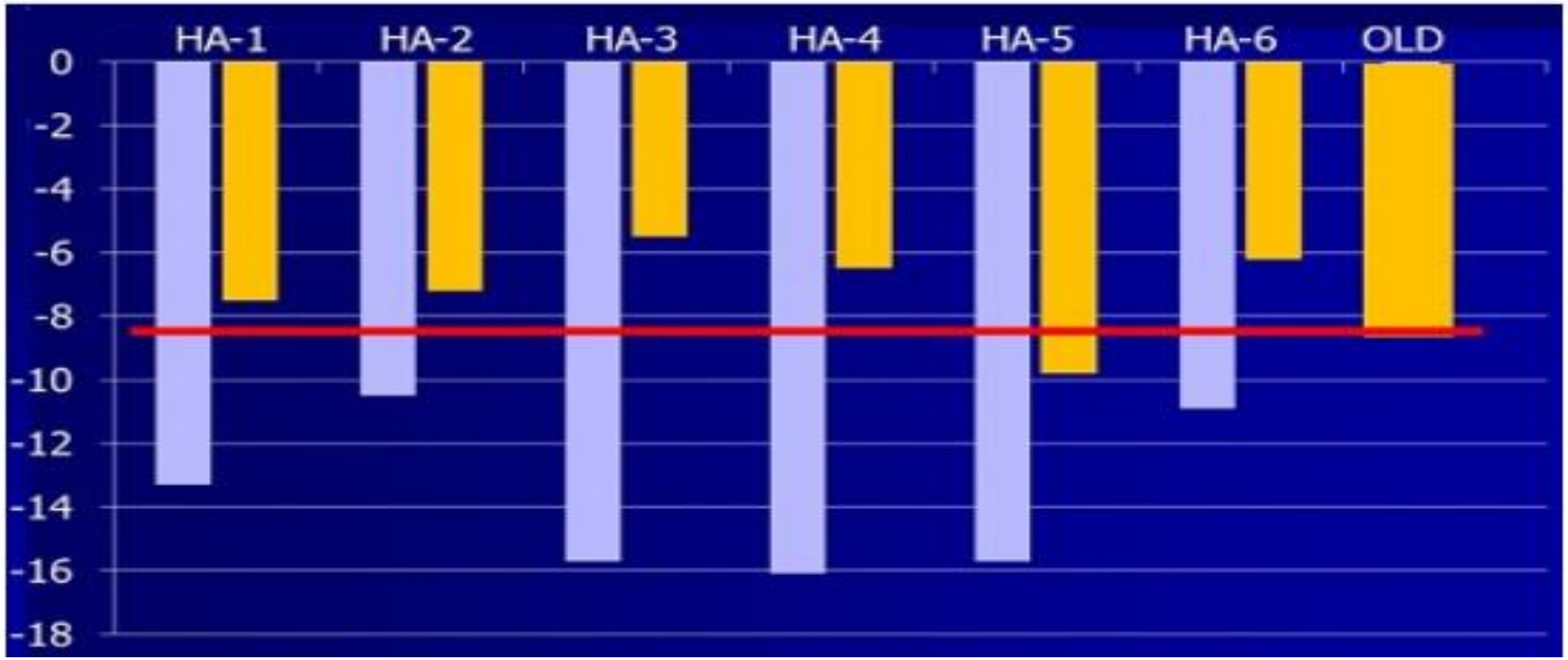


Figure 7. Performance for the aided QuickSIN presented in soundfield at 57 dB SPL. Bars indicate SNR loss. The average SNR disadvantage as compared to individuals with normal hearing. (Adapted from Leavitt & Flexer, 2012).

N = 5

Leavitt R., & Flexer, C. (2012). The importance of audibility in successful amplification of hearing loss. H Review, 19(13), 20-23.
From Mueller, H.G. (2014, January). 20Q: Real-ear probe-microphone measures - 30 years of progress? AudiologyOnline,

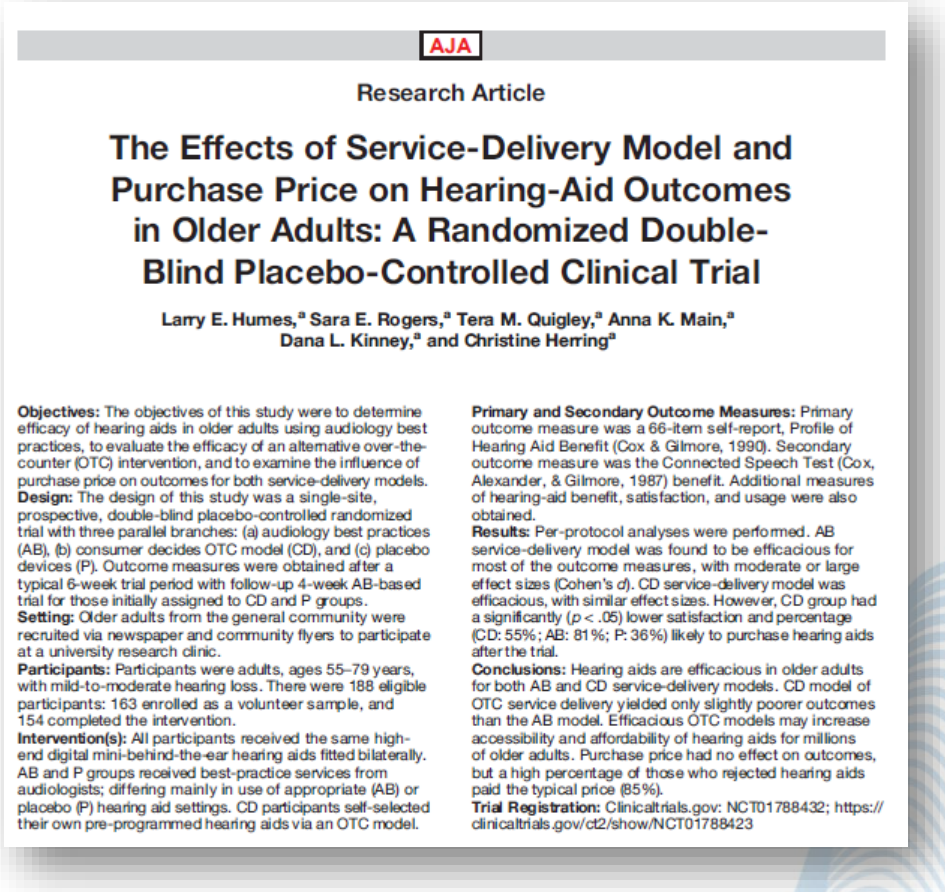
Importance of Verified Audibility – Real world

- Valente et al. (2018)
  - Double-blind randomized cross-over design
  - N = 24 New users; Mild to Mod losses
  - Fitted w/'Premium' RICs
    - REM (NAL-NL2) or Quick-Fit to Proprietary (~4 wks)
  - Verified NAL-NL2 fittings significantly better
    - Lab (e.g., speech recognition in quiet)
    - Real-world (e.g., APHAB)
    - Preference (19 of 24; **~ 80% preferred verified NL2 fitting**)

Valente, M et al. (2018). Differences in word and phoneme recognition in quiet, sentence recognition in noise, and subjective outcomes between manufacturer first-fit and hearing aids programmed to NAL-NL2 using real-ear measures. JAAA, 29(08), 706-721.

Effect of Service Delivery on Hearing Aid Outcomes

- 154 Older Adults; Mild-to-Mod SNHL
- Mini-BTE HI's (6 wk trial)
  - Best practice (BP) (REM, HAO)
  - OTC (no REM, no HAO)
  - Placebo (REUG, HAO)
- BP and OTC provided benefit
  - PHAB, CST, HHIE
- However,
  - BP higher satisfaction than OTC
  - BP more likely to purchase (81%) than OTC (55%)
  - Placebo purchased by 36%



AJA

Research Article

The Effects of Service-Delivery Model and Purchase Price on Hearing-Aid Outcomes in Older Adults: A Randomized Double-Blind Placebo-Controlled Clinical Trial

Larry E. Humes,[a] Sara E. Rogers,[a] Tera M. Quigley,[a] Anna K. Main,[a] Dana L. Kinney,[a] and Christine Herring[a]

Objectives: The objectives of this study were to determine efficacy of hearing aids in older adults using audiology best practices, to evaluate the efficacy of an alternative over-the-counter (OTC) intervention, and to examine the influence of purchase price on outcomes for both service-delivery models.
Design: The design of this study was a single-site, prospective, double-blind placebo-controlled randomized trial with three parallel branches: (a) audiology best practices (AB), (b) consumer decides OTC model (CD), and (c) placebo devices (P). Outcome measures were obtained after a typical 6-week trial period with follow-up 4-week AB-based trial for those initially assigned to CD and P groups.
Setting: Older adults from the general community were recruited via newspaper and community flyers to participate at a university research clinic.
Participants: Participants were adults, ages 55–79 years, with mild-to-moderate hearing loss. There were 188 eligible participants: 163 enrolled as a volunteer sample, and 154 completed the intervention.
Intervention(s): All participants received the same high-end digital mini-behind-the-ear hearing aids fitted bilaterally. AB and P groups received best-practice services from audiologists; differing mainly in use of appropriate (AB) or placebo (P) hearing aid settings. CD participants self-selected their own pre-programmed hearing aids via an OTC model.
Primary and Secondary Outcome Measures: Primary outcome measure was a 66-item self-report, Profile of Hearing Aid Benefit (Cox & Gilmore, 1990). Secondary outcome measure was the Connected Speech Test (Cox, Alexander, & Gilmore, 1987) benefit. Additional measures of hearing-aid benefit, satisfaction, and usage were also obtained.
Results: Per-protocol analyses were performed. AB service-delivery model was found to be efficacious for most of the outcome measures, with moderate or large effect sizes (Cohen's *d*). CD service-delivery model was efficacious, with similar effect sizes. However, CD group had a significantly ($p < .05$) lower satisfaction and percentage (CD: 55%; AB: 81%; P: 36%) likely to purchase hearing aids after the trial.
Conclusions: Hearing aids are efficacious in older adults for both AB and CD service-delivery models. CD model of OTC service delivery yielded only slightly poorer outcomes than the AB model. Efficacious OTC models may increase accessibility and affordability of hearing aids for millions of older adults. Purchase price had no effect on outcomes, but a high percentage of those who rejected hearing aids paid the typical price (85%).
Trial Registration: Clinicaltrials.gov: NCT01788432; https://clinicaltrials.gov/ct2/show/NCT01788423

Humes et al. (2017). Effects of service delivery model and purchase price on hearing aid outcomes in older adults…. American Journal of Audiology.

OTC: ‘Self-fit’ vs ‘Validated NAL-NL2’

		Best for subject based on NAL-NL2			
	Device / Setting	X	Y	Z	
Selected by subject	X	12	41	10	63
	Y	1	13	11	
	Z	2	8	4	
		15			

Adapted from Mueller (2017). 20Q: Hearing aid verification – can you afford not to? AudiologyOnline, Article 21716.

RESEARCH

Improving Patient Perception of Clinical Services Through Real-ear Measurements

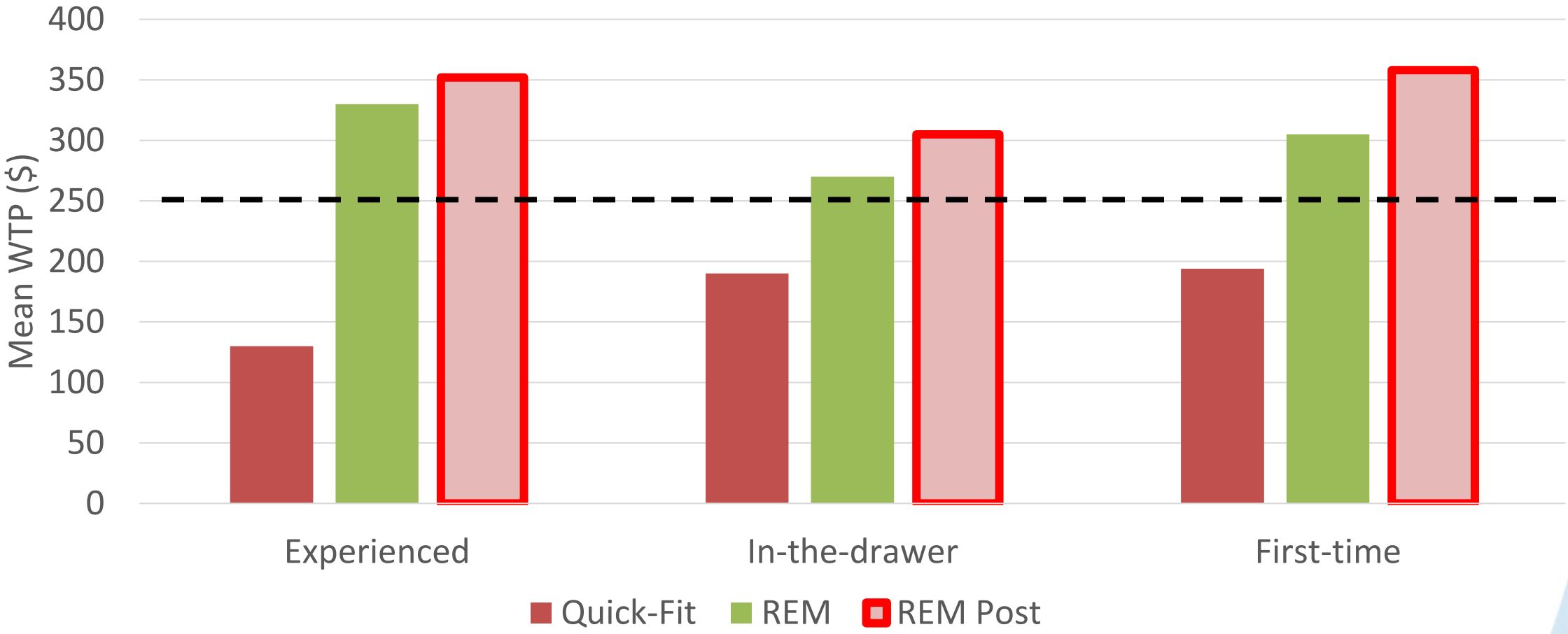
Published on November 22, 2016

Research | December 2016 *Hearing Review*

REM builds patient loyalty and is viewed as valuable to a wide range of patients

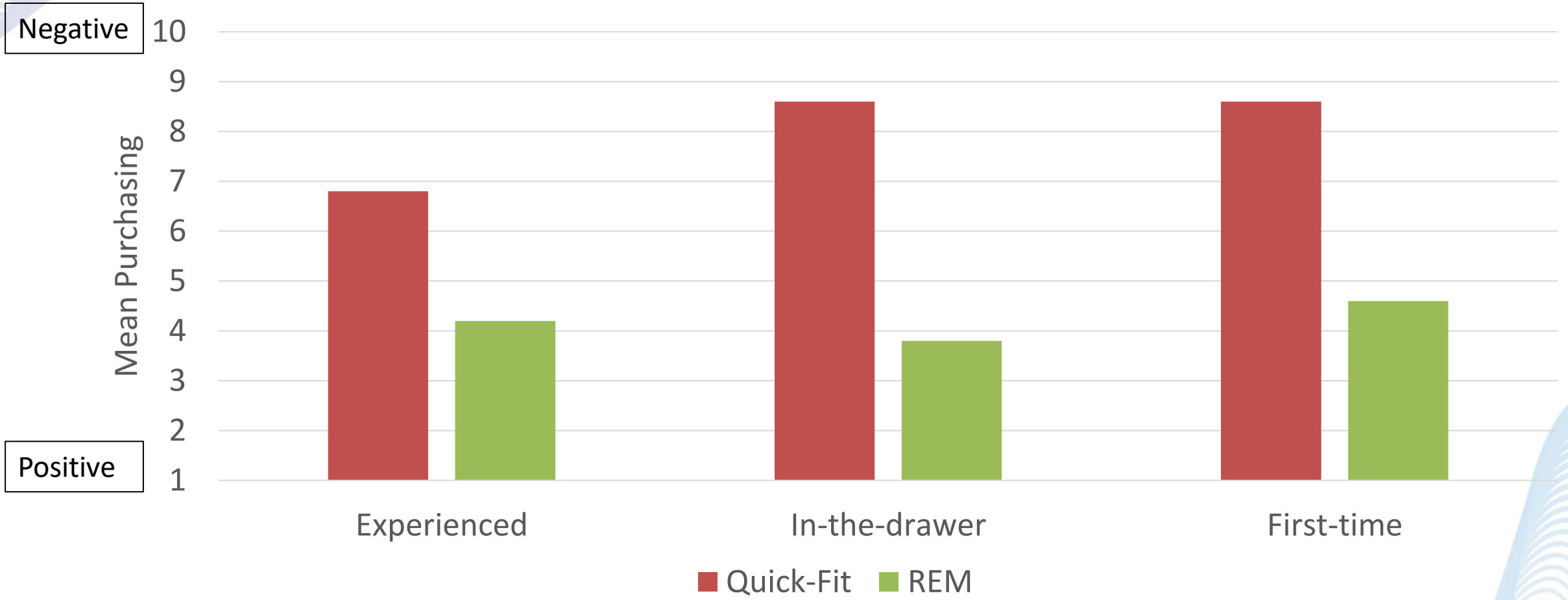
By Amyn M. Amlani, PhD, John Pumford, AuD, and Erich Gessling

Willingness-to-Pay



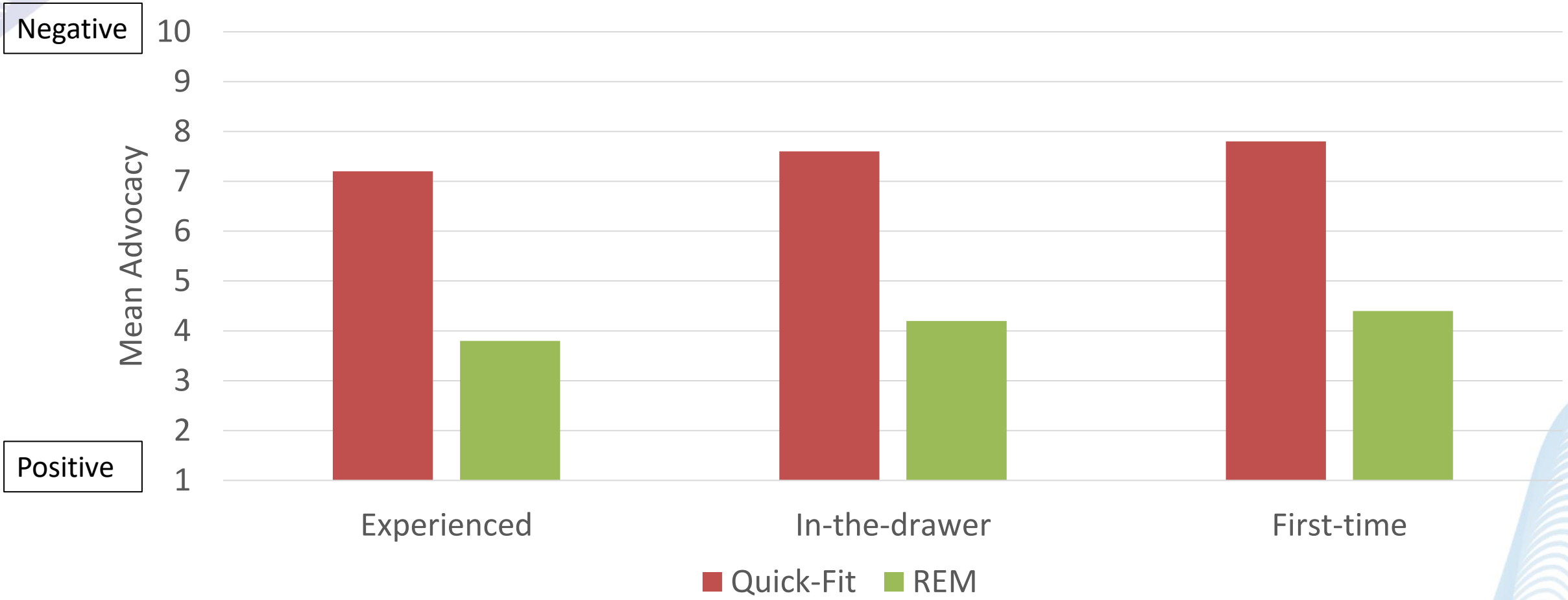
"The average cost to provide services for a hearing aid fitting is $250 per hour. Assuming no reimbursement assistance of any kind, how much would you be willing-to-pay for the services you were provided?"

Loyalty



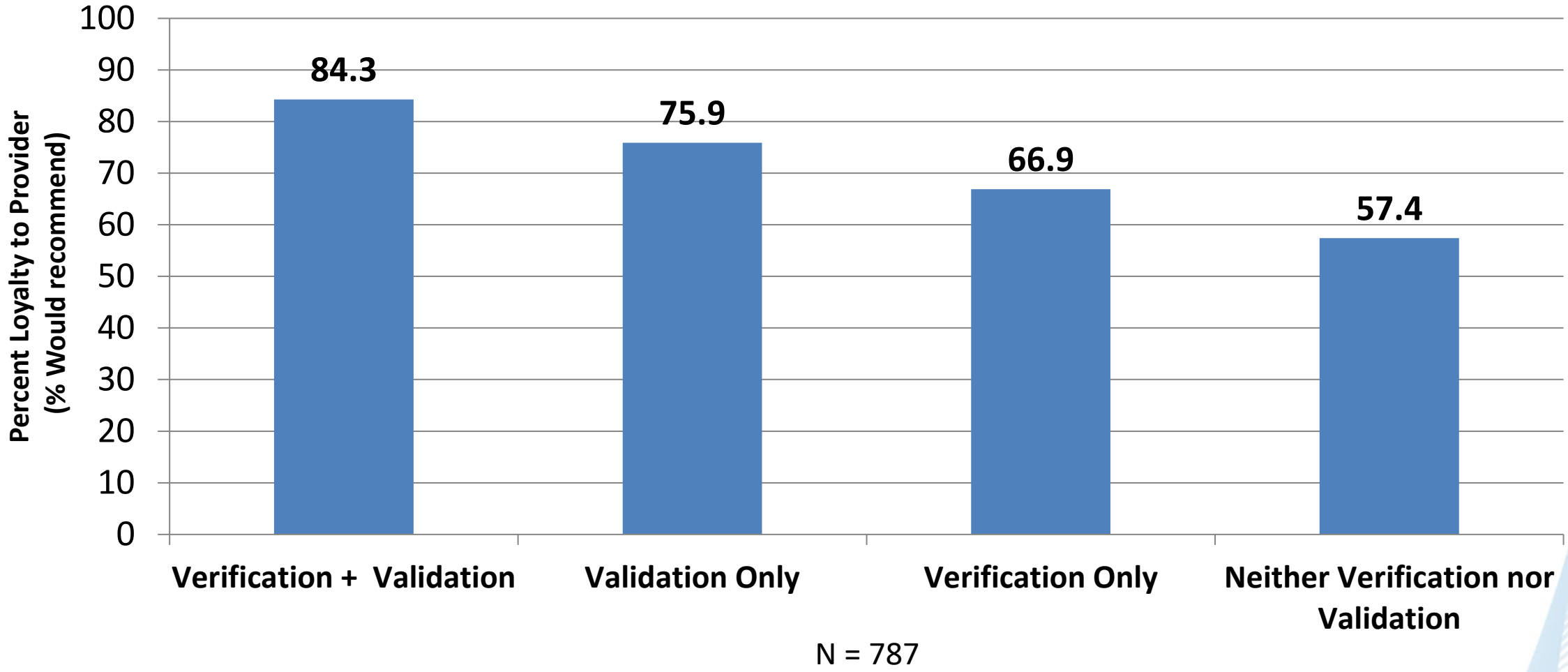
"What is the likelihood that you would expand your purchase of ***additional*** services offered by this provider?"

Loyalty



"What is the likelihood that you would recommend this provider to family and friends?"

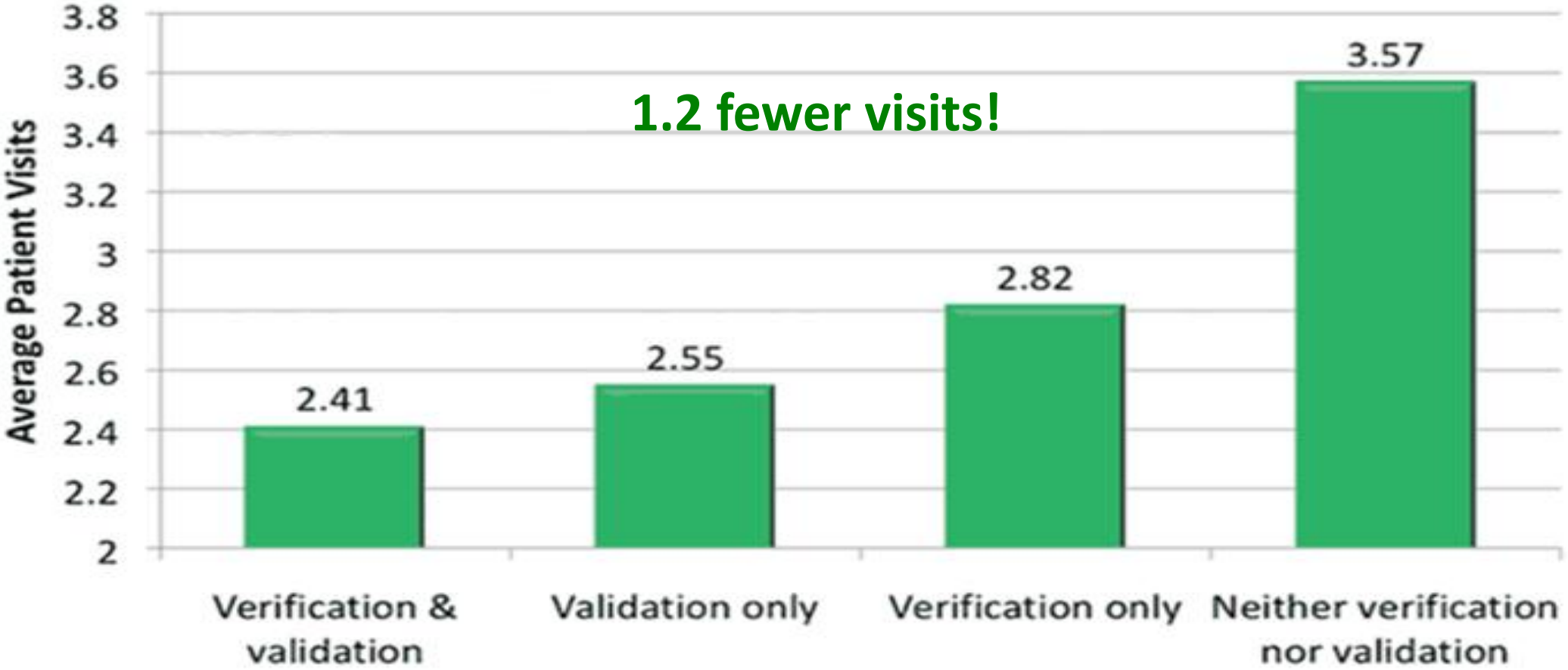
Best Practice and Patient Loyalty



N = 787

Bentler, Mueller and Ricketts (2016). Modern Hearing Aids. Adapted from Kochkin (2011).

Best Practice and Patient Visits



N = 787

Kochkin, S., "MarkeTrak VIII: Reducing Patient Visits Through Verification & Validation" Hearing Review, June, 2011

Build Practice Success

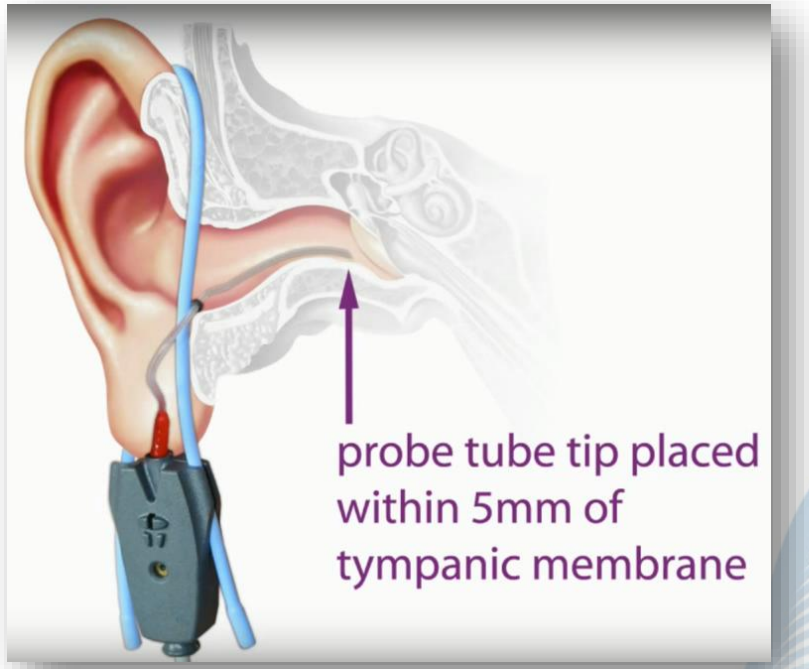
Verification has never been easier, more accurate or more efficient

Leverage Verification Efficiency Options

- Software-assisted Probe Tube Placement
- Automated Verification to Target (AutoREMfits)
- Pre-fitting devices via simulated REM (Test-Box)
- Simultaneous bilateral measurements
- Typical REM fitting < 10 mins

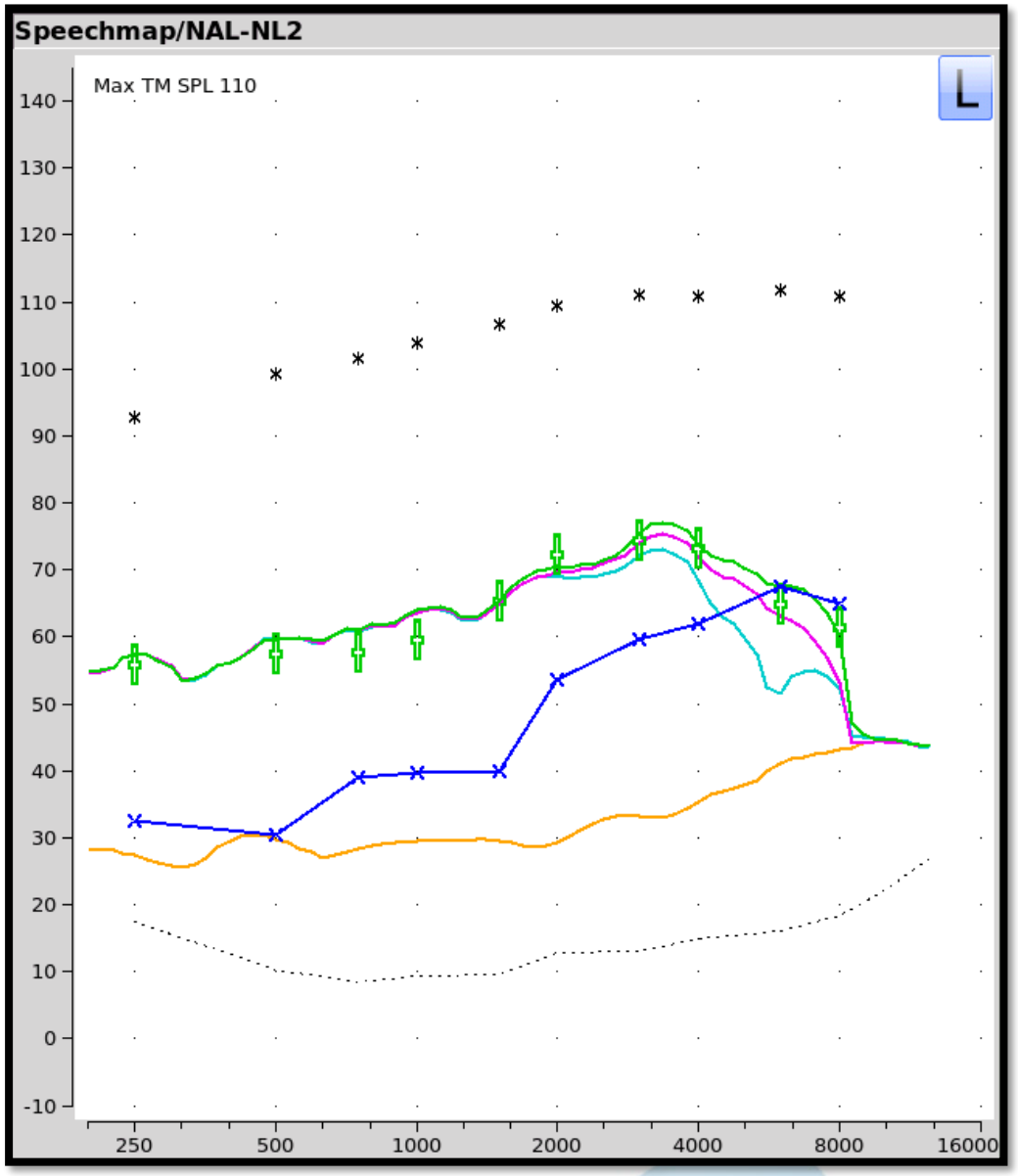
Probe Tube Placement

- Location near TM required for accuracy (~5mm)
- Minimizes contamination of ‘standing waves’
- Challenging
  - Too deep = patient discomfort
  - Too shallow = measurement error



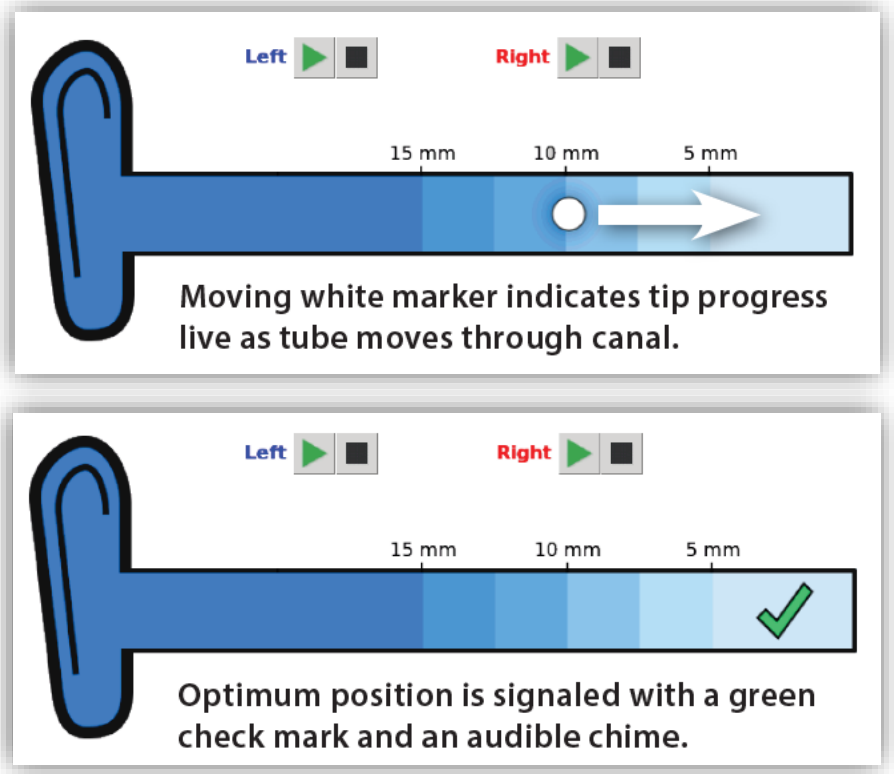
Impact of probe tube location

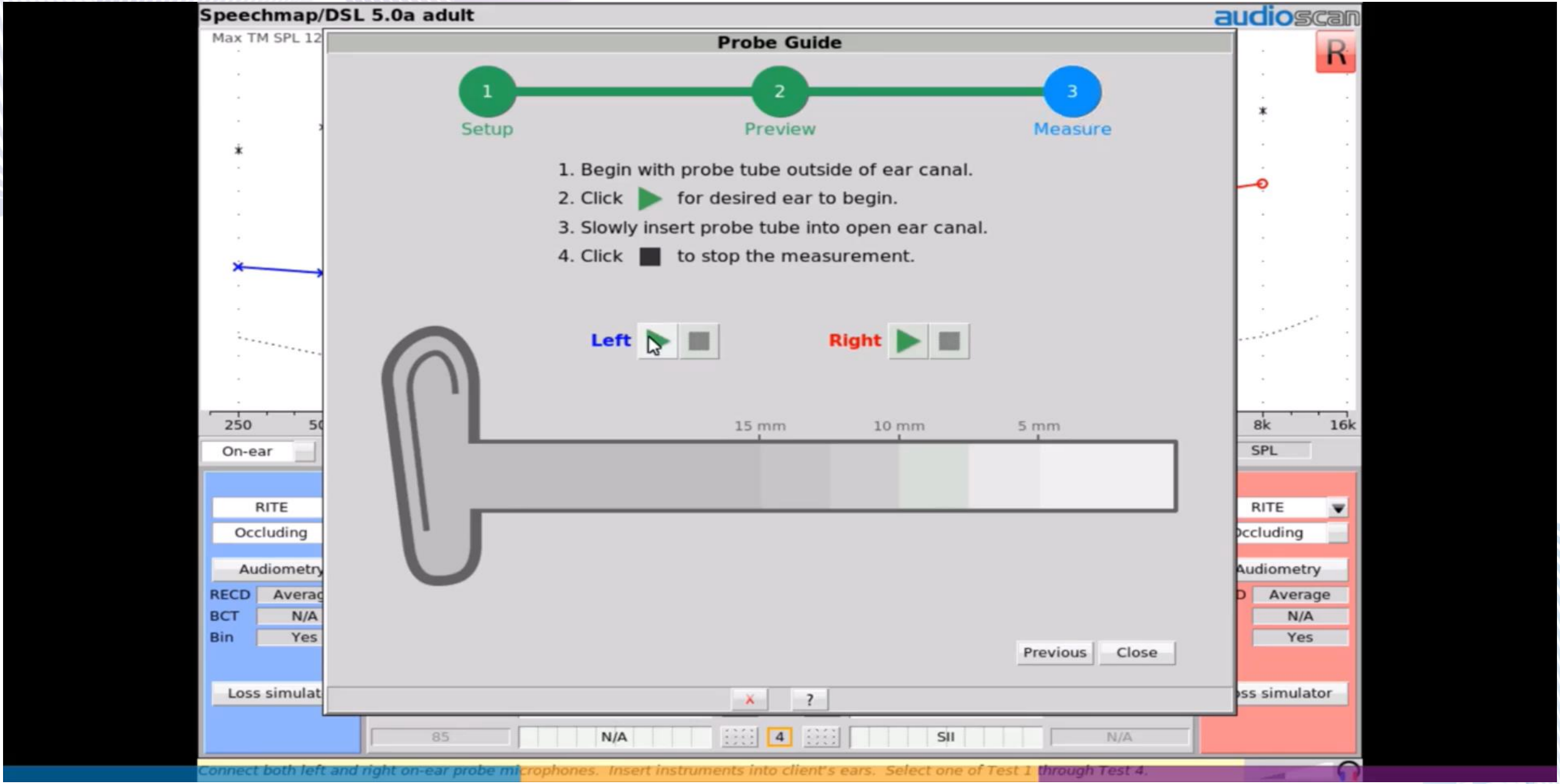
- **Green Curve** = within 5mm of TM
- **Purple Curve** = extracted ~ 5mm
- **Blue Curve** = extracted ~ 10 mm
- **Orange Curve** = fully plugged



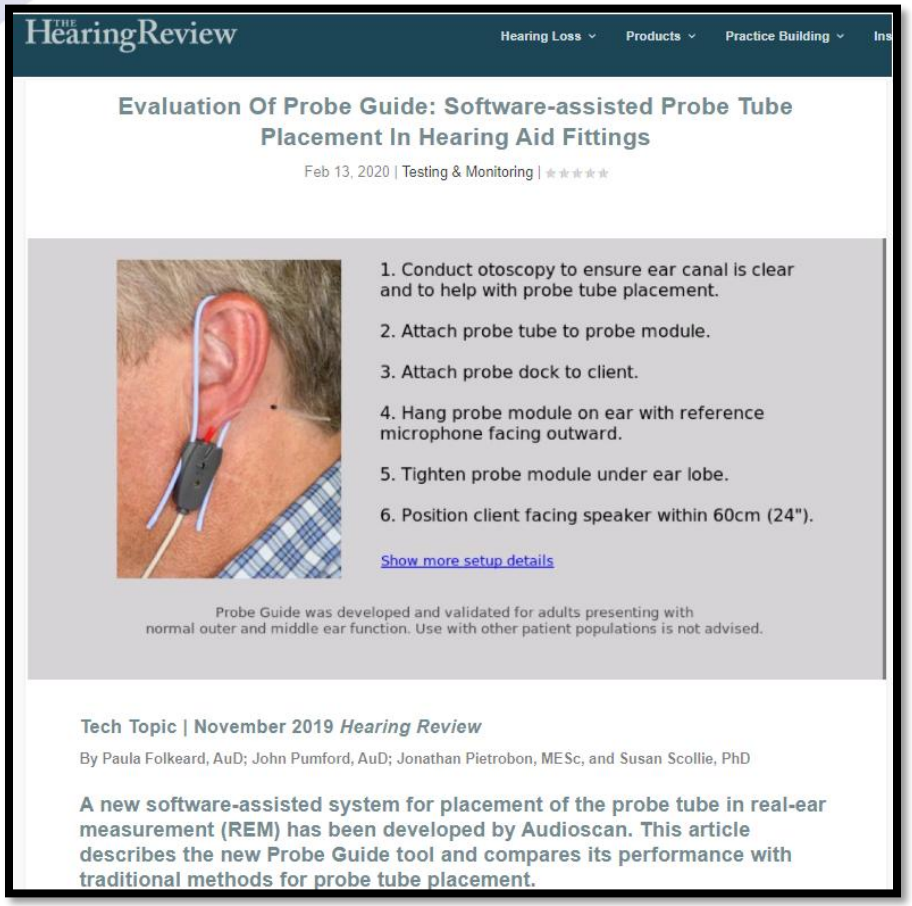
Probe*GUIDE*

- Software-assisted probe tube placement system
- Analyzes sound waves in ear canal to determine probe tube location & guide placement
- Real-time measures compared to acoustic model to indicate when probe tube ~ 5mm of TM





How well does it work?



The Hearing Review

Hearing Loss | Products | Practice Building | Ins

Evaluation Of Probe Guide: Software-assisted Probe Tube Placement In Hearing Aid Fittings

Feb 13, 2020 | Testing & Monitoring |

1. Conduct otoscopy to ensure ear canal is clear and to help with probe tube placement.
2. Attach probe tube to probe module.
3. Attach probe dock to client.
4. Hang probe module on ear with reference microphone facing outward.
5. Tighten probe module under ear lobe.
6. Position client facing speaker within 60cm (24").

Show more setup details

Probe Guide was developed and validated for adults presenting with normal outer and middle ear function. Use with other patient populations is not advised.

Tech Topic | November 2019 *Hearing Review*

By Paula Folkeard, AuD; John Pumford, AuD; Jonathan Pietrobon, MESc, and Susan Scollie, PhD

A new software-assisted system for placement of the probe tube in real-ear measurement (REM) has been developed by Audioscan. This article describes the new Probe Guide tool and compares its performance with traditional methods for probe tube placement.

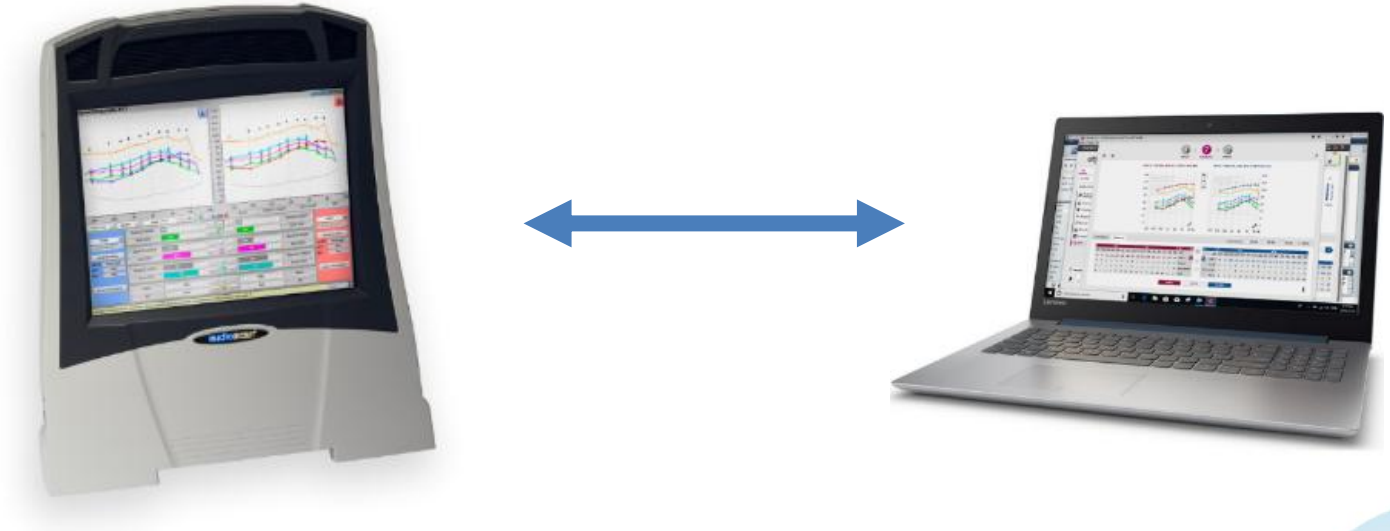
Key Takeaways

- PG equivalent to experienced clinician using typical visual method
  - Acoustic Measures
  - Marked Depth
  - Visual Inspection
  - Lack of Eardrum Contact

Folkeard P, Pumford J, Pietrobon J, Scollie S. Evaluation of Probe Guide: Software-assisted probe tube placement in hearing aid fittings. Hearing Review. 2019;26(11).

autoREMfits

- Automatically measure and adjust hearing aid to targets
- Fitting software and REM system exchange data
- Clinician conducts some initial background programming
- Actual programming of device to target done automatically



Some reasons to consider autoREMfits:

- Faster fit to target than manual
- Potential for improved target match
  - Unfamiliar products / software
  - Inexperienced verifiers

How well does it work?

THE Hearing Review

Replicating Nature with Signia Nx Own Vo
Signia Nx hearing aids with Own Voice Proc
the first genuine solution to the own voice is

NEWS PRODUCTS BUYER'S GUIDE RESOURCE CENTER BLOGS

TECH TOPIC

A Comparison of Automated Real-Ear and Traditional Hearing Aid Fitting Methods

Published on October 30, 2018

Tech Topic | November 2018 *Hearing Review*

By Paula Folkeard, AuD; John Pumford, AuD; Parvaneh Abbasalipour, MSc, Nicole Willis, and Susan Scollie, PhD

Several "autoREMfit" systems have been developed to assist in hearing aid fittings. This article evaluates a new fit-to-target platform, Audioscan's VerifitLINK, that could be integrated into any manufacturer's software, and documents its performance in target matching during hearing aid fitting.

Routine verification of aided hearing aid responses using real-ear measurements (REM) is part of recommended practice,[1-3] and failing to verify hearing aid fittings using this technique has been listed as the number one mistake made by clinicians.[4] Research has revealed positive listening outcomes for patients fitted using best practice REM verification versus first-fit approaches in both lab-based and real-world environments.[5-8]

Key Takeaways

- Better target match than quick fit
- Equivalent target match as experienced clinician using manual methods
- Less time to verify to target (~50% less)

Folkeard P, Pumford J, Abbasalipour P, Willis N, Scollie S. A comparison of automated real-ear and traditional hearing aid fitting methods. Hearing Review. 2018;25(11):28-32.

How well does it work?

Using autoREMfit for Hearing Aid Fitting and Verification: Evidence of Accuracy and Reliability

By JOHN PUMFORD, AuD, and H. GUSTAV MUELLER, PhD

This clinical study examines the new autoREMfit application of Audioscan VerifitLINK as integrated into Signia Connexx hearing aid fitting software. The results reveal good fit-to-target accuracy (RMSE ~2 dB; 65 dB SPL input) for two different audiograms and coupling systems. Test-retest reliability was excellent with no value greater than 1 dB at any frequency. Clinical benefits of this autoREMfit collaboration are discussed.

Certainly one of the most critical aspects related to the fitting and dispensing of hearing aids (HA) is ensuring that the gain and output have been optimized for a given user across frequencies. While to some extent, this is patient-specific, we do know that on average, the best starting point is a validated prescriptive fitting method, such as the NAL-NL2[1] or the DSLv5.0.[2] Research has shown that a verified fitting to either of these validated generic fitting formulas will provide increased benefit when compared to alternative choices, such as the manufacturers' proprietary fittings in both adults and pediatrics (see Mueller, Ricketts, and Bentler[3] for a review). Clinical studies have also shown that the manufacturers' versions of these validated generic fitting formulas typically do not result in targeted behavior in the real-ear (including when there is a perfect match to target displayed by the software simulated output).[4,5]

This evidence leads to the logical conclusion that real-ear probe-microphone verification is necessary for all hearing aid fittings.

Probe-microphone (aka real-ear) measures, as we know them today, have been clinically available for 35 years. The use of this verification approach has been part of all clinical guidelines from professional organizations that have been written since that time. Some documents, in fact, go so far as to state what frequency-specific dB deviations from prescriptive targets are allowable.[6,7] Despite the logical need for real-ear verification, and the support from professional organizations, many hearing care providers (HCPs) do not conduct this testing at all, or do not use it to verify prescriptive targets. Surveys from past years indicate that probably no more than 30-40% of HCPs fitting hearing aids routinely conduct probe-mic measures, and many who do, do not use them for validating prescriptive targets.[8,9]

There are many reasons why verification to prescriptive targets is not a routine practice (see Mueller et al[2] for discussion). It is tempting to think that ownership of the equipment is a major factor. This doesn't appear to be true, as examined in the Mueller and Picou survey.[8] We can, however, come up with several possible reasons why these disparate findings exist, including: the perceived complexity of the hearing aid programming that would be involved, the HCP is not skilled in probe-mic techniques and procedures, and/or the real-ear fit-to-target process is perceived as too time consuming.

To address in part these issues, hearing aid and real-ear equipment manufacturers have partnered to develop an automated method for fitting to prescriptive targets, which we'll refer to as autoREMfit (each company tends to have their own name for the procedure; see Mueller and Ricketts for a review[10]). AutoREMfit isn't something new; it has been around for 20 years,[11] but there recently has been an increased interest.

In principle, with autoREMfits, the hearing aid manufacturers' software exchanges measurement and control data with the verification equipment, assessing the difference between the real-time measured output and the desired (target) output to make HA programming adjustments until a match to target is obtained. The HCP still has to make some pre-fitting decisions in the HA fitting software, ensure that the patient is seated correctly and the probe tube placement is appropriate, but the fit-to-target itself is automatic. Today, there are at least five different verification equipment companies that have partnered with four leading hearing aid manufacturers (and their affiliates) to develop an autoREMfit option.[12] Overall, research with these different autoREMfit approaches has shown them to be reasonably accurate and reliable.[13-16]

As reviewed by Mueller,[12] there are several potential advantages to using autoREMfit. First, the fit-to-target most likely is faster than that accomplished with traditional HCP programming, even for an experienced provider.[14,15] For someone who is new to programming hearing aids, the autoREMfit is likely more accurate and consistent than the HCP-fit. The procedure also comes in handy when the need arises to program hearing aids that the HCP normally doesn't work with. Finally, the automated procedure is indeed impressive, and could be used as a sales tool, helping to ensure patient confidence in the fitting.

There are, however, some potential concerns.[10] Some autoREMfit implementations fit only to the REIG, not to output targets (ie, the REAR), some systems only fit to average-level inputs, and several autoREMfit systems use the prescriptive targets from the HA fitting software, not those of the verification

John Pumford, AuD, is Director of audiology and education at Audioscan, Dorchester, Ontario, and **H. Gustav (Gus) Mueller, PhD**, has faculty appointments at Vanderbilt, Rush, and Northern Colorado Universities, and is Contributing Editor at AudiologyOnline. His home office is in Bismarck, ND.

Key Takeaways

- Better target match than quick fit
- Good fit to target accuracy (RMSE ~2dB) for 2 different audiograms / couplings (open and closed)
- Excellent test-retest reliability (<=1 dB)

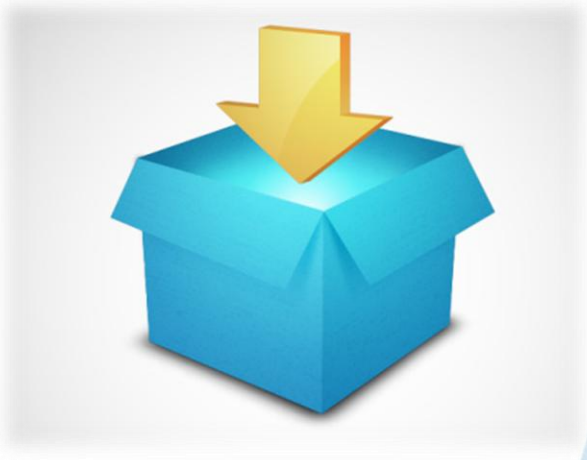
Pumford J, Mueller HG. Using autoREMfit for hearing aid fitting and verification: Evidence of accuracy and reliability. Hearing Review. 2020;27(8):24-27.

Pre-Fitting in the Test Box

Simulated Real-Ear Measurements (S-REM)

Benefit of Speechmap Test Box (Simulated REM)

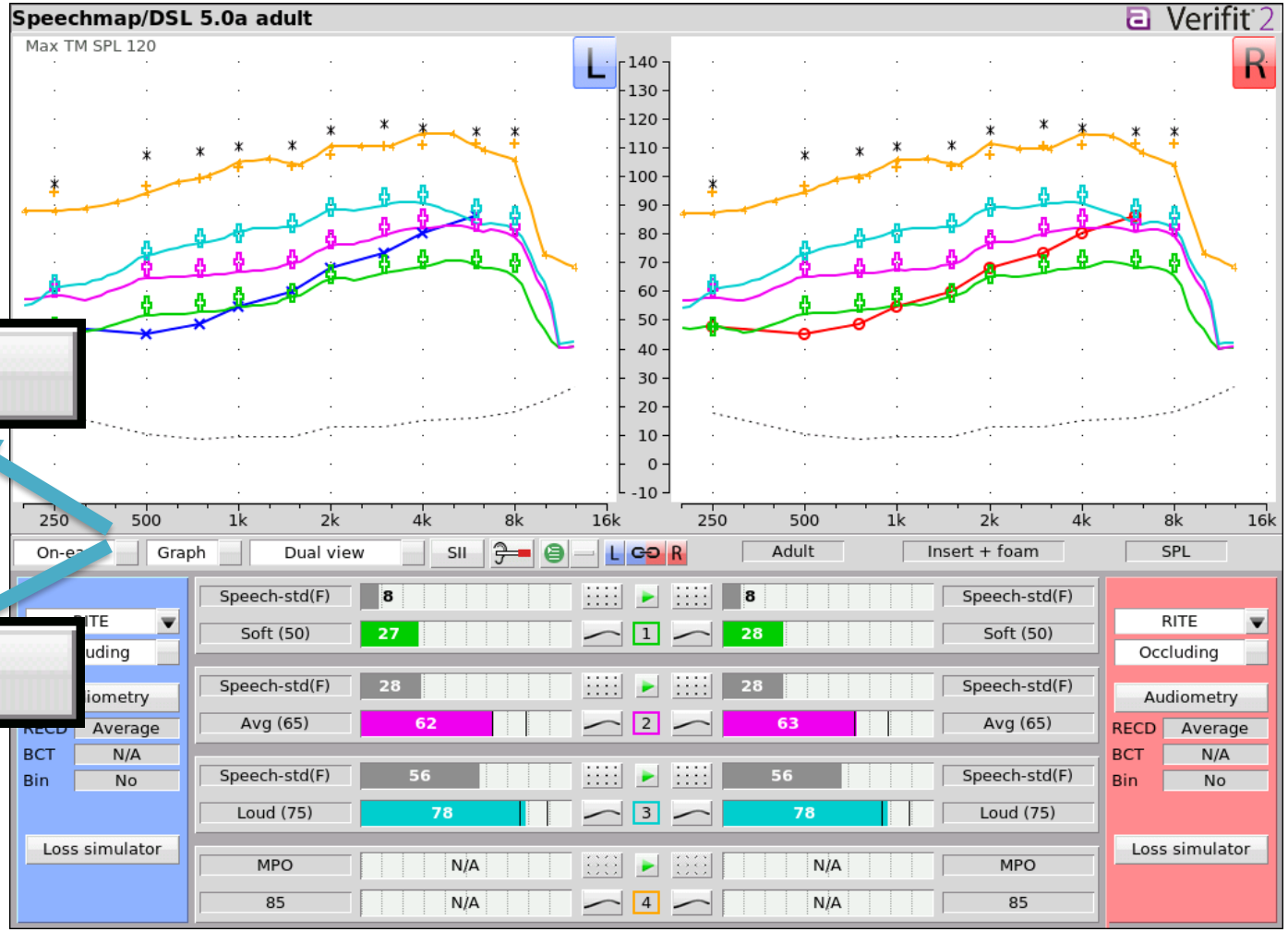
- Program devices to target without the patient



Same Speechmap, just in the box

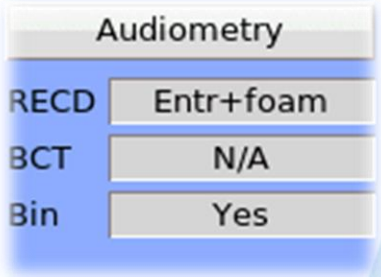
On-ear

Test box

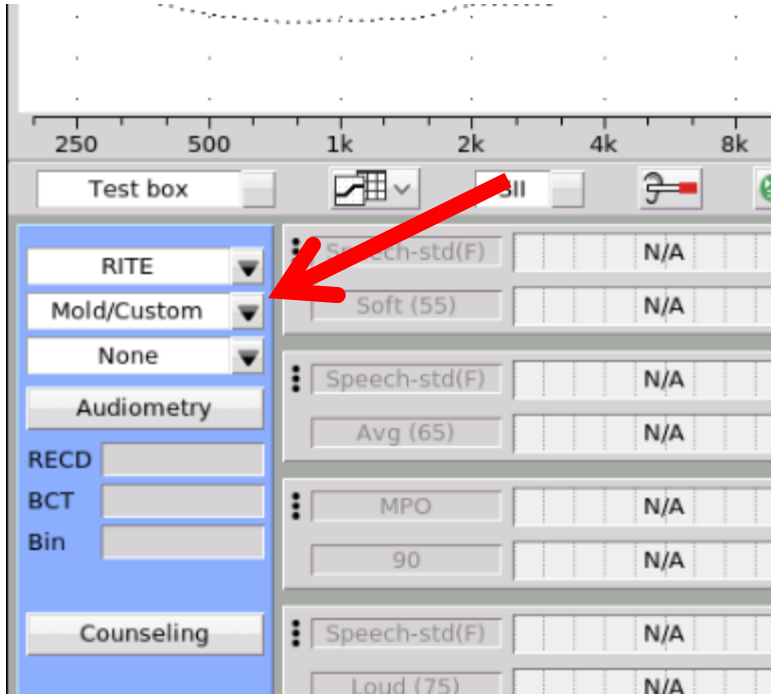


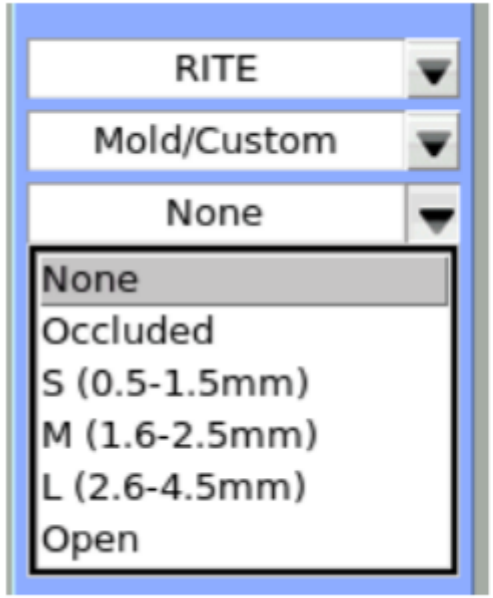
Instrument type-specific MLE added to input signal

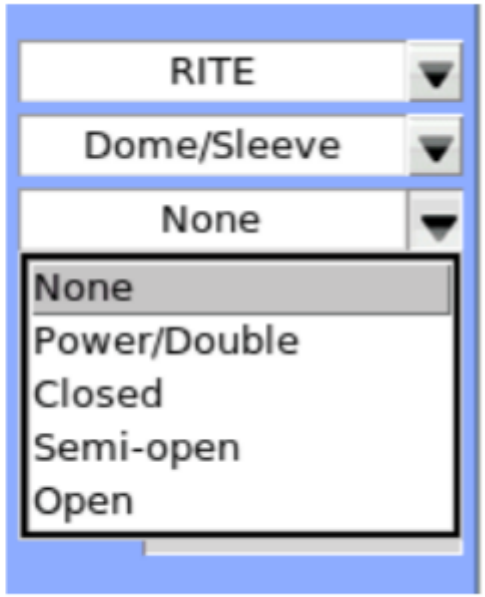
Patient-specific RECD added to coupler measurement

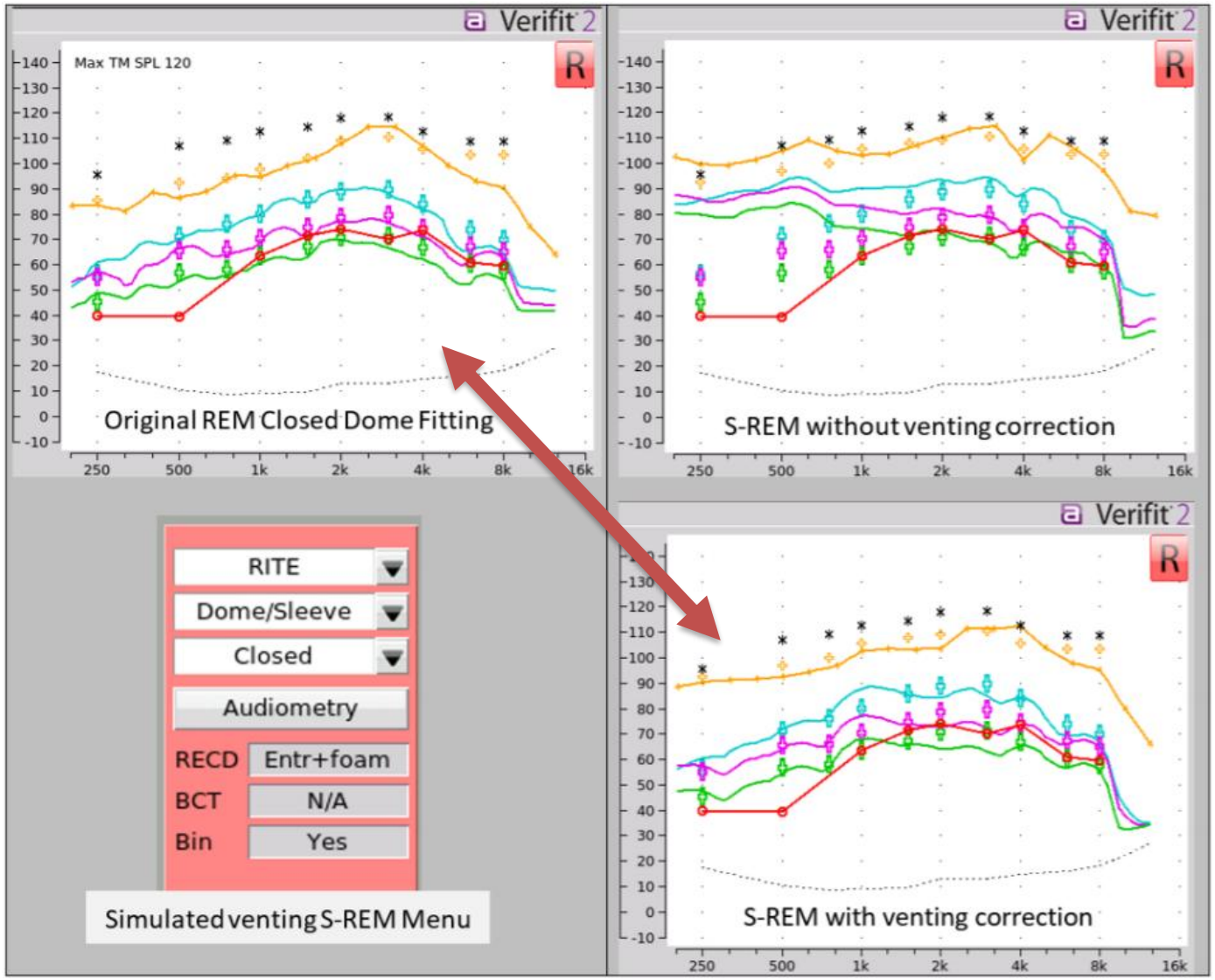


Venting Corrections in S-REM

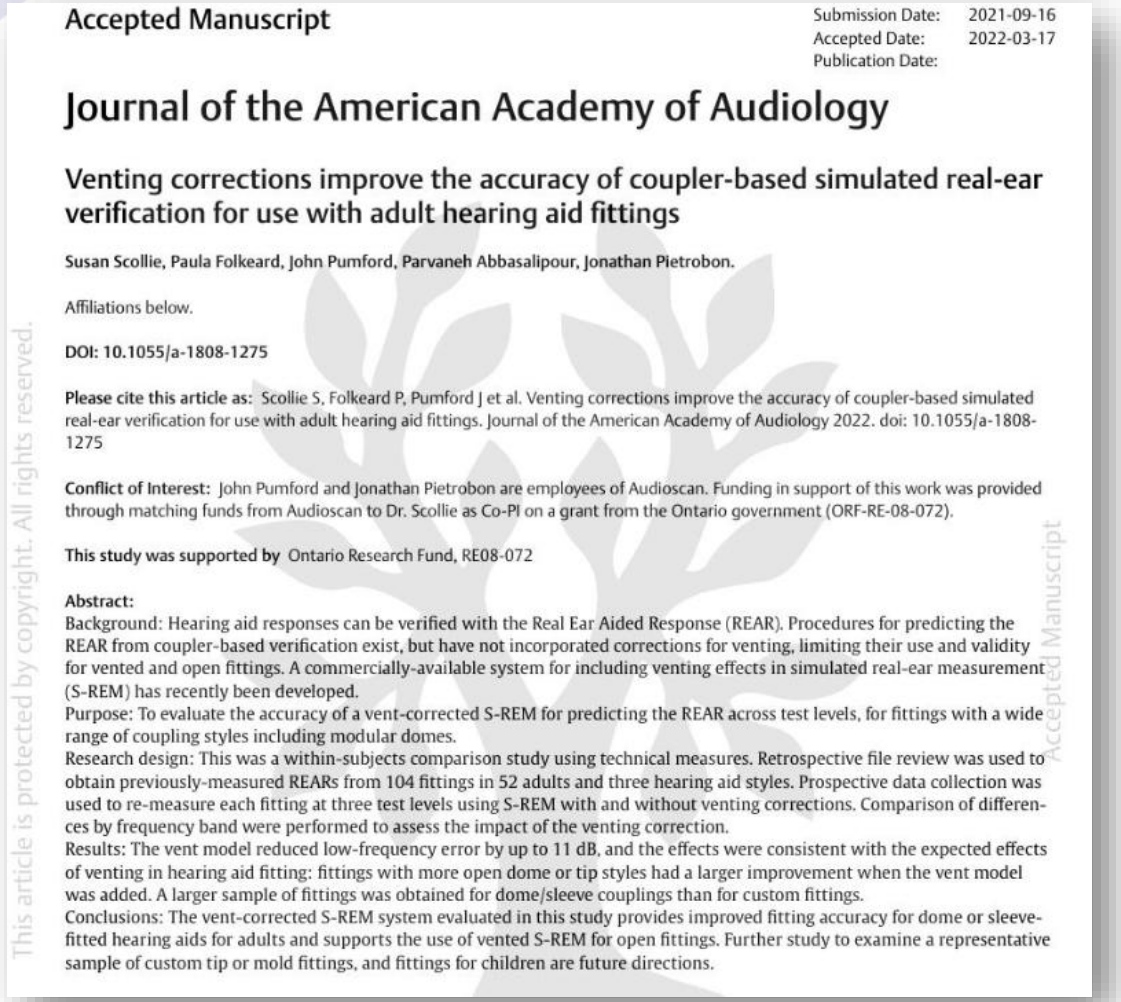








How well does it work?



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Venting corrections improve the accuracy of coupler-based simulated real-ear verification for use with adult hearing aid fittings

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Abstract:
Background: Hearing aid responses can be verified with the Real Ear Aided Response (REAR). Procedures for predicting the REAR from coupler-based verification exist, but have not incorporated corrections for venting, limiting their use and validity for vented and open fittings. A commercially-available system for including venting effects in simulated real-ear measurement (S-REM) has recently been developed.
Purpose: To evaluate the accuracy of a vent-corrected S-REM for predicting the REAR across test levels, for fittings with a wide range of coupling styles including modular domes.
Research design: This was a within-subjects comparison study using technical measures. Retrospective file review was used to obtain previously-measured REARs from 104 fittings in 52 adults and three hearing aid styles. Prospective data collection was used to re-measure each fitting at three test levels using S-REM with and without venting corrections. Comparison of differences by frequency band were performed to assess the impact of the venting correction.
Results: The vent model reduced low-frequency error by up to 11 dB, and the effects were consistent with the expected effects of venting in hearing aid fitting: fittings with more open dome or tip styles had a larger improvement when the vent model was added. A larger sample of fittings was obtained for dome/sleeve couplings than for custom fittings.
Conclusions: The vent-corrected S-REM system evaluated in this study provides improved fitting accuracy for dome or sleeve-fitted hearing aids for adults and supports the use of vented S-REM for open fittings. Further study to examine a representative sample of custom tip or mold fittings, and fittings for children are future directions.

Scollie, Folkeard, Pumford, Abbasalipour, Pietrobon (2022). Venting corrections improve the accuracy of coupler-based simulated real-ear verification for use with adult hearing aid fittings. JAAA. doi: 10.1055/a-1808-1275.

Key Takeaways

- Vent correction significantly improved accuracy of S-REM prediction of REM
- Particularly in LF's, average error reduced by ~ 10-15 dB for semi-open, open and vented earmold styles

Build Practice Success

Verification workflow considerations with direct-to-consumer hearing devices

FDA OTC Final Rule and Verification

ANSI/CTA - 2051

- “PSAP Performance Criteria”
- Specifies Device Performance (Pass / Fail)

ANSI s3.22-2014

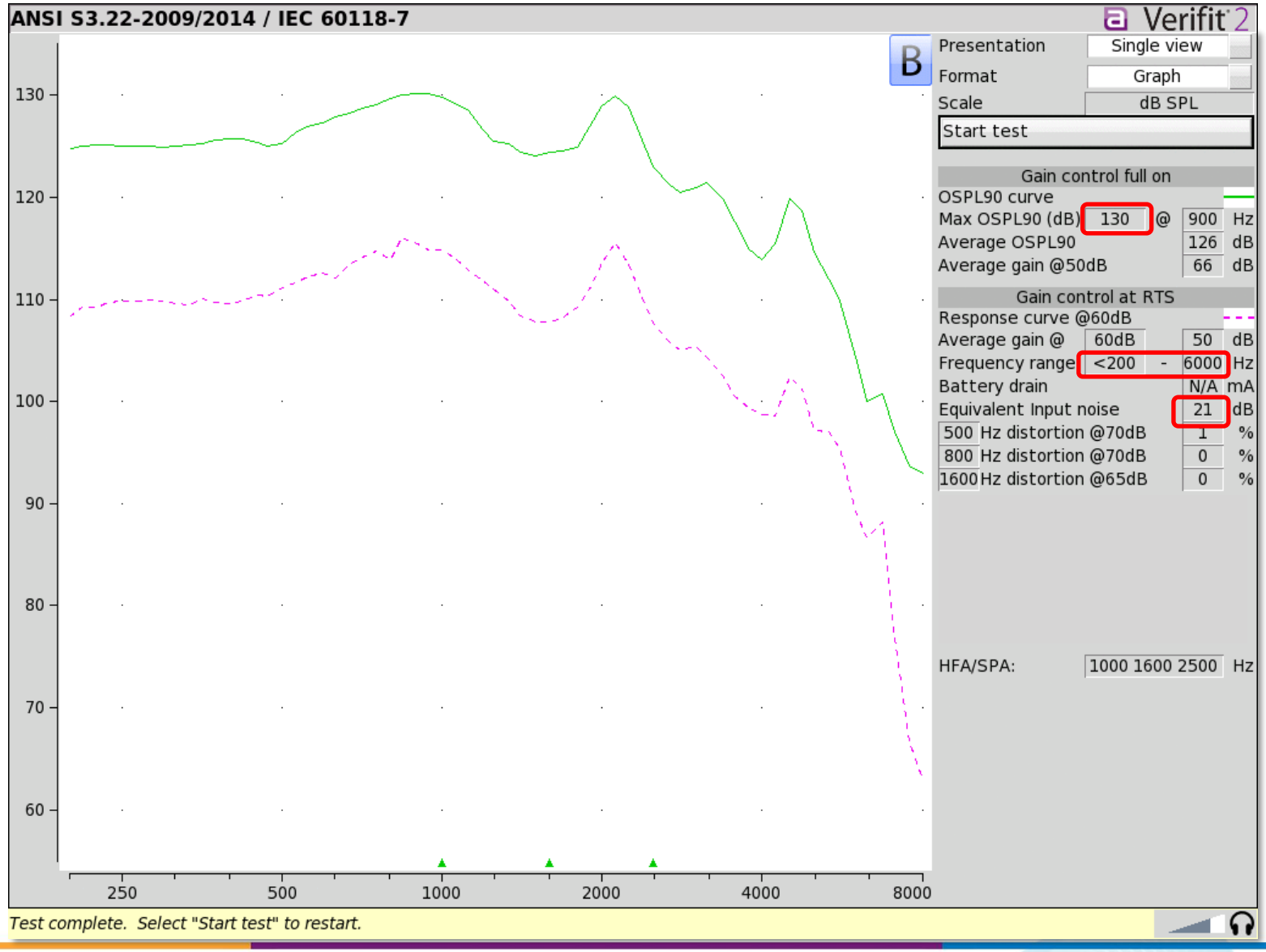
- “Specification of Hearing Aid Characteristics”
- Specifies Test Methods and Tolerances

FDA OTC Final Rule – Technical Requirements

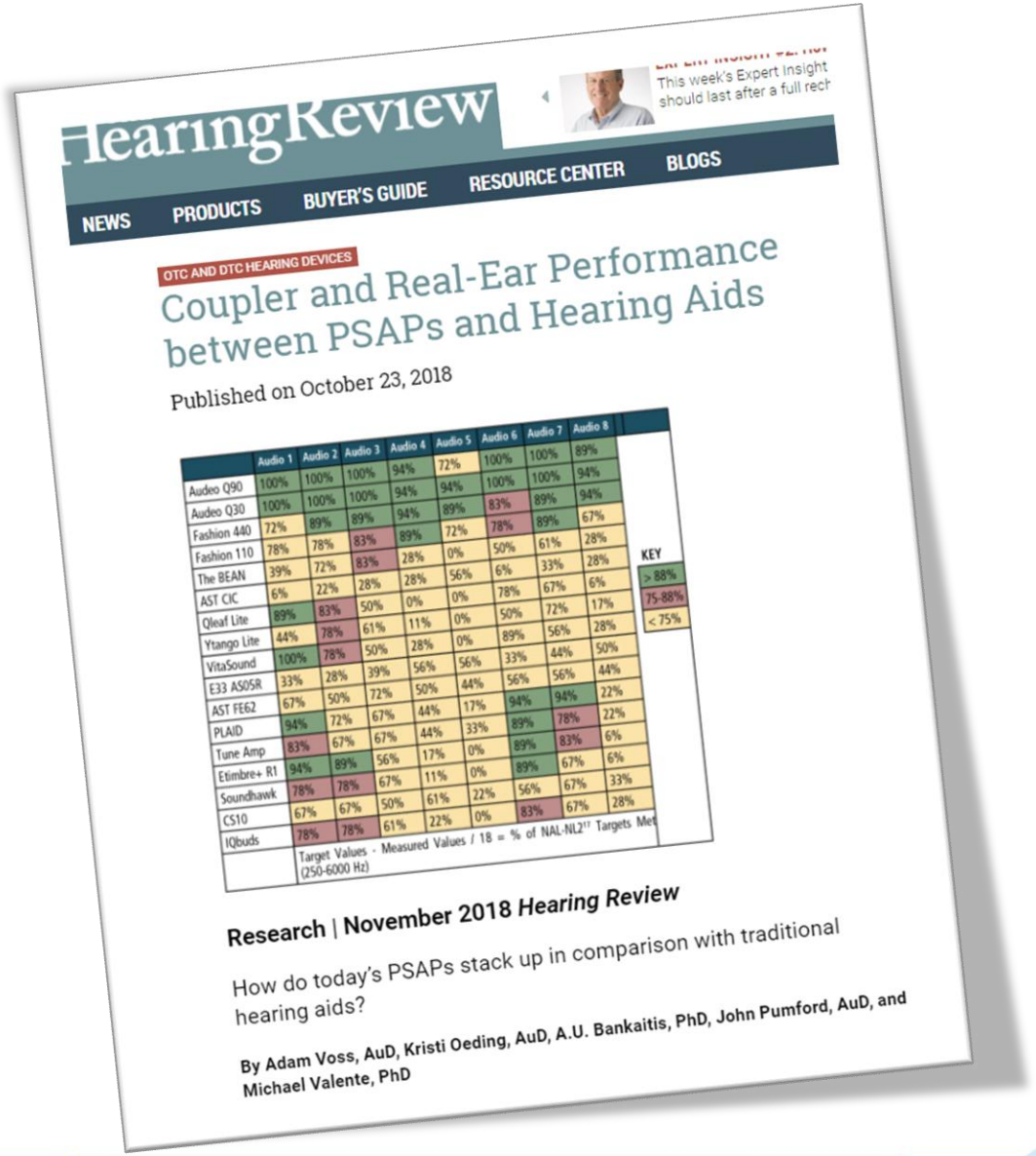
- Information must appear in user documentation

Measure	Requirement
Maximum output (OSPL90)	Not greater than 111 dB SPL peak (General) Not greater than 117 dB SPL peak (IC active)
Full-on gain (FOG50)	No limit
Total Harmonic Distortion (THD)	Not greater than 5%
Self-generated (internal) noise	Not greater than 32 dBA
Bandwidth	<=250 Hz up to 5000 Hz or greater
Latency	Not greater than 15 msec
Smoothness (Frequency response)	No peak in 1/3rd octave > 12 dB above average levels of adjacent 1/3rd octaves…

Now: ANSI Test



But what about audibility?



HearingReview

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This week's Expert Insight should last after a full rech

OTC AND DTC HEARING DEVICES

Coupler and Real-Ear Performance between PSAPs and Hearing Aids

Published on October 23, 2018

	Audio 1	Audio 2	Audio 3	Audio 4	Audio 5	Audio 6	Audio 7	Audio 8
Audeo Q90	100%	100%	100%	94%	72%	100%	100%	89%
Audeo Q30	100%	100%	100%	94%	94%	100%	100%	94%
Fashion 440	72%	89%	89%	94%	89%	83%	89%	94%
Fashion 110	78%	78%	83%	89%	72%	78%	89%	67%
The BEAN	39%	72%	83%	28%	0%	50%	61%	28%
AST CIC	6%	22%	28%	28%	56%	6%	33%	28%
Qleaf Lite	89%	83%	50%	0%	0%	78%	67%	6%
Ytango Lite	44%	78%	61%	11%	0%	50%	72%	17%
VitaSound	100%	78%	50%	28%	0%	89%	56%	28%
E33 AS05R	33%	28%	39%	56%	56%	33%	44%	50%
AST FE62	67%	50%	72%	50%	44%	56%	56%	44%
PLAID	94%	72%	67%	44%	17%	94%	94%	22%
Tune Amp	83%	67%	67%	44%	33%	89%	78%	22%
Etimbre+ R1	94%	89%	56%	17%	0%	89%	83%	6%
Soundhawk	78%	78%	67%	11%	0%	89%	67%	6%
CS10	67%	67%	50%	61%	22%	56%	67%	33%
IQbuds	78%	78%	61%	22%	0%	83%	67%	28%

Target Values - Measured Values / 18 = % of NAL-NL2[17] Targets Met (250-6000 Hz)

KEY
> 88%
75-88%
< 75%

Research | November 2018 *Hearing Review*

How do today's PSAPs stack up in comparison with traditional hearing aids?

By Adam Voss, AuD, Kristi Oeding, AuD, A.U. Bankaitis, PhD, John Pumford, AuD, and Michael Valente, PhD

Procedure:

- Evaluated a range of Hearing Aids and PSAPs re: target match capability
- Devices adjusted for best NAL-NL2 REAR target match
  - Soft (50) & Average (65) speech
- Determined % of total targets within +/- 5 dB from 250 – 6000 Hz

Concluded:

- Hearing Aids able to meet targets (suitable) for a range of hearing losses
- Most PSAPs able to meet targets (suitable) for only slight to mild hearing losses
- These OTC-like devices would not meet stated criteria that are suitable for mild to <u>moderate</u> losses

% of NAL-NL2 Targets Met

		Flat-Moderately Sloping				
DEVICE	CATEGORY	VERY MILD	MILD	MODERATE	MODERATE-SEVERE	SEVERE
Phonak Audeo Q30 312	ENTRY LEVEL Hearing Instrument	100%	100%	100%	94%	94%
Phonak Audeo Q90 312T	PREMIUM Hearing Instrument	100%	100%	100%	94%	72%
Widex Unique Fashion 440	PREMIUM Hearing Instrument	78%	89%	89%	94%	89%
Widex Unique Fashion 110	ENTRY LEVEL Hearing Instrument	78%	78%	83%	89%	72%
AST Etimbre+ R1	INTERMEDIATE PSAP	94%	89%	56%	17%	0%
Plaid	INTERMEDIATE PSAP	94%	72%	67%	44%	17%
VitaSound	BASIC PSAP	100%	78%	50%	28%	0%
Soundhawk*	ADVANCED PSAP	78%	78%	67%	11%	0%
Nuheara IQbuds	ADVANCED PSAP	78%	78%	61%	22%	0%
ExSilent Qleaf Lite	BASIC PSAP	89%	83%	50%	0%	0%
ExSilent YTango Lite	BASIC PSAP	44%	78%	61%	11%	0%
Tune Amp Tweak	INTERMEDIATE PSAP	83%	67%	67%	44%	33%
Etymotic Bean	BASIC PSAP	39%	72%	83%	28%	0%
Sound World Solutions CS10	ADVANCED PSAP	67%	67%	50%	61%	22%
Austar AST Finner Group CIC*	BASIC PSAP	6%	22%	28%	28%	56%
AST E33 Rechargeable	INTERMEDIATE PSAP	33%	28%	39%	56%	56%
Austar AST FE62*	INTERMEDIATE PSAP	67%	50%	72%	50%	44%

Adapted from oaktreeproducts.com/psap-probe-mic-performance

What to consider…

- Establish objective vetting procedure for OTCs to identify possible devices for adults w/mild to moderate HL
- Establish off-the-shelf OTC purchase procedure distinguishable from traditional hearing aid dispensing models
- Establish an OTC servicing plan for current and new patients (i.e., OTC purchased elsewhere) with clear fee schedule for services

Bankaitis (2017). Our role in this disruptive environment – clinical and business practice issues. AudiologyOnline. Course #30085.

Mock example for including OTCs

OTC	Low	Mid	High
Choosing device	Choosing device	Choosing device	Choosing device
Expectation / uses	Programming – minimal features	Programming – several features	Programming – many features
[Basic Verification (ANSI)]	Verification	Verification	Verification
Orientation – insertion, removal, battery, cleaning	Pre-fit subjective outcome measure	Pre-fit subjective outcome measure	Pre-fit subjective outcome measure
~ 20 minute fitting	Orientation, expectation, trial period, care/use	Orientation, expectation, trial period, care/use	Orientation, expectations, trial period, care/use
Audiology Assistant	Cost = device + orientation + verification + programming	Cost = device + orientation + verification + programming	Cost = device + orientation + verification + programming
Cost = device + orientation	e.g., ($450x2) + $1500 = $2400	e.g., ($850x2) + $1500 = $3200	e.g., ($1300x2) + $1500 = $4100
e.g., ($400x2) + 50 = $650			

Adapted from Palmer, C. (2018, January). Signia Expert Series: Over-the-counter hearing aids - opportunity or disaster? *AudiologyOnline*, Article 21066

Going Forward…

- The future impact of OTCs on the existing professional care environment is unclear
- Verification is a valuable clinical service we can use today to engage with prescription hearing aids and OTC devices

Summary

- Research and professional guidelines support the value of verification for patients and providers
- New verification tools can make the process easier and more efficient
- Verification services can be included in your workflow with traditional and OTC devices
- Verification services highlight clinician value in addressing hearing healthcare needs and support practice success

Thank You

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