

## In a Changed World, Optimizing Patient Outcomes Requires a Blended Care Approach

Brian Taylor, AuD



# A Blended Care Approach to Optimizing Patient Outcomes: Putting Telehealth and Al-based Tools to Work in Your Practice

6-part series



Part 1: In a Changed World, Optimizing Patient Outcomes Requires a Blended Care Approach

Part 2: The First 60 Days: Optimizing Initial Patient Outcomes with Al-Based Tools and In-person Care

Part 3: Beyond the First 60 Days: Blending Al-Based & Remote Services with Inperson Care to Improve Long-term Patient Outcomes

Part 4: Optimizing Communication in Background Noise: Fundamental Principles

Part 5: Optimizing Communication in Background Noise: Assessment and Hearing Aid Evaluation Considerations in a Blended Care Model

Part 6: Optimizing Communication in Background Noise: Signia's Legacy of Innovative Features

### **Disclosures**



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Director, Clinical Content Development, Signia

Editor, Audiology Practices (ADA)

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### **Agenda**



- 1. What is Blended Care?
- 2. Three prerequisites for successful implementation of blended care
- 3. Why and how a blended care model fits into optimizing patient outcomes

### **Learner Outcomes**



- Explain the concept of clinical best practices, relationship-centered communication and how they apply to a blended approach to hearing care.
- Describe various Signia telehealth tools and how they are applied in a blended care model.
- Explain how to implement patient centered, blended care approach using Signia telehealth tools.

### This presentation is dedicated to

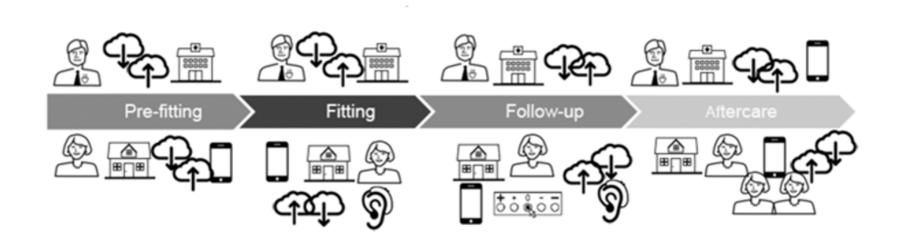




- Older adults who are vulnerable to COVID-19
- Afraid to venture out of their house
- Often dependent on others to go places
- Struggle with hearing loss and susceptible to reduction in quality of life
- Challenged by new technology

### **Blended Care:**

High-Touch Service in a Low-Touch Economy





### What is Blended Care?



Acknowledgement to Elaine Saunders & Peter Blamey

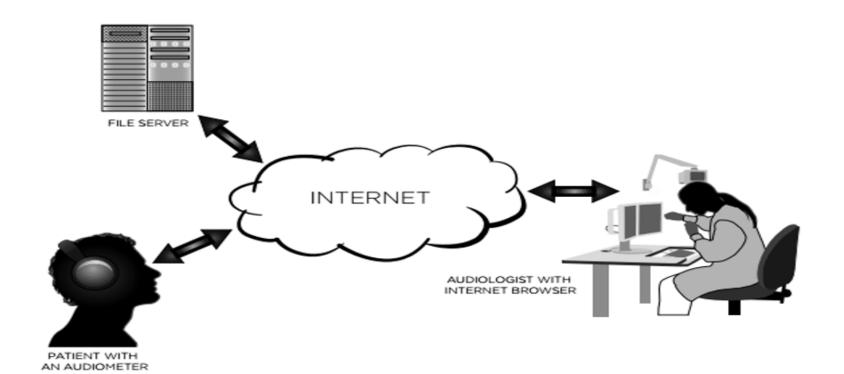


### "Every business is a software business"

Satya Nadella, CEO of Microsoft







Givens, et al 2014



- The utilization of telemedicine to provide audiological services and may include the full scope of audiological practice
- First available in early 2000s



### 2 primary types:

- Satellite office with non-audiologist staff involvement
- Home-based using standard computer/smartphone and Wi-Fi connection



### Comparison of Two Models of Tele-Audiology and the Requirements for Implementation



SPACE REQUIREMENTS	Satellite clinic.	Virtual clinic.
EQUIPMENT	The types of test equipment depend on the mission of the satellite clinic.  Basic components include: Internet connection, video otoscope audiometer, middle ear measurement device, equipment for real-ear measures, 3D-ear scanner for taking impression of the ear, other equipment as needed.	Mobile smartphone, tablet, computer, internet connection, calibrated headphones.
IDENTIFICATION/DIAGNOSIS	A fully functional satellite clinic is capable of performing all tests.	Currently technology permits hearing screening, hearing threshold assessment, and speech audiometry.
TRAINING STAFF AT MAIN CLINIC AND SATELLITE CLINIC	Critical to train the staff at both locations.	No facilitators are needed for this model, but a thorough understanding of technology is required.
VIDEO VISITS BETWEEN AUDIOLOGISTS AND PATIENTS	Video visits can be achieved by using communication platform that is HIPAA-compliant; currently, HIPAA compliance has been relaxed.	Video visits can be achieved by using communication platform that is HIPAA-compliant; currently, HIPAA compliance has been relaxed.
PAYMENT	Several private payers pay for such services, not for Medicare patients.	This is a new service, and the reimbursement should be negotiated or private pay options explored.

Audiology Today, Jul/Aug 2020



### 3 primary applications:

- Remote hearing assessment
- Remote hearing aid fitting & adjustment
- Remote counseling & rehabilitation

### Remote Hearing Tests and Risk Assessment



- 1. Remote Pure Tone Assessment:
- Screening (e.g., Shoebox Audiometry)
- Suprathreshold (digits-in-noise test and Blamey Saunders Speech Perception Test (SPT) )
- **Insitu** (through hearing aid)

#### 2. Remote Risk Assessment:

- Consumer Ear Disease Risk Assessment (CEDRA)
  - 15 questions that assess probability of ear disease
  - Sensitivity: 76% to 91%
  - Specificity: 72% to 80%

### Remote Hearing Aid Fitting & Adjustment

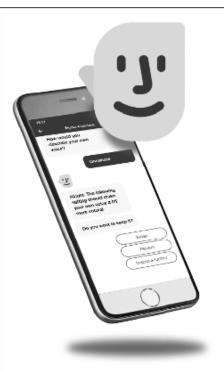


FEATURE	DESCRIPTION
FINE TUNING	Full and limited fine-tuning via real-time and asynchronous remote programming
FITTING	Feedback measurements In-situ audiometry
SATISFACTION SURVEYS	Ability to rate listening situations and programming adjustments
TRACKING	Ability to see battery charge and datalogging
REMOTE FIRMWARE AND SOFTWARE UPGRADES	Ability to update device firmware remotely
HARDWARE DIAGNOSTICS	Ability to identify microphone, speaker, and internal noise issues
CONSUMER REMOTE CONTROL	Tone control  Volume control  Compression control  Directional control
	Noise reduction

Audiology Today, Jul/Aug 2020

### **\$19010**Life sounds brilliant.











### Real-time vs. Asynchronous



- Real-time or synchronous: Provider and client are interacting together, at the same time (Skype calls, webchats, video conferencing)
- 2. Asynchronous: When there is a time difference in the interactions between the provider and client. Provider makes adjustment to hearing aid while it's not being worn, sending client forms to complete for review at a later time

### "Necessity in the mother of invention" - Plato





### **Monumental Change**



"On Friday, March 20, 2020, the entire group of audiologists I work with at the University of Pittsburgh Medical Center (UPMC) was taking care of patients in person. Three days later, Monday, March 23, 2020, we were providing all of our services remotely."

- Catherine Palmer, PhD, President, AAA



### High-Tech, High-Touch



#### **LOW-TOUCH PATIENT** Contact audiologist Digital proficiency screen PATIENT Guided self-testing **PATIENT** Teleconsultation with audiologist **AUDIOLOGIST** Teleconsultation Counter-side or **AUDIOLOGIST** drive-through Standby support, review results & next steps **AUDIOLOGIST** Discuss & recommend treatment Counter-side or drive-through **PATIENT** PATIENT Receive hearing aid Follow-up teleconsultation **AUDIOLOGIST** Select & program **AUDIOLOGIST** hearing aid (if indicated) Troubleshoot

Remote fine-tuning

Counselling

**AUDIOLOGIST** 

Fit-and-go consult

Swanepoel & Hall, 2020

#### **NO-TOUCH** PATIENT Contact audiologist Digital proficiency screen PATIENT Self-test setup and testing Ship self-test kit to home Collect, return & **AUDIOLOGIST** disinfect kit Teleconsultation **AUDIOLOGIST** PATIENT Telesupport Follow-up Review results telesupport PATIENT PATIENT Teleconsultation with audiologist Guided hearing aid fitting Ship hearing aids **AUDIOLOGIST** to home Troubleshoot Remote fine-tuning Counselling **AUDIOLOGIST AUDIOLOGIST AUDIOLOGIST** Select, program & send Feedback,, counsel & Telesupport & troubleshoot hearing aid (if indicated) Swanepoel & Hall, 2020 recommend treatment

### **Advantages of Tele-audiology**



- Convenient for patient
- Improve efficiency of practice
- Enhances in-person care by providing additional touch-points
  - Preparation & Goal setting
  - Hearing aid adjustments
  - Counseling sessions
  - Troubleshooting

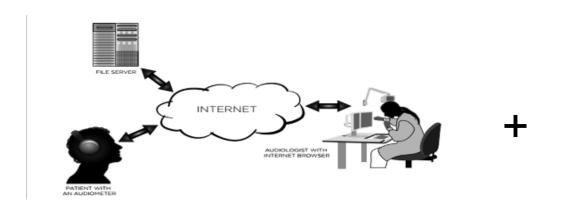
### **Limitations of Tele-audiology**



- Limited diagnostic information
- Cannot complete verification procedures (e.g., REM)
- Difficult to get communication partner involved in the appointment process
- Technical difficulties and user error can occur
- Challenging to build trust and rapport remotely

### **Blended Care – Best of Both Worlds**







- 1. Combines in-person and remote tele-audiology
- 2. Patient and provider decide when to use each
- 3. Enhances relationship-centered communication

### **Blended Care in Theory**



- 1. Hearing Assessment (In-person or tele-audiology)
- 2. Review preparatory material (tele-audiology)
- 3. HAE (in-person)
- 4. HA Fitting (in-person)
- 5. 1-week Check (tele-audiology)
- 6. 3-week Check (in-person)
- 7. Finetuning as needed (tele-audiology)

### How do we use blended care to optimize outcomes?





### **Hearing Aids Improve the Quality of Life**



- 1. Communication
- 2. Health-related Outcomes



### Consistent hearing aid use results in.....





Improved communication – by eliminating or minimizing activity limitations and participation restrictions



Improved health-related outcomes

### **Health Related Outcomes**



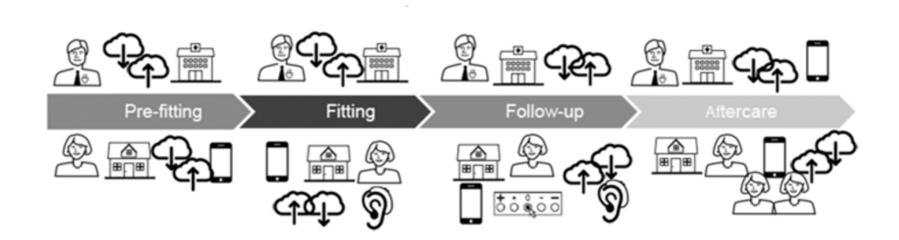
#### Consistent hearing aid use....

- Mitigates trajectory of cognitive decline
- Reduces depressive symptoms
- Decreases social isolation
- Reduces risk of falling
- Lowers overall costs of care

Example: Maharani, et al (2018) Longitudinal Relationships Between Hearing Aid Use and Cognitive Function in Older Americans. JAGS 66,6, 1130-1136

### **Blended Care:**

High-Touch Service in a Low-Touch Economy



### **Prerequisites to Using Blended Care**



- Practice relationship centered communication
- Ability to follow a clinical protocol
- Have a tele-audiology infrastructure in place

### **Prerequisites to Using Blended Care**



- Practice relationship centered communication
- Ability to follow a clinical protocol
- Have a tele-audiology infrastructure in place
  - Stable
  - Easy to use from home by patients
  - Ensures privacy

### **Prerequisites to Using Blended Care**



- Practice relationship centered communication
- Ability to follow a clinical protocol
- Have a tele-audiology infrastructure in place



# What is Relationship-centered Communication (RCC)?



#### **Person with Hearing Loss**

+ Communication Partner



Engaged and informed

#### **Licensed Provider**



Attuned to emotional needs of PHL



#### **Person with Hearing Loss**

#### + Communication Partner

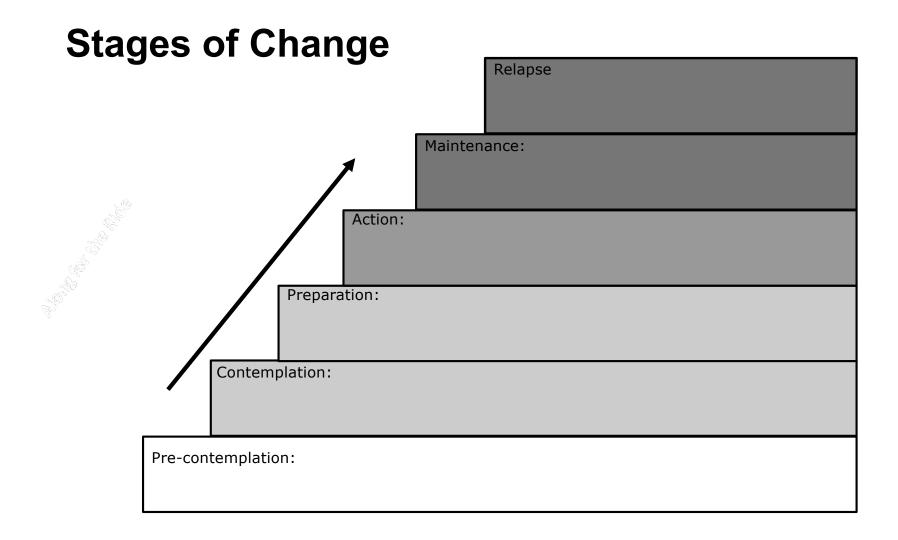
#### **Licensed Provider**



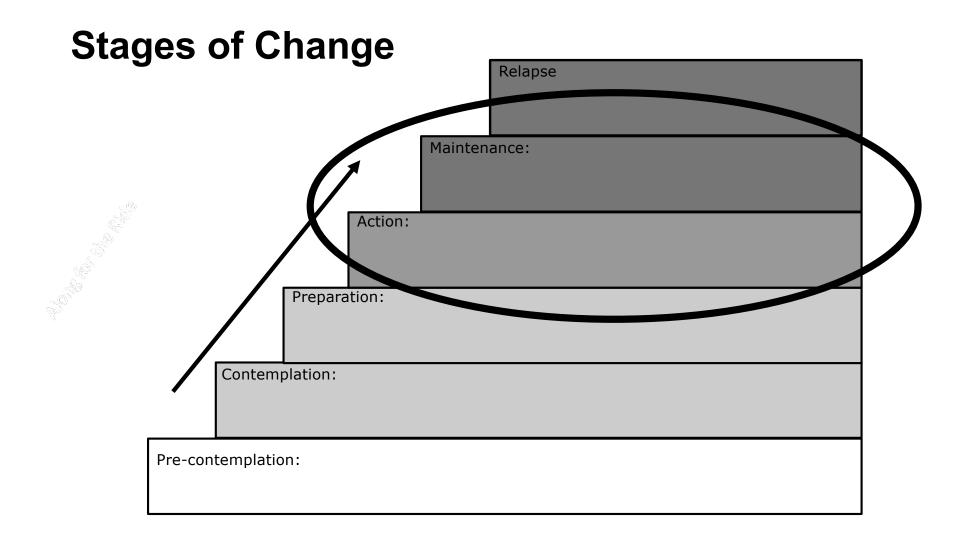
## Information exchange:

- Collaborative in nature
- · Personalized to behaviors, habits and values of PHL
- Based on shared decision making





Stages of Changes of the Transtheoretical Model



Stages of Changes of the Transtheoretical Model



# Why is RCC Important?







"The largest predictor of hearing aid benefit is the *quality of interaction with the professional*, rather than the degree of hearing loss."

- Harvey Dillon, PhD

# Why is RCC Important?



Improves probability of successful outcomes



# **Prerequisites to Using Blended Care**



- Practice Relationship Centered Communication
- Follow a Clinical Protocol
- Have a tele-audiology infrastructure in place



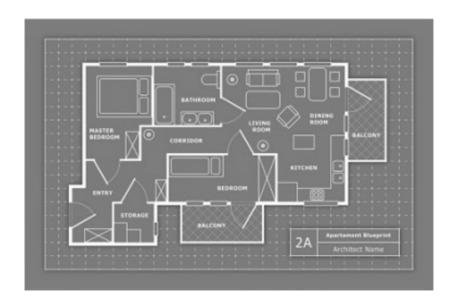
# What is a clinical protocol?



# What is a clinical protocol?



A structure or framework that increases that probability of successful outcomes



A process allowing for rapid and accurate production of an unlimited number of copies

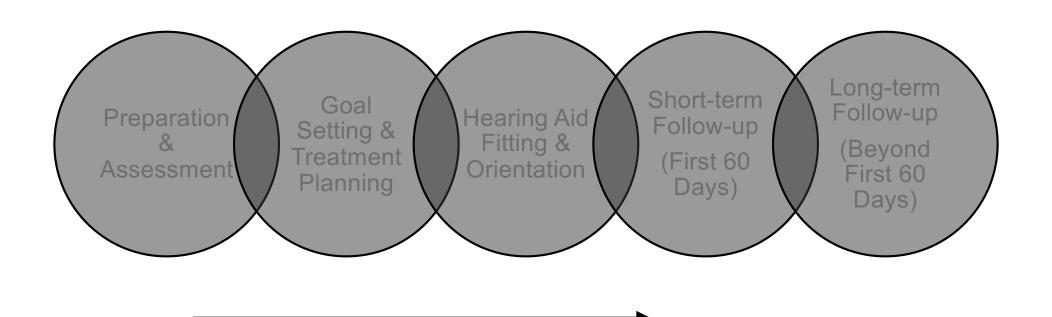
# To function, a clinical protocol must....



- Lead to outcomes that are better than random activity
- Feasible for the patient to do
- Completed in a timely manner
- Repeatable by credentialed staff
- Utilized for entirety of patient journey (for all patient-provider milestones)

#### **5 Patient Interaction Milestones**







## Aging and Cognitive Health Evaluation in Elders



#### **ACHIEVE Study**



- Randomized controlled trial, longitudinal study
- Examining the effects of hearing intervention on cognition and rates of cognitive decline in older adults.
- ACHIEVE protocol developed to provide structure in the delivery of best-practices in data collection
- ACHIEVE protocol created in 2014 by panel of audiology experts













Sanchez, Arnold, Reed, et al (2020) The Hearing Intervention for the Aging and Cognitive Health Evaluation in the Elders Randomized Control Trial: Manualization and Feasibility Study. Ear and Hearing (P-A-P).

## **Elements of the ACHIEVE Protocol**



Element	Clinical Procedure and Materials (Tools)
Comprehensive audiometric evaluation	Otoscopy, tymps & reflexes, pure tone & speech audiometry, Quick SIN in SF
Goal Setting	COSI, Review of goal attainment using standard questions on degree of change and current ability
Supporting self-management	I-ACE, Modules 1-4 RLO/C2Hear, Videos 1-4
Hearing aid verification, fitting & orientation	Standard REM, hearing aid orientation and programming procedures
Hearing assistive technology (HAT) fitting & orientation	Selection and fitting of HAT based on assessment and goals
Outcomes assessment	HHIE-S, data logging, IOI-HA, aided Quick SIN

## **Your Clinical Toolbox**







# **COSI** – goal setting

To enjoy my visits with family at dinners



#### MODIFIED VERSION OF THE CLIENT ORIENTED SCALE OF IMPROVEMENT (COSI)

Modified from Dillon, H., James, A., & Ginis, J. (1997). Client Oriented Scale of Improvement (COSI) and its relationship to several other measures of benefit and satisfaction provided by hearing aids. Journal of the American Academy of Audiology, 8(1), 27-43.

Take a moment to think about what goals you would like to achieve during the group program. Write down your goals in the table below and then number them in the box according to their order of importance. Date Needs Established: Date Outcome Assessed: SPECIFIC NEEDS DEGREE OF CHANGE Slightly Indicate Order of Significance Difference Better Better To enjoy the conversations with my friends at weekly social outings х To become more actively involved in my church group meetings х To get more of the punch lines on Netflix comedies

## **HHIE-S**



#### Hearing Handicap Inventory for the Elderly Screening Version (HHIE-S)

<u>Instructions</u>; Please check "yes," "no," or "sometimes" in response to each of the following items. Do not skip a question if you avoid a situation because of a hearing problem. If you use a hearing aid, please answer the way you hear without the aid.

	Item	Yes (4 pts)	Sometimes (2 pts)	No (0 pts)
E	Does a hearing problem cause you to feel embarrassed when meeting new people?			
E	Does a hearing problem cause you to feel frustrated when talking to members of your family?			
S	Do you have difficulty hearing when someone speaks in a whisper?			
E	Do you feel handicapped by a hearing problem?			
s	Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors?			
S	Does a hearing problem cause you to attend religious services less often than you would like?			
Е	Does a hearing problem cause you to have arguments with family members?			
s	Does a hearing problem cause you difficulty when listening to TV or radio?			
E	Do you feel that any difficulty with your hearing limits or hampers your personal or social life?			
s	Does a hearing problem cause you difficulty when in a restaurant with relatives or friends?			
	TOTAL SCORE = (sum of the points assigned to each of the items)			

E = Emotional; S = Social

#### Interpretation of score:

0-8 suggests no hearing handicap

10-24 suggests mild-moderate hearing handicap

26-40 suggests significant hearing handicap



#### International Outcome Inventory- Hearing Aids (IOI-HA)

		(IOI-HA)		
<ol> <li>Think about how mu- how many hours did you</li> </ol>	ch you used your pres use the hearing aid(	sent hearing aid(s) o s)?	over the past two wee	eks. On an average day
none	less than 1 hours a day	1 to 4 hours a day	4 to 8 hours a day	more than 8 hours a day
<ol><li>Think about the situa aid(s). Over the past two</li></ol>	tion where you most weeks, how much ha	wanted to hear bett is the hearing aid he	ter, before you got yo dped in that situatio	our present hearing n?
helped	helped	helped	helped	helped
not at all	slightly	moderately	quite a lot	very much
<ol><li>Think again about the hearing aid(s), how much</li></ol>	e situation where you n difficulty do you ST	most wanted to he TLL have in that sit	ar better. When you tuation?	use your present
very much	quite a lot of	moderate	slight	no
difficulty	difficulty	difficulty	difficulty	difficulty
<ol> <li>Considering everythin</li> </ol>	ng, do you think your	present hearing aid	d(s) is worth the trou	ble?
not at all	slightly	moderately	quite a lot	very much
worth it	worth it	worth it	worth it	worth it
		2 -		
<ol><li>Over the past two we affected the things you co</li></ol>	eks, with your presen an do?	t hearing aid(s), how	w much have your he	earing difficulties
affected	affected	affected	affected	affected
very much	quite a lot	moderately	slightly	not at all
<ol><li>Over the past two we bothered by your hearing</li></ol>	eks, with your present g difficulties?	t hearing aid(s), how	w much do you think	other people were
bothered	bothered	bothered	bothered	bothered
very much	quite a lot	moderately	slightly	not at all
<ol><li>Considering everythin</li></ol>	ng, how much has you	ar present hearing a	id(s) changed your e	njoyment of life?
worse	no change	slightly better	quite a lot better	very much better
		E	500	

Cox and Alexander, 2002





https://shrs.uq.edu.au/

#### C2Hear





https://c2hearonline.com

## **ACHIEVE Study Visits**



Visit	Timeline & Mean Time For Appt	ACHIEVE Element
1. Screening for inclusion into study	Week 0	Demographic data obtained
2. Assessment & goal setting	Week 1, 59.5 minutes	Comprehensive aud assessment, Goal setting with COSI, I-ACE and C2Hear Modules 1
3. Intervention Session A	Week 2, 75 minutes	REM, Fitting and Orientation, Review I-ACE Modules 1 & 2, and C2Hear Module 2
4. Intervention Session B	Week 4, 31.5 minutes	HA adjustments, Review/watch C2Hear module 3 & I-ACE module 3, HAT discussion with review of COSI goals
5. Intervention Session C	Week 7, 50 minutes	HA adjustments, Review/watch modules, Intermediate outcome assessment (COSI goals, IOI-HA, Aided Quick SIN

## **ACHIEVE Study Visits**



Visit	Timeline & Mean Time For Appt	ACHIEVE Element
6. Intervention Session D	Week 9, 35.5 minutes	HA adjustments, Additional HAT orientation, review C2Hear Module 4, outcome assessments (COSI goal attainment, IOI-HA)
7. Post Intervention	Week 24	HA adjustments, review all modules, additional orientation of HAT, Outcomes assessed (COSI goal attainment, HHIE, Aided Quick SIN, IOI-HA

## Results



Metric	Pre-intervention (Mean)	Post-Intervention (Mean) Week 24
Quick SIN	11.8 dB SNR (unaided)	5.3 dB SNR (aided)
HHIE-S	25.1	6.1
COSI Degree of Change		4 (on 5-point scale)
IOI-HA		30.4
Visit completion (%)	100	90.4
Binaural data logging in hours		7.3

## **Time Frames to Achieve Outcomes**



- 5 in-person visits, spread over 9 weeks
- 4.2 total hours (mean)
- Range: 3.25 total hours (minimum) to 5.3 total hours (maximum)

# To function, a clinical protocol must....



- Lead to outcomes that are better than random activity
- Feasible for the patient to do
- Completed in a timely manner
- Repeatable by credentialed staff
- · Utilized for entirety of patient journey (for all patient-provider milestones)

# From Provider's Perspective



It takes **5 in-person visits** and an average of **4.2 hours** of clinical time over the first **60 days** to optimize outcomes



# From Patient's Perspective



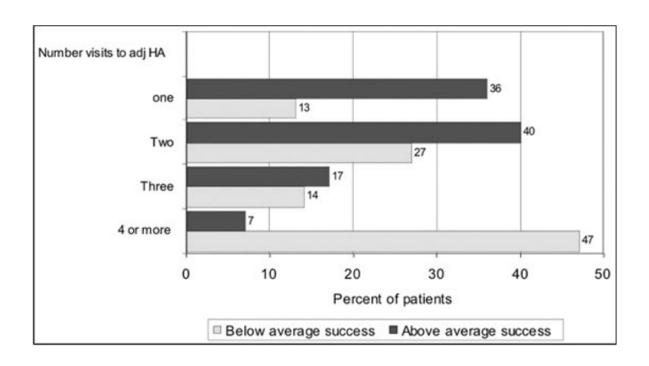
"Say what? I must find a ride here four more times?"

- 4.2 hours of clinical time = 10 or more hours of patient's time
- Drive to and from clinic
- Wait in reception area



#### **Hearing Aid Success First 30 Days**





MarkeTrak VIII: The Impact of the Hearing Healthcare Professional on Hearing Aid User Success April 2010



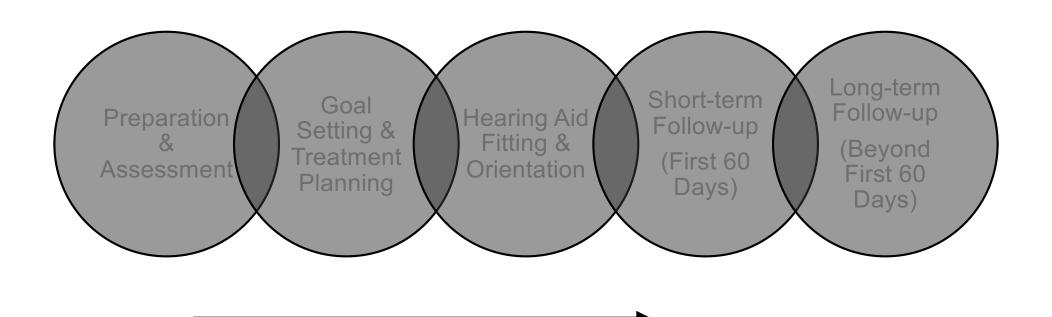
# How does a blended care model fit into optimizing patient outcomes?





#### **5 Patient Interaction Milestones**







#### **Pre-intervention Planning:**

- Stage of Change Degree of Handicap
- Expectations
- Preparation for Appointment



#### **Pre-intervention Planning:**

- Stage of Change
- Degree of Handicap
- Expectations
- Preparation for Appointment

#### In-Person Assessment:

- Review Pre-intervention Info
- Comprehensive Audiometry
- Quick SIN

#### **Pre-intervention Screening:**

- Hearing
- Risk Factors for Ear Disease



#### **Pre-intervention Planning:**

- Stage of Change
- Degree of Handicap
- Expectations
- Preparation for Appointment

#### **Pre-intervention Screening:**

- Hearing
- Risk Factors for Ear Disease

#### **In-Person Assessment:**

- Review Pre-intervention Info
- Comprehensive Audiometry
- Quick SIN

## Remote Pre-intervention Planning



- Review Expectations
  - During an in-person appointment
  - When wearing hearing aids
- Evaluate Stage of Change ("Which of the following best describes you...")
  - I don't think I have a hearing problem, therefore I am not currently a hearing aid candidate
  - I think I have a hearing problem; however I am not yet ready to act
  - I think I have a hearing problem and I intend to act in the near future
  - I think I have a hearing problem and I am ready to act now.
- Evaluate Perception of Handicapping Condition
  - Administer HHIE-S

# **Remote Pre-intervention Screening**



- 1. Hearing Screening
- 2. Risk Factors for Ear Disease





## **Effectiveness of Tele-Audiology (Remote Care)**



Early in the patient journey, here is what patients and providers say about the use of tele-audiology:

#### Patients:

"I am better prepared because I know my treatment options before the appointment"

"I know what to expect before the appointment."

"I have begun to trust the provider before I even see her in person."

#### Providers:

"I can prepare the patient before the appointment and that saves time."

"I can assess the motivations of the patient prior to the appointment."

"I have built some rapport with the patient before I have met them in person."

Based on work for Jermy Pang at NAL

# **Blended Care Summary**



- Still requires high level of professionalism:
- Relationship-centered communication
- Evidence-based implementation of protocol
- Convenience: Saves patient immense amounts of time
- Efficiency: Frees up clinical time to devote to more complex cases, more new business
- Appealing to untapped segments of market improved access

# **Suggested Reading/Viewing**



Saunders, E (2019) Tele-Audiology and the Optimization of Hearing Healthcare Delivery.

Pang, J (2020) Pre-Assessment: What audiologists say and what clients say. Biteshttps://www.youtube.com/watch?v=wb56SjsbJK4&list=UUjDfM-rcv5K-uoe4ZUmpA5w&index=7

Tele-audiology articles at Hearing Journal by Swaenpoel & Hall and G. Saunders

Dillon et al Are good outcomes driven by good devices, good clinicians, or good clients? 2018 NAL Presentation

## Thanks – brian.taylor@wsa.com

