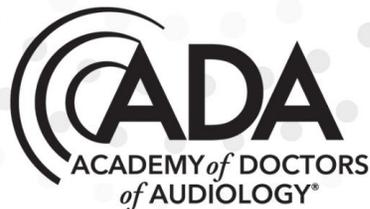


AUDACITY

Bolder than Ever



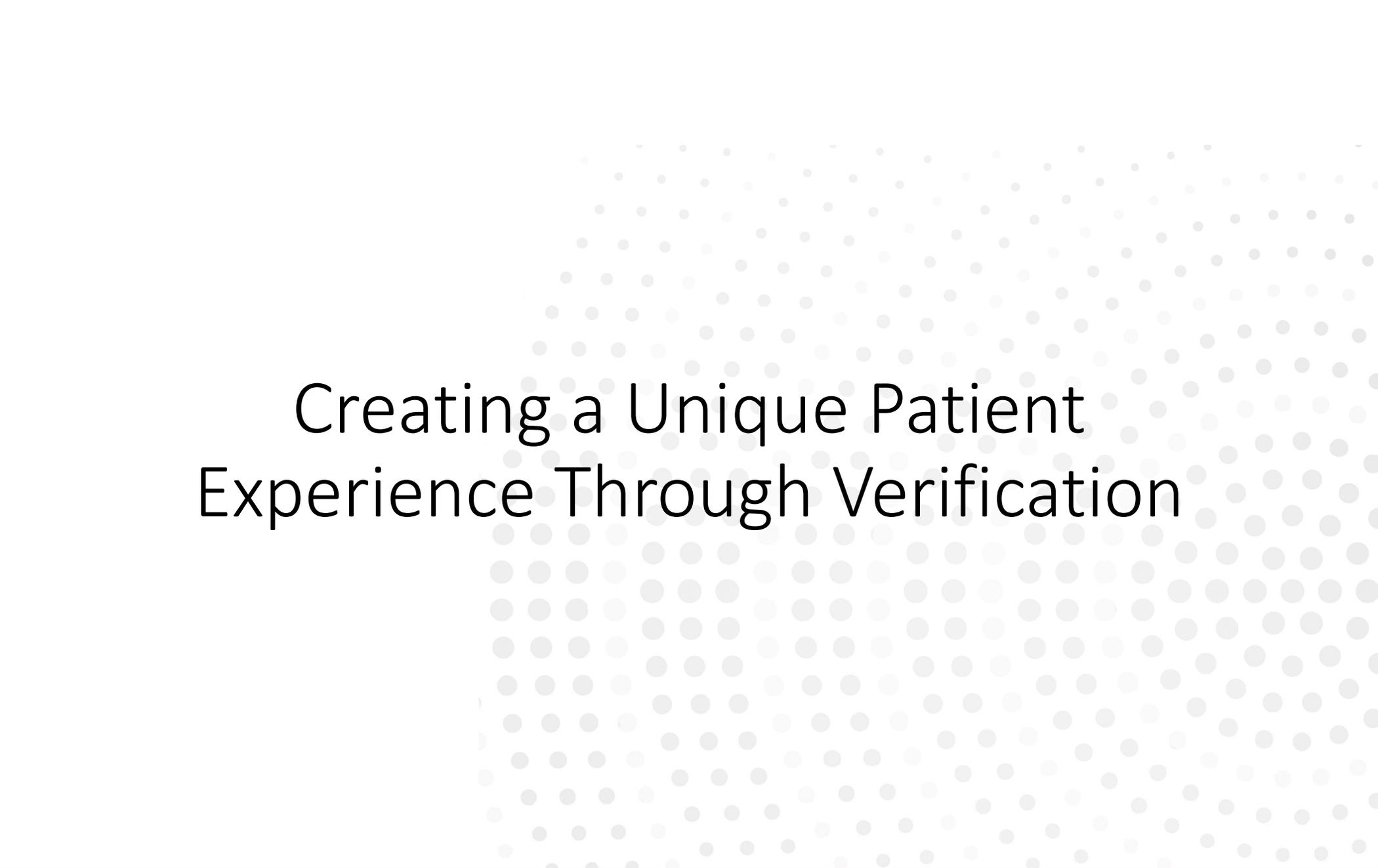
Positioning Professional Care Value Through Innovative Practice Strategies

Presenters

- *David J. Smriga, M.A.*
- *Gregory Frazer, Au.D., Ph.D.*
- *Adam DiPuccio, M.A.*
- *Dale Thorstad*

Agenda For Today's Presentation

- Creating a unique patient experience through verification
- Leveraging purchasing decisions to better meet pricing challenges
- Examining third-party pay options from an opportunity perspective
- Critical thinking regarding technology choices
- Building a clinical service for the PSAP (OTC) market



Creating a Unique Patient Experience Through Verification

Modern Verification Reference

- Speechmapping
 - Uses speech energy as the input stimulus
 - Measures output (REAR) rather than insertion gain (REIR/REIG)
 - Can be used to:
 - Verify target acquisition
 - Verify speech audibility improvement



Using Speechmapping as a Counseling Tool

- During the diagnostic visit
 - Once you have determined that this is a patient you intend to treat with amplification, move to the following counseling process

Access the Speechmap Screen

Verifit²
Advanced Verification

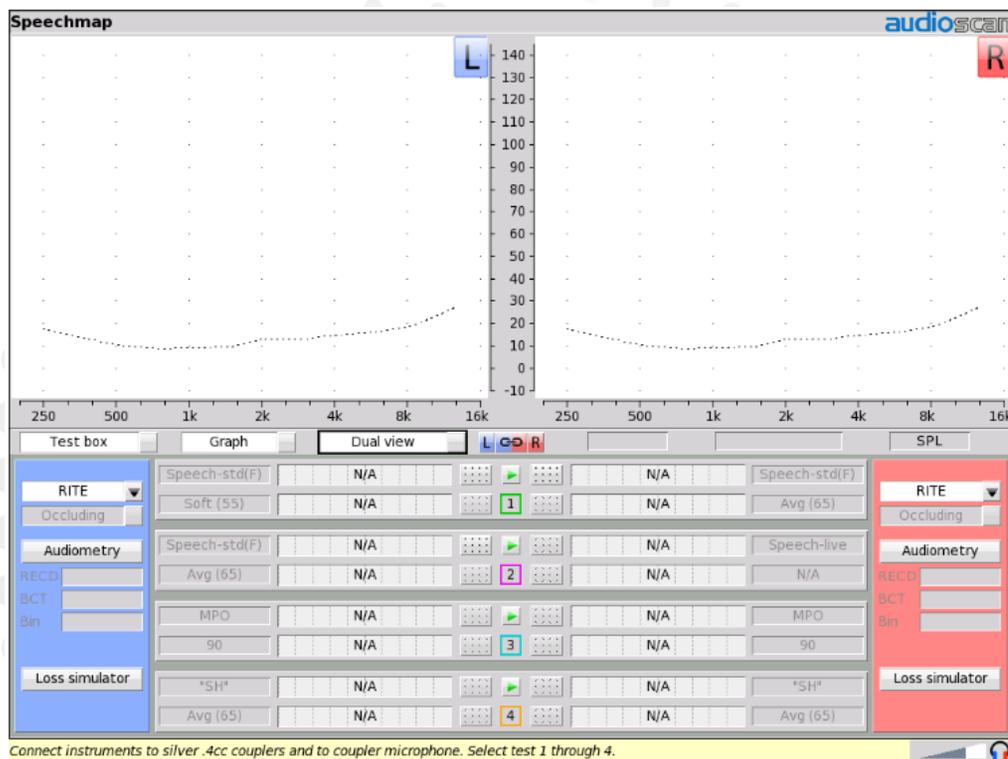
On-ear | **Test box**

- Speechmap
- Directional
- Noise reduction
- Manual control
- Calibration

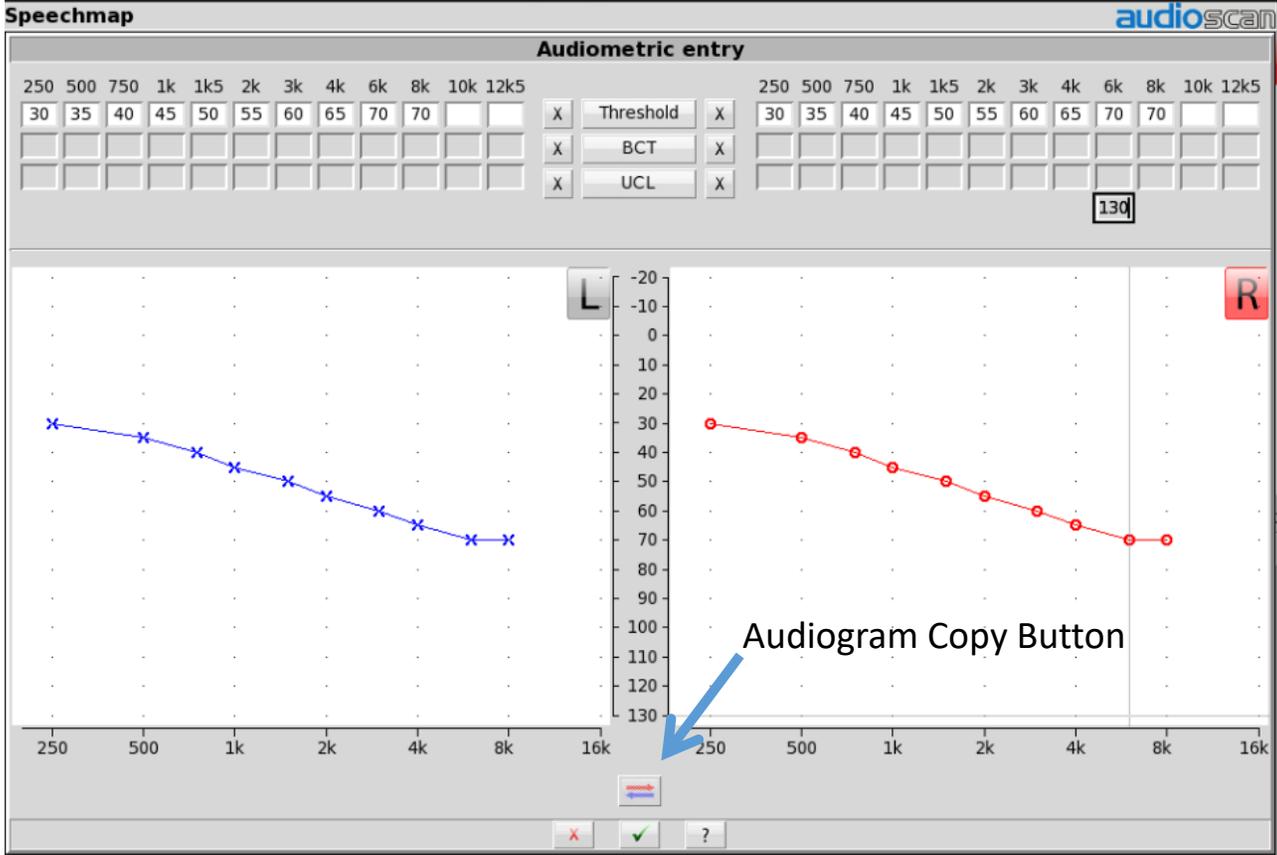
WRECD | ANSI / IEC
Occlusion | Distortion
Feedback | Input/Output
Insertion gain | Battery drain
Telecoil

L R | Print | Session | ? | Setup

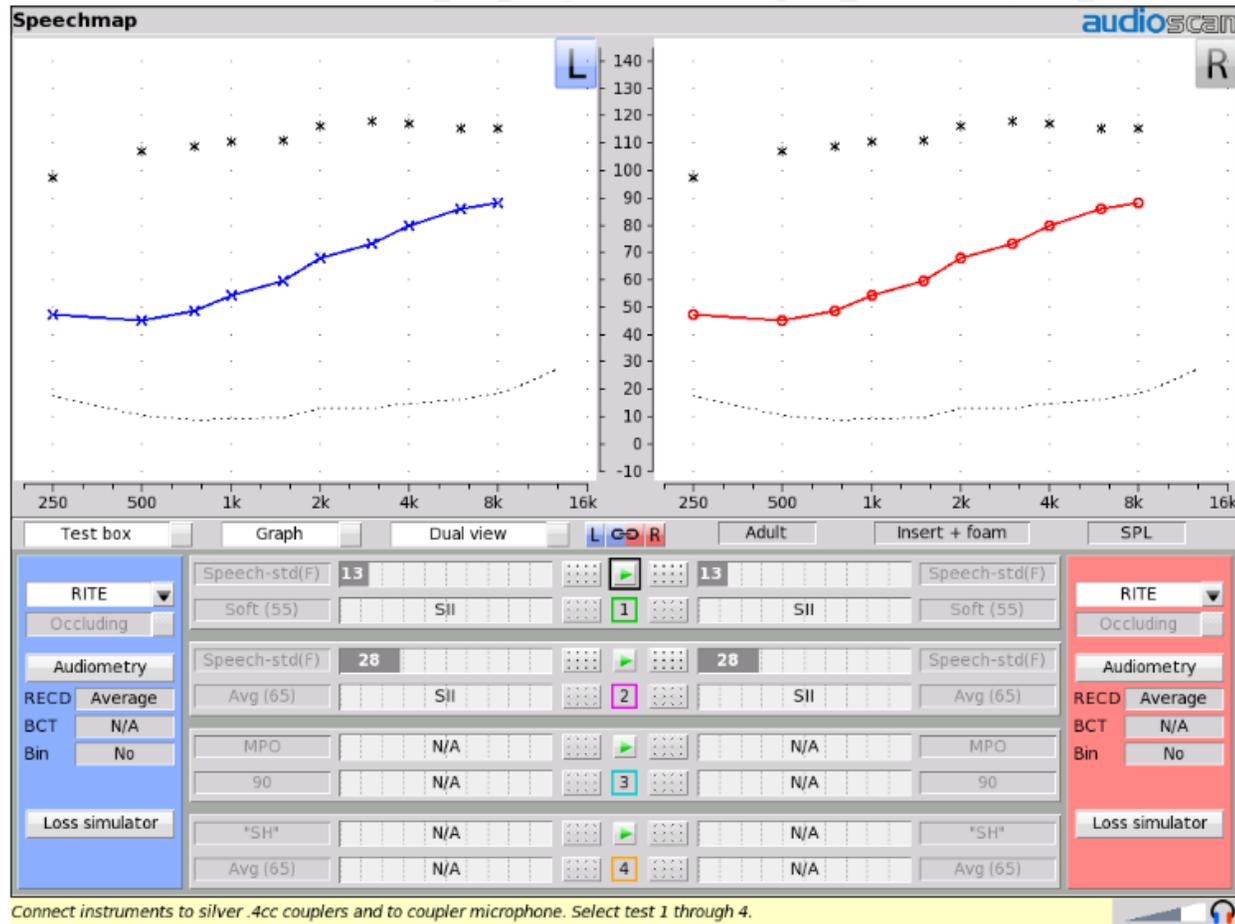
Version: 4.12.2
February 7, 2018
Network address: 192.168.1.101



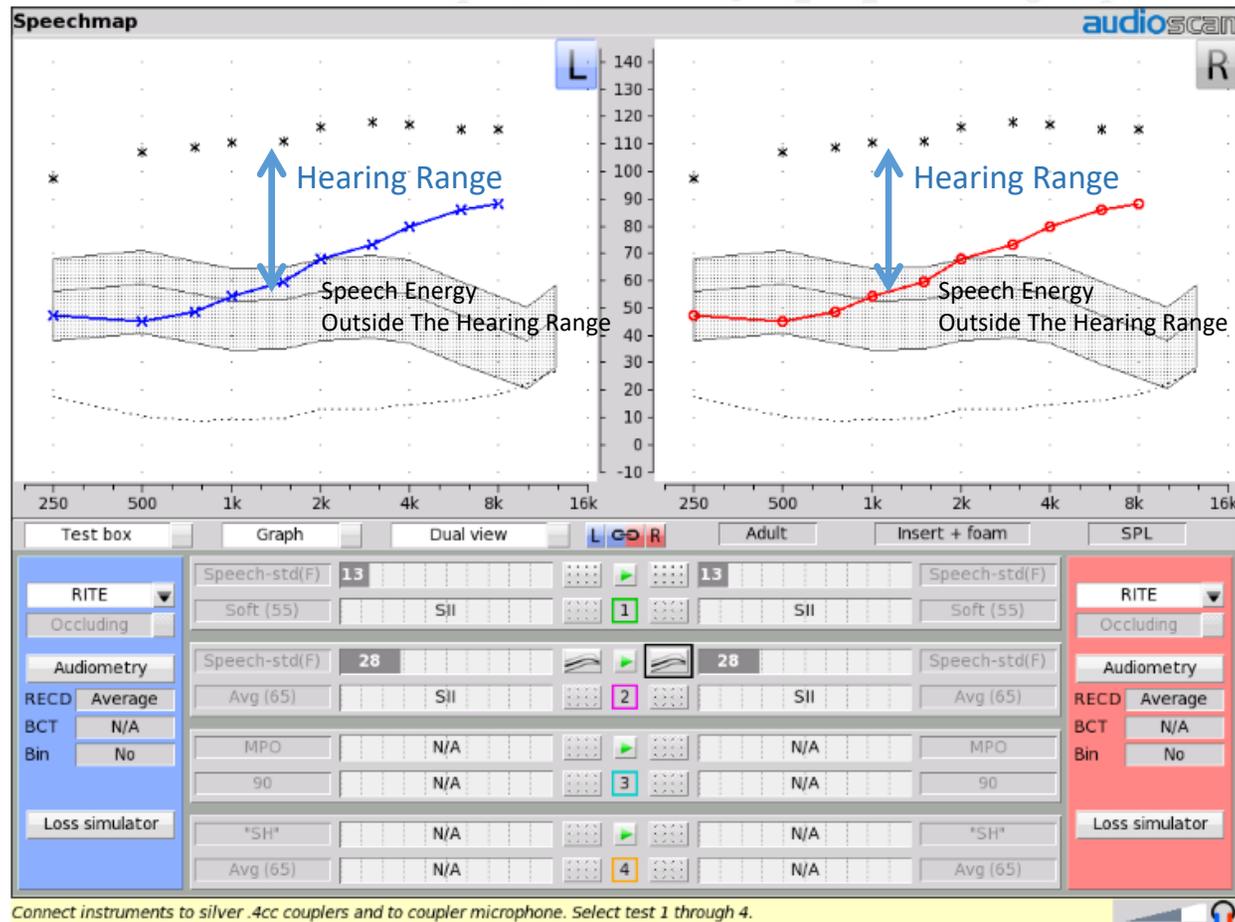
HL Audiogram Entry



The Basic Speechmap Screen – Verifit2



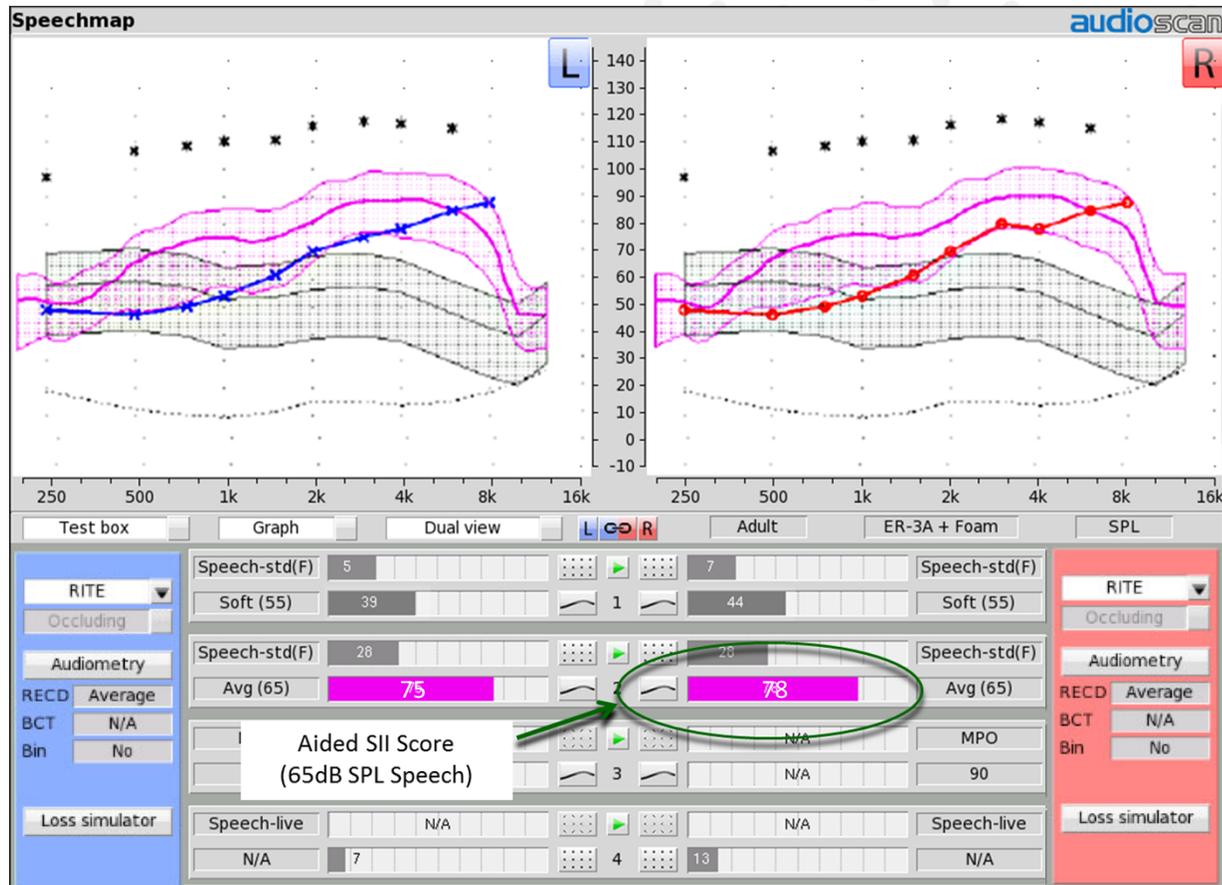
The Basic Speechmap Screen – Verifit 2



FIRST KEY VALUE PROPOSITION:

*We need to bring speech sounds back
into your listening range*

Aided and Unaided Speechmap

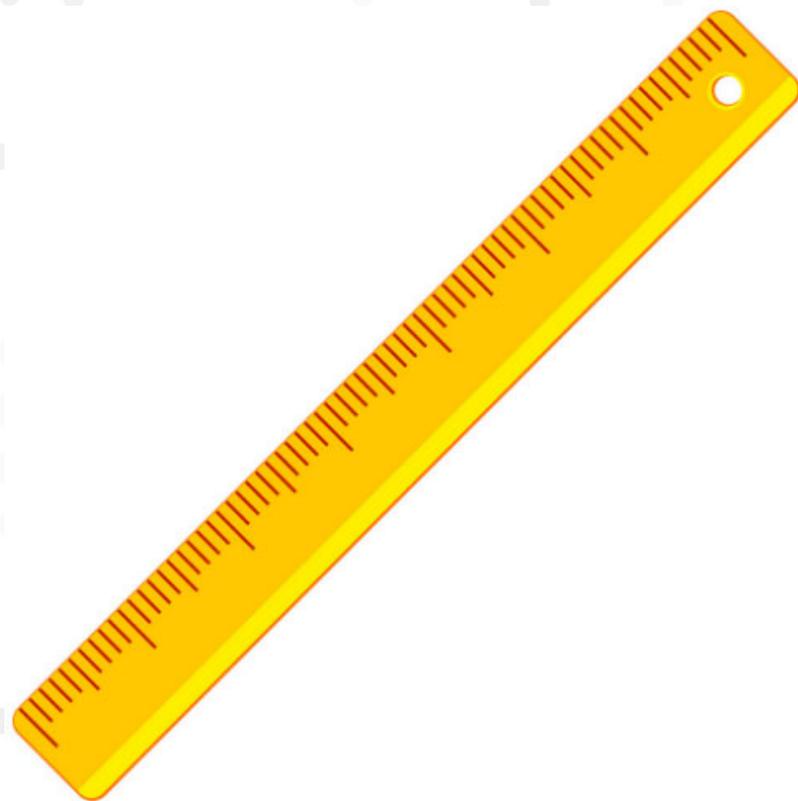


SECOND KEY VALUE PROPOSITION:

If we do our job well, we should get an aided SII approaching if not exceeding “X”

The Value of This Approach

- Defines two ways of judging hearing aid value that have **NOTHING** to do with sound quality
- Shifts the focus away from “product purchase” and towards “problem mitigation”
- **REQUIRES** (and demonstrates) the guidance and expertise of professional care





Leveraging Purchasing Decisions to Better Meet Pricing Challenges

So, how did we get to where we are today?

- **2017:** OTC Hearing Aid Act passed by U.S. Senate and soon after signed into law by President Trump.

THE HearingReview

LEGISLATION

US Senate Passes OTC Hearing Aid Act as Part of FDA Reauthorization Act of 2017

Published on August 4, 2017



Updated August 10, 2017

The US Senate passed [HR 2430](#), the Food and Drug Administration (FDA) Reauthorization Act of 2017, by a vote of [94-1](#) on August 3. The bill

Key Conclusions

- Two key factors drove the decision to create an OTC category for hearing aids:
 - Availability
 - Historically low market penetration
 - Suggesting current delivery system is not able to reach more people
 - Affordability
 - Hearing aids are expensive
 - Largely driven by high cost of professional care

Embracehearing.com

EFFECTIVE PRICE PER VISIT: EXAMPLE CALCULATION

Manufacturer Price	\$1,000
"Bundled" Price	\$5,000
Less: "Fair" Sale Price	\$2,000
Effective Price for Follow-on Services	\$3,000
Divided by: Actual Follow-on Visits	3
Effective Price per visit	\$1,000

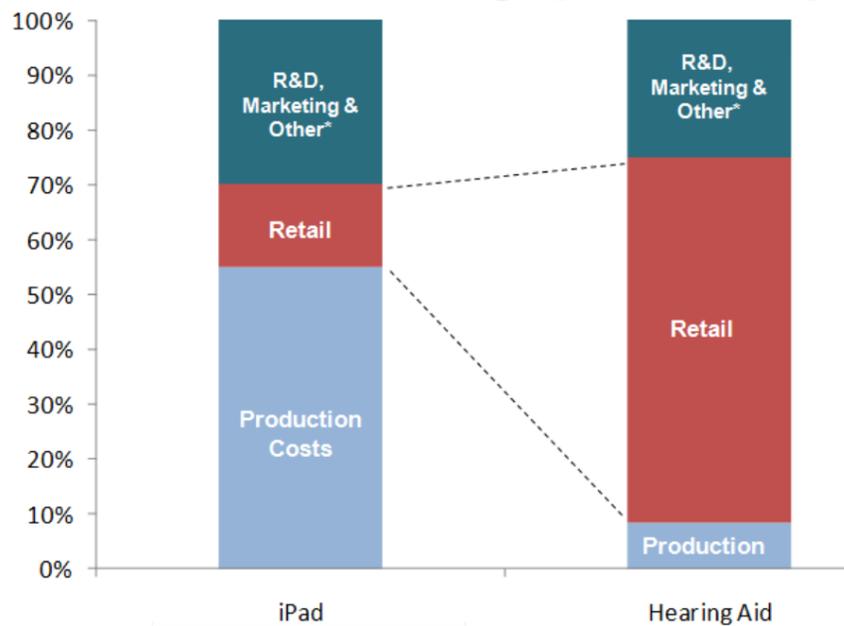
EFFECTIVE PRICE PER VISIT

Visits	"Fair" Sale Price				
	\$1,500	\$1,750	\$2,000	\$2,250	\$2,500
1	\$3,500	\$3,250	\$3,000	\$2,750	\$2,500
2	\$1,750	\$1,625	\$1,500	\$1,375	\$1,250
3	\$1,167	\$1,083	\$1,000	\$917	\$833
4	\$875	\$813	\$750	\$688	\$625
5	\$700	\$650	\$600	\$550	\$500
6	\$583	\$542	\$500	\$458	\$417
7	\$500	\$464	\$429	\$393	\$357
8	\$438	\$406	\$375	\$344	\$313
9	\$389	\$361	\$333	\$306	\$278
10	\$350	\$325	\$300	\$275	\$250

“At the risk of stating the obvious, we submit to you that these are very high numbers.”

In our view, it is unlikely that hearing aid wearers would be willing to pay per-visit prices at these levels, if given a transparent choice.”

Audicus.com



“The comparison is startling, and should raise questions on whether the industry and hearing aid costs are operating at its most favorable level for the consumer.”

The Reality Consumers DON'T See

	"Big Six" High-End Technology
Wholesale List Price	\$2099.00
30% Provider Discount	
"Big Box" Retail Price	
V.A. Acquisition Cost	

The Reality Consumers DON'T See

	"Big Six" High-End Technology
Wholesale List Price	\$2099.00
30% Provider Discount	\$1469.30
"Big Box" Retail Price	
V.A. Acquisition Cost	

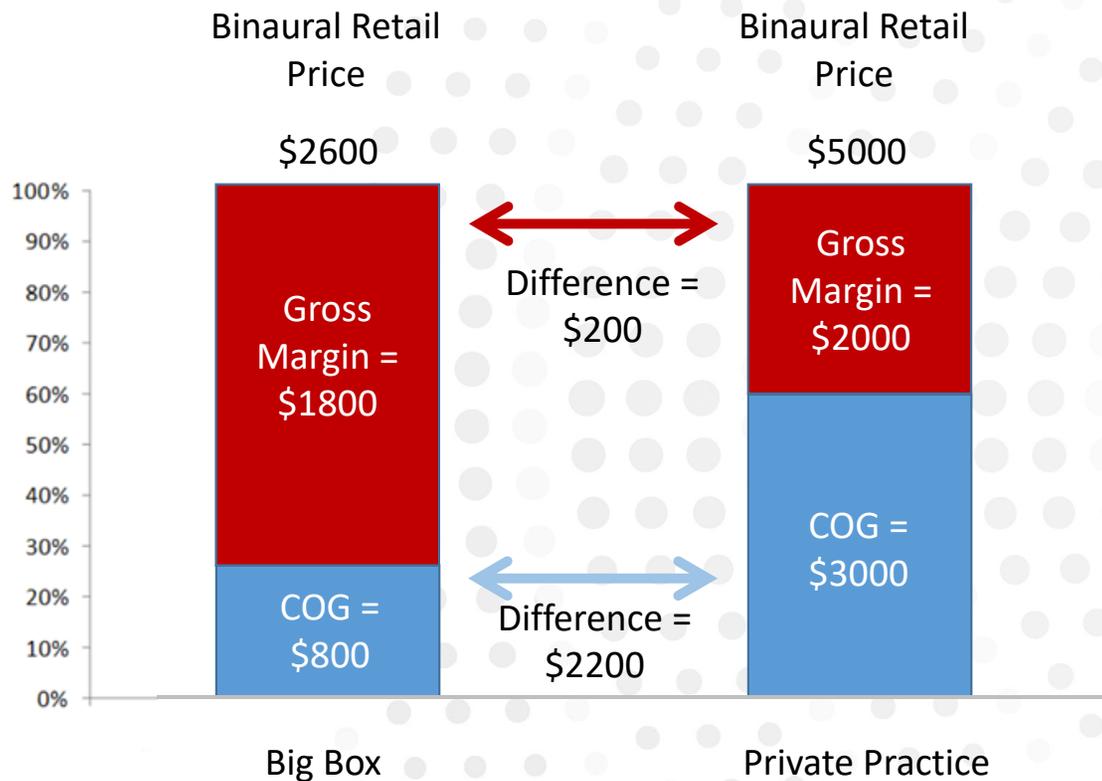
The Reality Consumers DON'T See

	"Big Six" High-End Technology
Wholesale List Price	\$2099.00
30% Provider Discount	\$1469.30
"Big Box" Retail Price	\$1299.00
V.A. Acquisition Cost	

The Reality Consumers DON'T See

	"Big Six" High-End Technology
Wholesale List Price	\$2099.00
30% Provider Discount	\$1469.30
"Big Box" Retail Price	\$1299.00
V.A. Acquisition Cost	\$375.00

This Comparison Raises a Completely Different Question



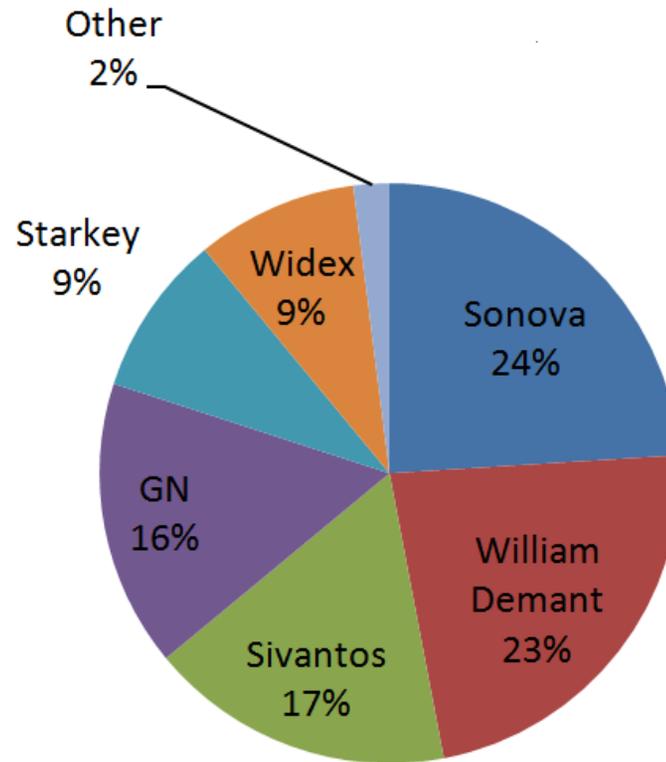
Proposition

If a practice's cost of goods can be better managed, affordability can be addressed without impacting operating margins

So, how can we lower cost of goods?

- Option 1:
 - Who you buy from

The “Big Six”



<http://hearinghealthmatters.org/hearingnewswatch/2013/research-firm-analyzes-market-share-retail-stores-prospects-of-major-hearing-aid-makers/>

COG Comparison: “High End” Technologies

	Brand 1	Brand 2	Brand 3	Brand 4
Big Six	\$1247	\$1300	\$1160	\$1300
Other	\$845	\$877	\$1000	\$450

20 channel
Adapt. Dir.
Wireless
FB Mgt.
Noise Mgt.
Wind Noise
Rechargeable

18 Channel
10KHz Bandwidth
Scene Detect
FB Mgt.
Active Noise Guard
Wind Shield
Adapt. Dir.
Tinnitus Module

Reduced COG Range: \$320 - \$1,700 a pair.
NO impact on practice margin.

So, how can we lower cost of goods?

- Option 2:
 - How you buy

Group Purchasing

- Concept:
 - Secure prices from key suppliers based on collective buying volume
- Execution:
 - Some groups offer services that are paid for by member purchases
 - This requires a margin on every hearing aid sale through the buying group
- Reality:
 - There are too many buying groups
 - Dilutes the influence of any one of them

Both options require a change in behavior

Changing behavior isn't easy

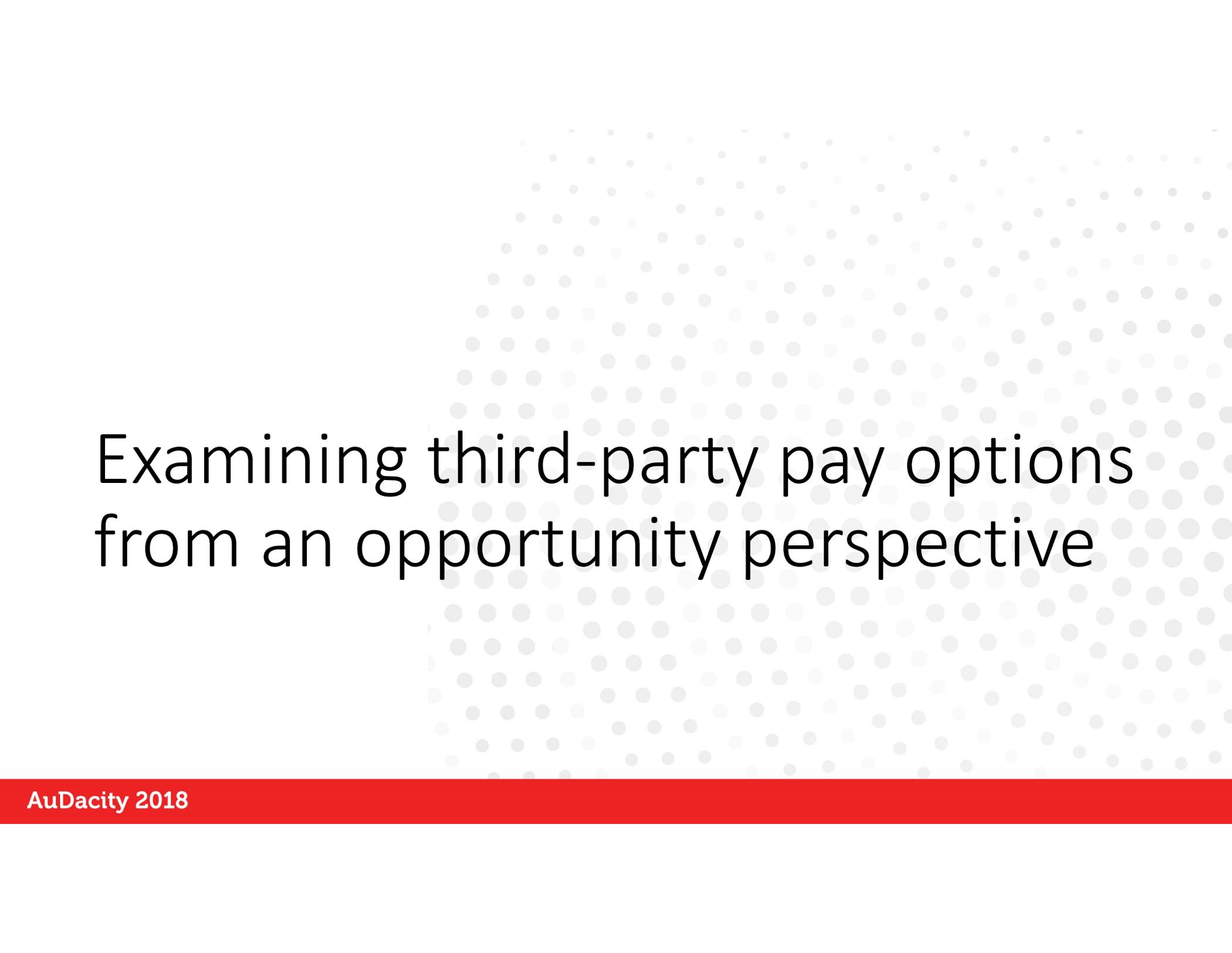
The psychology of change resistance:

1. We are swayed by marketing
2. Habit

Alain Sampson, Ph.D. – Founder of behavioraleconomics.com
and Chief Science Officer to Syntoniq



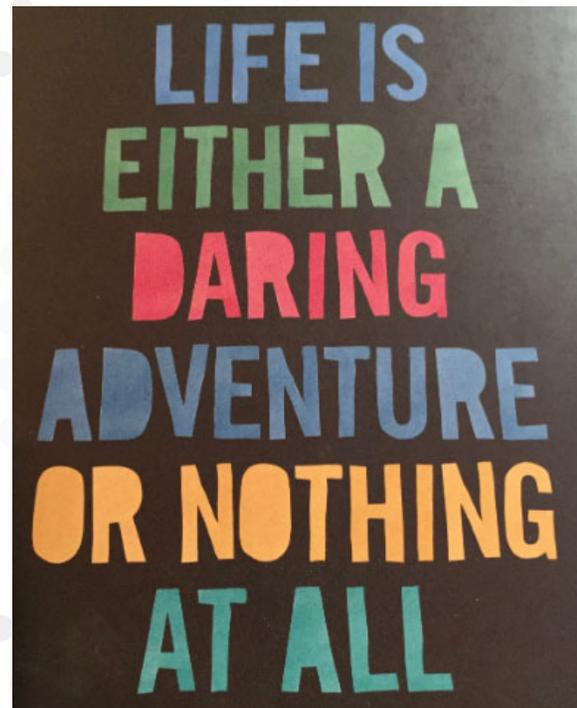
Alain Sampson Ph.D.



Examining third-party pay options from an opportunity perspective

The Opportunity of Thinking Anew

“If you do what everyone else does, you get what everyone else gets.”



Here's an idea . . .

Arrange for insurance companies to “push” patients through your doors!



Leveraging Insurance Relationships

- Educate the surrounding medical community with Lunch & Learns
- Conduct your own prior authorizations



Managing Growth

- Add new offices to expand coverage strategically
- Outsmart your competition by locking up networks



Practice Growth

- Disease State Marketing Program
 - Hearing Healthcare Marketing Company
 - Bob Tysoe
 - Marketing Consultant and Sales Trainer



Operational Resources

- Hear Billing Solutions
 - Audiology billing, credentialing and consulting services made easy
 - To tell you more. . .
 - Stacey Long



Coding and Reporting

- Standardize coding within the practice
- Automate report writing to save time and insure accuracy



Return On Investment: An Example

- 2017 office operation
 - Two full time audiologists working 40 hours per week each M-F
 - Over 2,000 referring practitioners: MD's, DO's, Nurse Practitioners, RN's
 - Receiving an average of 18-20 referrals per day
 - Generated \$1,495,000 in insurance collected revenue
 - This does not include cash revenue

How Best To Get Started

- Educate yourself
- Meet with insurance representatives
- Get employee buy-in
- Make a decision early on to handle billing internally or externally
- Make sure report writing can survive an audit
- Standardize coding within the practice
- Secure a good healthcare attorney

Critical thinking regarding technology choices

If they build a better mouse trap,
it would help if you know how to use it.

Feedback Management

- DFS Ultra II, Auto DFS
- Feedback management
- Feedback manager
- Feedback test
- Feedback Preventer
- Feedback Shield
- Feedback Cancellation
- Feedback Analyzer

Noise Management

- Noise Management
- Open Sound Navigator
- 3D Classifier
- Sound Conductor
- SurroundOptimizer
- Noise Tracker II



Automatic Programs

- SoundNav
- AutoSurround
- Environmental Optimizer II
- Environment Manager



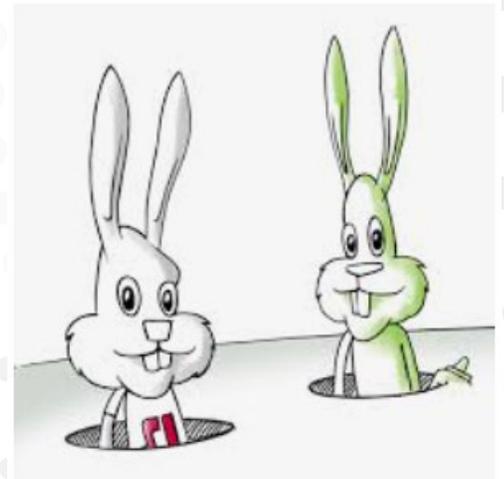
Spatial

- Spatial Awareness
 - Spatial SpeechFocus
 - Spatial Sound
- SphereSound
 - SpeechPro
 - Spatial Sense



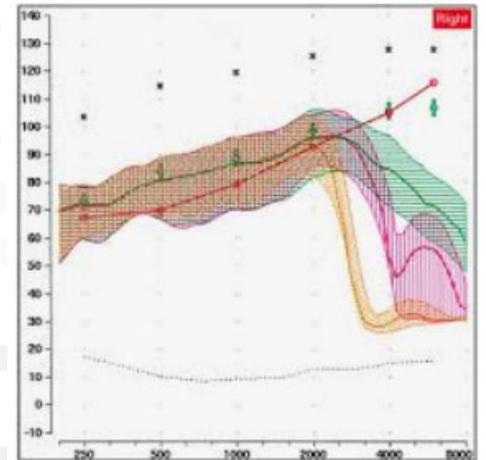
Directionality

- SpeechBeam
- Binaural Directionality III
- Directional Processing
- HD Locator



Frequency Lowering

- Speech Rescue
- Sound Shaper
- Frequency Lowering
- SoundRecover2



Loud Sounds

- Soft-Level Noise Reduction
- Anti Shock II
- Impulse Noise Reduction
- TruSound Softener



- Sound smoothing
- Automatic Classifier
- Voice Ranger

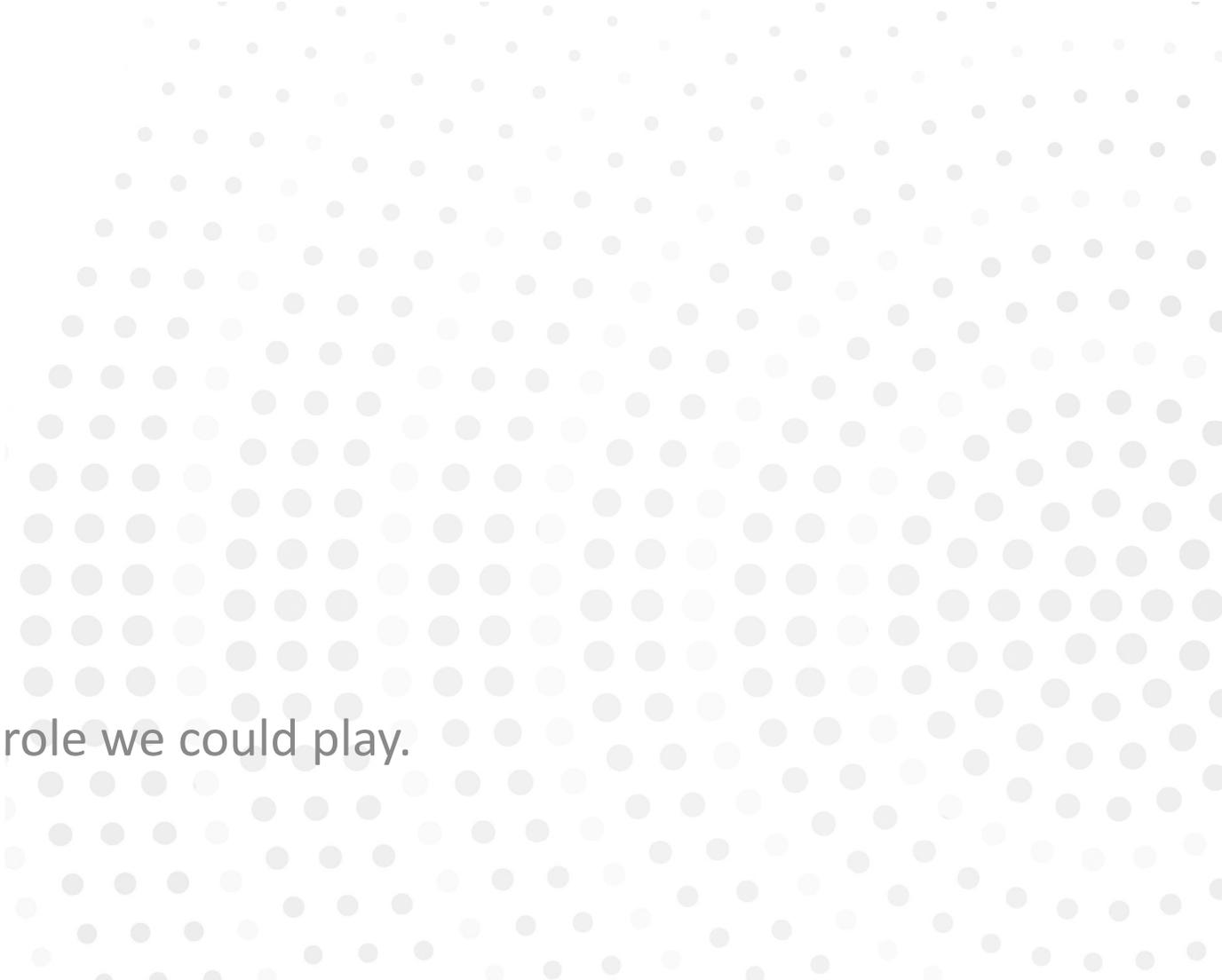
- Sound Radiance
- Reverb Reducer
- Digital Pinna



Building a Clinical Service for the PSAP (OTC) Market

One thing that seems apparent...

- The prevailing perception is that there is no role (or at least no role yet defined) for the hearing care professional in the OTC category.



So, let's talk about the role we could play.

We'll Start With ANSI/CTA - 2051

- Crafted by the Consumer Technology Association's R6 Portable Hand-Held and In-Vehicle Electronics Committee
- Scope:
 - The standard includes performance metrics and associated target values for consumer products that provide personal sound amplification or enhancement to a user.



ANSI/CTA – 2051 Sections

- Category 1:
 - The description of a hearing device performance parameter which must include the value measured per the specified test method. Category 1 requirements include a threshold or acceptable range for the parameter measured.
 - Parameters included in Category 1 are:
 - Frequency Response Bandwidth
 - Frequency Response Smoothness
 - Maximum Acoustic Output
 - Output Distortion
 - Input Distortion
 - Self-generated noise levels

Category 1 Purpose

- Consumer Safety:
 - Since these products are intended to be usable without any professional oversight, some limits on acceptable performance standards must be established.

The 3 Category 1 Parameters Killion's Presentations Zeroed in on:

- Frequency Response Bandwidth
- Frequency Response Smoothness
- Maximum Acoustic Output

Frequency Response Bandwidth

- Determine the upper and lower cut off frequencies at which the estimated insertion response falls 10dB below the average level of insertion gain in the 1/3 octave bands from 500 to 3150 Hz.
- Stimulus to be used:
 - 80dB pure tone sweep
 - NOTE: an alternative signal (i.e., pink noise) can be used if interactive functions compromise the sweep result.

Coupler to be used:

- A 2cc coupler should be used unless a bandwidth greater than 8KHz is to be verified. In this case, an ear simulator (711) coupler should be used.

CORFIG Tables Provided in ANSI/CTA – 2051 Standard

- 2cc coupler CORFIG's for ITE devices
- 2cc coupler CORFIG's for BTE devices
- Ear Simulator CORFIG's for ITE devices
- Ear Simulator CORFIG's for BTE devices

Bandwidth PASS/FAIL Criteria

- Bandwidth < than 5KHz = FAIL
- Bandwidth > 5KHz but < 10KHz = PASS- Standard Band
- Bandwidth at or above 10KHz = PASS- Wide Band

Frequency Response Smoothness

- No peak in the 1/3 octave frequency response shall exceed 12dB relative to the average levels of the 1/3 octave bands two third octaves above and below the peak.

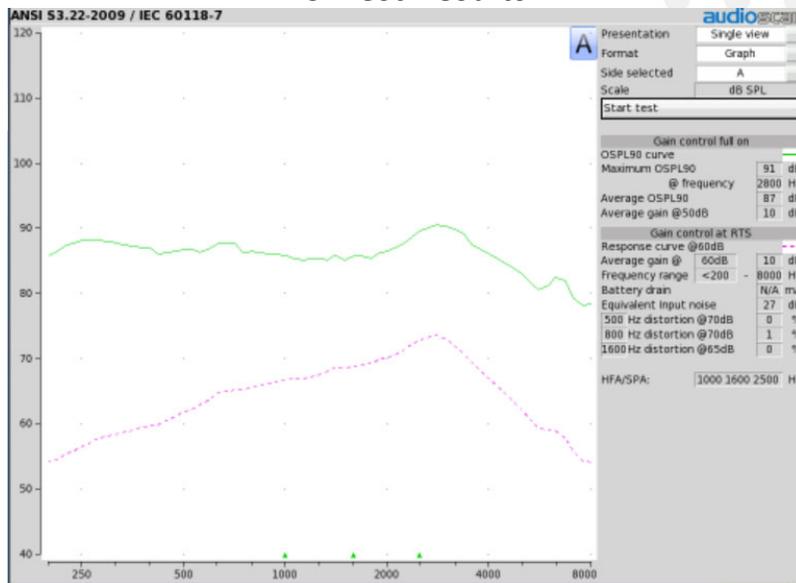
Maximum Peak Output

- Peak OSPL90 must be less than 120dB

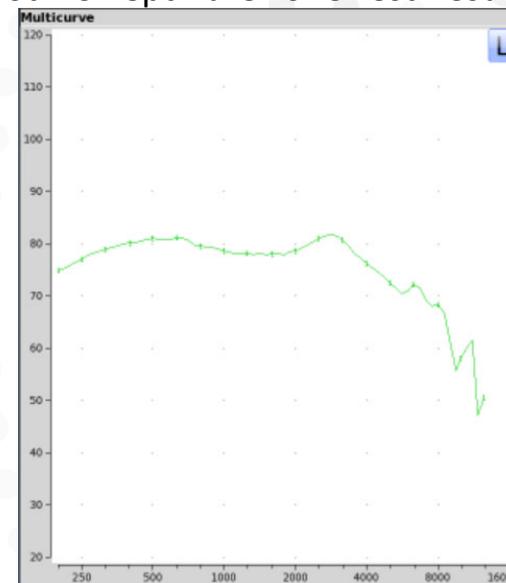
Example of Raw Data Collection: Electro-acoustic Measures

Product: Etymotic Research “Bean” at “Normal” Setting

ANSI Test Results



80dB Swept Pure Tone Test Results



CTA Level One Findings:

Output = 91dB PASS
Bandwidth = 100 – 8200Hz PASS
Peak = 8dB PASS

We'll Follow-up With Associations' Consensus Paper

- Compiled by the four professional associations of the hearing industry.
- Scope:
 - Offers 5 recommendations to the FDA that would assist them in insuring consumer safety when using OTC products.



The Consensus Paper Recommendations:

- Limit HFA FOG to 25dB in a 2cc coupler
 - This translates into 12-16dB gain for 65dB speech depending on mild or moderate degree of loss
- Use input compression and provide a volume control
- Limit Peak OSPL90 to 110dB max, 105dB max for mild losses
- Limit to the use of instant fit ear tips, not earmolds
- If a T-coil is incorporated, it should adhere to the current T-coil standards.

Clinical Verification of Consumer Electronics Hearing Products

David J. Smriga, M.A.



AuDacity 20

INDIANAPOLIS, IN

CONVENTION: APRIL 5-8, 2017 | EXPOSITION: APRIL 5-7, 2017

#AUDIOLOGYNOW17

AMERICAN ACADEMY OF AUDIOLOGY

Smriga Study Worksheet

CTA-2051 PASS/FAIL AUTO-CALCULATION SPREADSHEET - AUDIOSCAN TEMPLATE																	
For ITE Measurements Using 2cc Coupler																	
STEP ONE: In Row 12, enter 1/3 octave band values (Red Numbers) obtained after completing 80dB pure tone sweep test in "Multi-Curve" and changing "Format" to "Table" view																	
STEP TWO: Find the first negative high frequency value greater than -2dB in Row 23. Note the 1/3 octave frequency associated with that value																	
STEP THREE: Identify the frequency value just to the left of the above frequency value noted. Type this frequency number into Cell J 24																	
STEP FOUR: Enter values requested in cells D33 and D34																	
STEP FIVE: Enter Peak OSPL90 value from 2cc coupler measurement in Cell D38																	
OTC Product:																	
ENTER 2CC VALUES FROM 80dB SWEEP:																	
1/3 Octave Frequency	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000
2cc values (80dB Sweep)	75	77	79	80	81	80	80	79	78	78	79	81	81	78	77	73	68
Estimated IR Values - ITE	71.7	73.6	75.5	76.5	77.7	76.9	77.2	76.1	75.6	76.9	80.3	84.4	81.9	73.9	69.1	62	53.5
10dB Down Calculation to determine Row 22 value																	
1/3 Octave Frequency	500	630	800	1000	1250	1600	2000	2500	3150	Avg.	Avg. -10dB						
Estimated IR Values - ITE	77.7	76.9	77.2	76.1	75.6	76.9	80.3	84.4	81.9	78.56	68.56						
FREQUENCY RANGE CALCULATION																	
1/3 Octave Frequency	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000
Estimated IR Values - ITE	71.7	73.6	75.5	76.5	77.7	76.9	77.2	76.1	75.6	76.9	80.3	84.4	81.9	73.9	69.1	62	53.5
- 10dB Down Value	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56	68.56
Range Values (+ = in range)	3.14	5.04	6.94	7.94	9.14	8.34	8.64	7.54	7.04	8.34	11.74	15.84	13.34	5.34	0.54	-6.56	-15.06
										Hi Frequency Value =	5000	Hz	PASS if high frequency value >= 5000Hz				

RED numbers = Numbers you enter
 BLUE numbers = Numbers automatically calculated
 BOLD numbers = Answers that determine Pass/Fail

1) CTA Test Summary

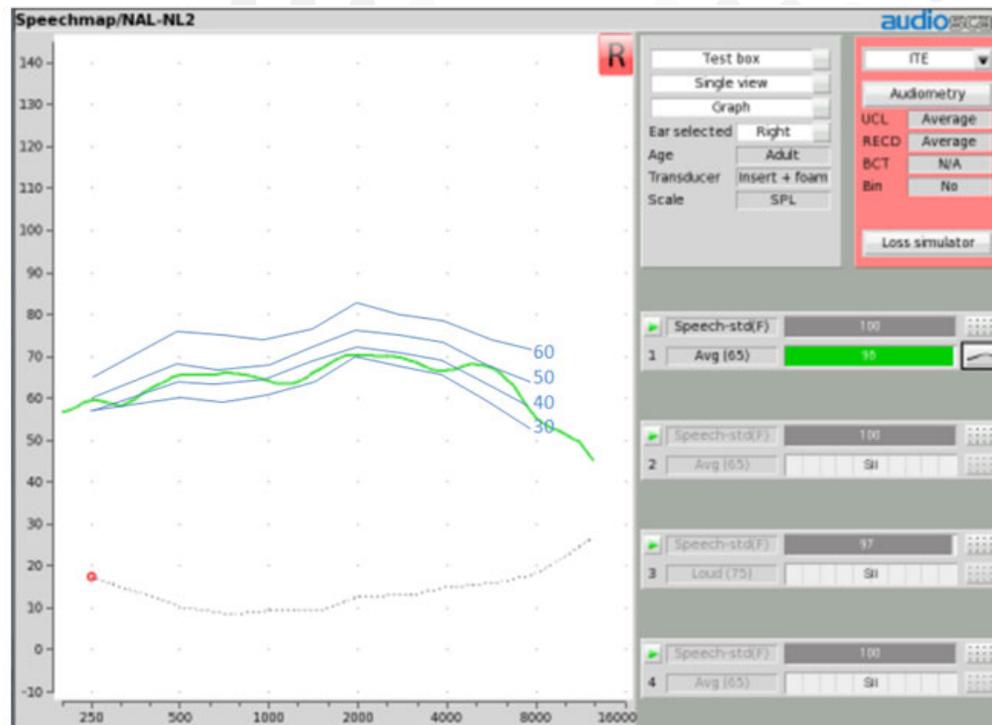
Results

9 PSAP Products Tested

25 Product Configurations Tested (24 testable in box)

TEST RESULT	# OF CONFIGURATIONS	REASON FOR FAILURE
Pass all 3 tests	11	
Fail 1 test	8	2 bandwidth fails 6 peak ampl. fails
Fail 2 tests	3	1 output fail 3 bandwidth fails 2 peak fails
Fail all 3 tests	2	

Fitting Range Template Overlaid On Test Box Speechmap REAR

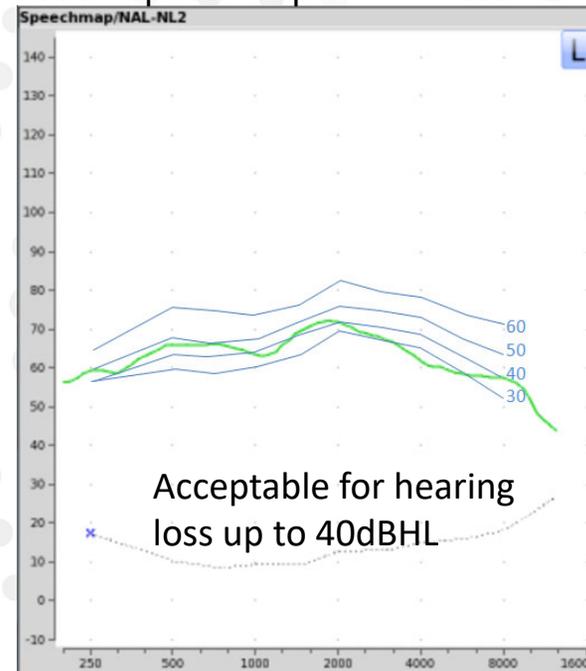


Proposed “Basic” PSAP Test Battery

Product Quality Test Results

TEST	RESULT
Bandwidth	PASS
Peak	PASS
Maximum Output	PASS

65dB Speechmap REAR – Test Box



Proposed PSAP Clinical Report Summary

Personal Sound Amplification Product
Quality Assessment and Hearing Loss Fitting Range

Patient Name: _____

Product Being Tested: _____

Date of Test: _____

Person Conducting Test: _____

Test Results:

Quality Standards Test

Test	Result
Output	
Response Range	
Peak Size	

Pass/FAIL Criteria:
 Output must not exceed 120dB SPL
 Response Range must be greater than 5000Hz
 Peak size shall not exceed 10dB

Fitting Range Test

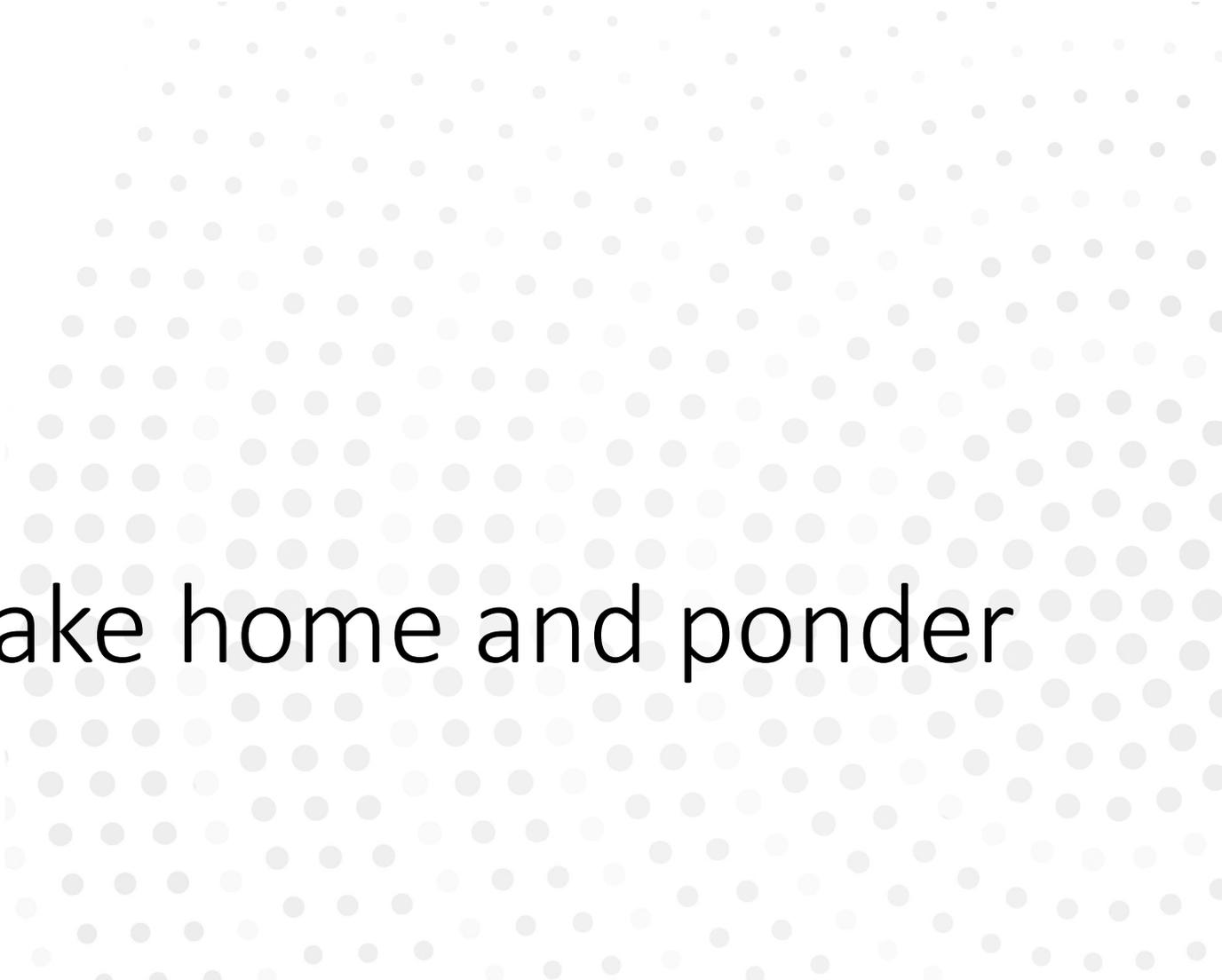
PURE TONE AUDIOGRAM

Potential Applications

- A service audiologists can offer to existing PSAP owners
- A service audiologists can offer to consumers interested in a certain PSAP
- A clinical procedure for quantifying PSAP products an audiologist may wish to stock/sell

Conclusions

- A professional can offer a potentially useful service to the PSAP and future OTC market
- The described test package can be completed quickly and easily
- This service can be offered for a modest fee
- This interface can lead to additional testing and possible better treatment with other devices



Things to take home and ponder

What To Consider:

- We must shift consumer focus from a “product transaction” view to a “health care” view
 - Speechmapping helps shift the value-focus from “sound quality” to “problem mitigation”
 - Tangible outcome verification experiences
 - Integration of rehabilitative care into the treatment package
 - Outcome measures to validate effectiveness of treatment

What To Consider

- There are ways to significantly lower COG without impacting operating income
 - Expanding your view of who to buy from
 - Commit to purchasing together to secure better pricing

What To Consider

- Partnering with insurance companies
 - Can be use as a low-cost marketing technique
 - Get insurance companies (and referrers) to push people through your door
 - Requires a lot of front-end work, but has a huge back end pay-off potential
 - There are outside resources that can help

What To Consider

- Selectively understanding and applying key hearing aid technologies can showcase the value of professional care from a product perspective.

What To Consider

- If you have a test box, you can perform a valuable service NOW for the existing PSAP market, and later for the OTC market