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Teleaudiology in the VA: Emerging Technologies, presented in partnership with AVAA

Danielle Crawford, AuD, CCC-A

Gina Lindwall, AuD, CCC-A

Danielle McCall, AuD, MBA, CCC-A

Disclosures

- **Presenter Disclosure:** Financial: Danielle Crawford is employed by the Department of Veterans Affairs. Non-financial: Danielle Crawford has no relevant non-financial relationships to disclose. Financial: Danielle McCall is employed by the Department of Veterans Affairs. Non-financial: Danielle McCall has no relevant non-financial relationships to disclose. Financial: Gina Lindwall is employed by the Department of Veterans Affairs. Non-financial: Gina Lindwall has no relevant non-financial relationships to disclose.
 - In lieu of an honorarium, a donation has been made to AVAA in the form of AudiologyOnline CEU memberships.
- **Content Disclosure:** This learning event focuses on the following specific products or services and will not include info on other products or services: VA Video Connect (VVC), Automated Method for Testing Auditory Sensitivity (AMTAS), and Accessing Telehealth through Local Area Stations (ATLAS).
 - The views expressed in this presentation are those of the authors and do not necessarily reflect the official policy or position of the US Government.
- **Sponsor Disclosure:** This course is presented by the Association of VA Audiologists (AVAA) in partnership with AudiologyOnline.

Learning Outcomes

After this course, participants will be able to:

- Describe what audiology & hearing aid services can be provided virtually using VA Video Connect (VVC) and remote programming
- Describe potential settings and uses when implementing AMTAS in the clinic.
- Identify prospective patients to be seen at an ATLAS site and list services that can be provided at an ATLAS pod.

Presentation Outline:

- AMTAS
- VA Video Connect
- Remote Programming
- ATLAS

Asynchronous Telehealth Automated Audiometry

Danielle McCall, Au.D.



What is Asynchronous Automated Audiometry?



Originating Site
Acquire Data



Store Data



Distant Site
Review Data

Asynchronous TeleAudiology Virtual Team

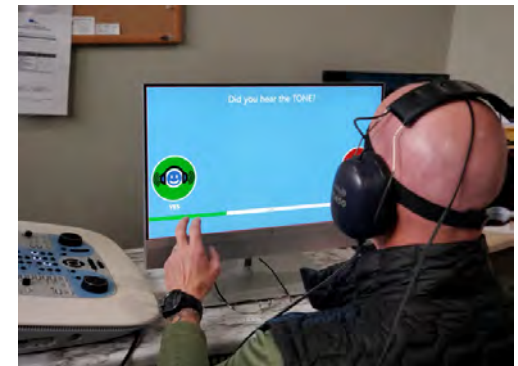
TeleAudiology Virtual Team

Imager

- Capturing the required images and data for the audiology study
- Interacting face to face with the patient

Audiology TeleProvider or Reader

- Has a doctorate or master's degree in audiology
- Specializes in evaluating and treating hearing and balance disorders
- Is the person designated to review the remote audiology study



AMTAS: Automated Method for Testing Auditory Sensitivity

Current VA TeleAudiology Asynchronous Solution:

- The Global Med Integrated Audiology Platform combines Grason-Stadler's Automated Method for Testing Auditory Sensitivity (AMTAS) audiometer software with Global Media's CapSure3 VistA software and TotalExam 3 camera.
- This combination provides a comprehensive, All-in-One (AIO) solution for obtaining a diagnostic hearing evaluation through an Asynchronous SFT encounter.

AMTAS: Automated Method for Testing Auditory Sensitivity

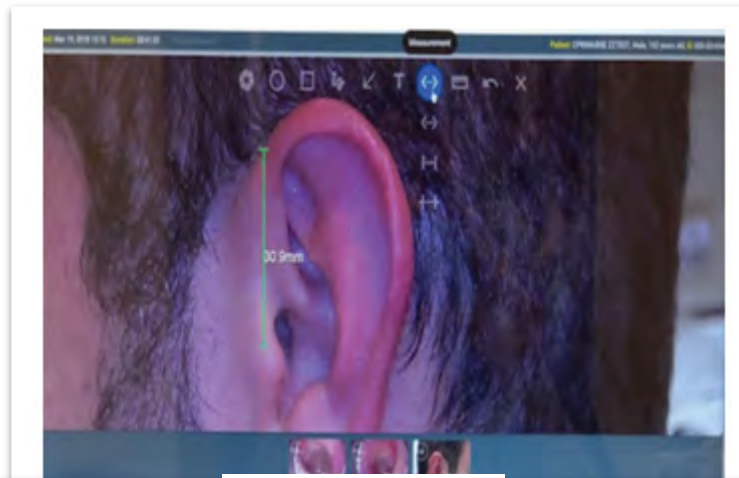
VA-supported Audiology Telehealth (ATH) Baseline software components utilized for AMTAS:

- CapSure3 VistA
- GSI AMTAS Pro Software
- Noah Module
- VistA Imaging Display

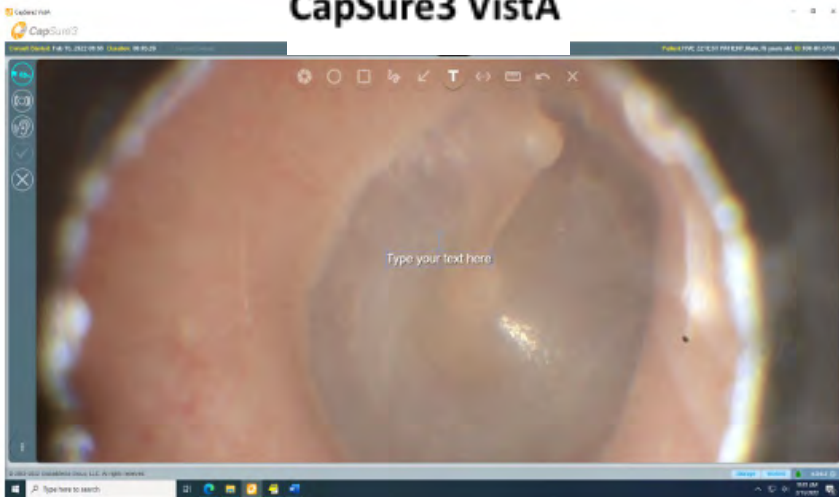
VA-supported audiometry system hardware utilized for AMTAS:

- GSI AudioStar Pro
- AIO desktop PC
- Global Media's TotalExam 3 examination camera with interchangeable otoscope and autofocus heads
- Elongated measurement tool

AMTAS TeleAudiology Software



CapSure3 Vista



GSI AMTAS Test Screens



Listen screen

Response screen

AMTAS TeleAudiology Software

GSI Suite

Right Ear

Left Ear

AC PTA: 7 dB

AC: -10 -10 -10 -10 -5 -10

BC: 45

Audiotape Edit for Z2 TEST PATIENT0007 (Age 73) as seen on APR 06, 2023 by

Device: Options/Graphs Help

Speech Audiometry: Check C: Acoustic Immittance: Graph Display

Check Acoustic Immittance: Check H:

Import Data: F10

INTENT: Z2 TEST PATIENT

EXAMINING AUDIOLIST: AUTOMATED AUDIOMETRY

REFERRAL SOURCE: Unknown

AGE AT VISIT: 73

TRANSDUCER TYPE: ☒ Airphones ☐ Inserts

TYPE OF VISIT: ☐ EAP ☒ Audiological Evaluation ☐ Other

CLAIM NUMBER:

COMMENTS: NOT ADEQUATE FOR BATHING PURPOSES. Automated method for Testing auditory Sensitivity (AMTAS)

If hearing is data there will be a warning. LOCKS the entire report and sends it to the (Person ALC)

Print Configuration:

VistA Images

Audiotape Edit for Z2 TEST PATIENT0007 (Age 73) as seen on APR 06, 2023 by TOMASSEKACHEN, A

File: Database: Options/Graphs: Help

Audiotape Edit: Pure Tone: Speech Audiometry: Acoustic Immittance: Graph Display

Import Data

	250	500	750	1000	1500	2000	3000	4000	6000	8000	10000
RIGHT											
Intact											
Failed											
Standard	15	10	15	20	30	40	65	75	70	85	
Hearing Level	0	0	0	0	10	20	45	55	50	65	
LEFT											
Intact											
Failed											
Standard	15	10	20	15	45	60	70	75	70	75	
Hearing Level	0	0	0	0	25	40	50	55	50	55	

BONE CONDUCTION (dB)

	250	500	750	1000	1500	2000	3000	4000
RIGHT								
Intact								
Failed								
Standard								
Hearing Level								
LEFT								
Intact								
Failed								
Standard								
Hearing Level								

RIGHT LEFT

INTER-TYPE COMPARISON

0000 0000

PURE TONE AVERAGE

Two: 15 12

Three: 23 28

Four: 50 55

SPS Selection Level

Initial

Standard

Left: 15

Final

Standard

Left: 15

CPRS
QUASAR/Audiogram Edit.

credit: Office of Connected Care

AMTAS TeleAudiology Hardware & Components



Grason-Stadler GSI AudioStar Pro



GSI39



All-in-One PC Workstation



Noise Monitoring Microphone



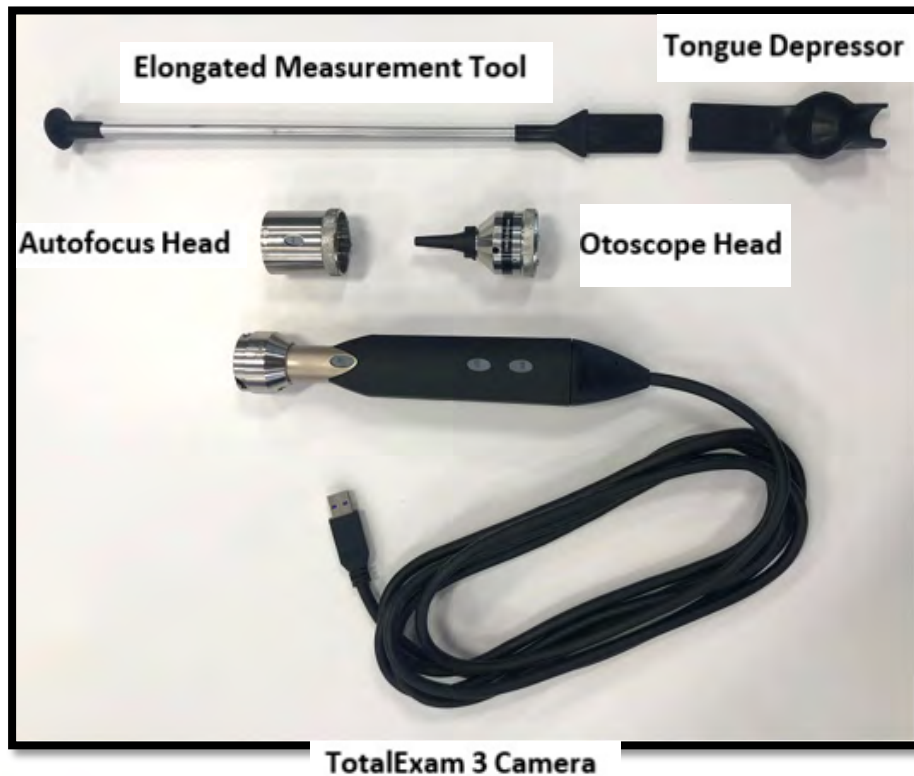
Circumaural Headphones



AMBAND and Bone Oscillator



AMTAS TeleAudiology Hardware & Components



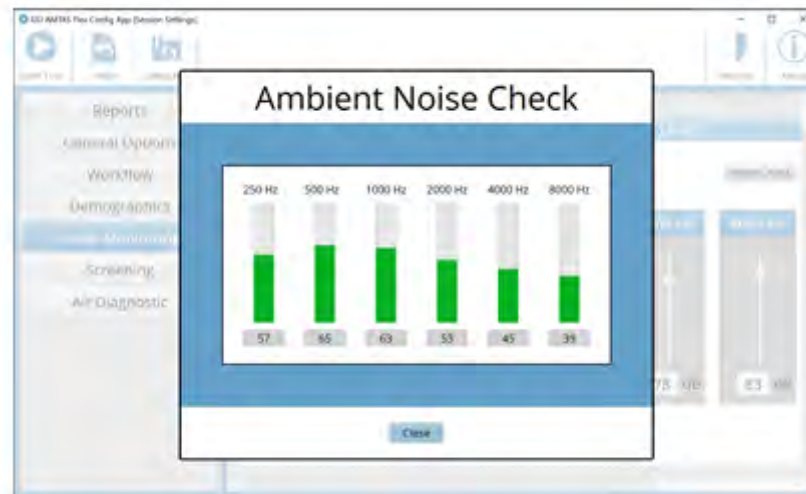
Elongated Tool with TE3 Setup

AMTAS TeleAudiology Set-Up

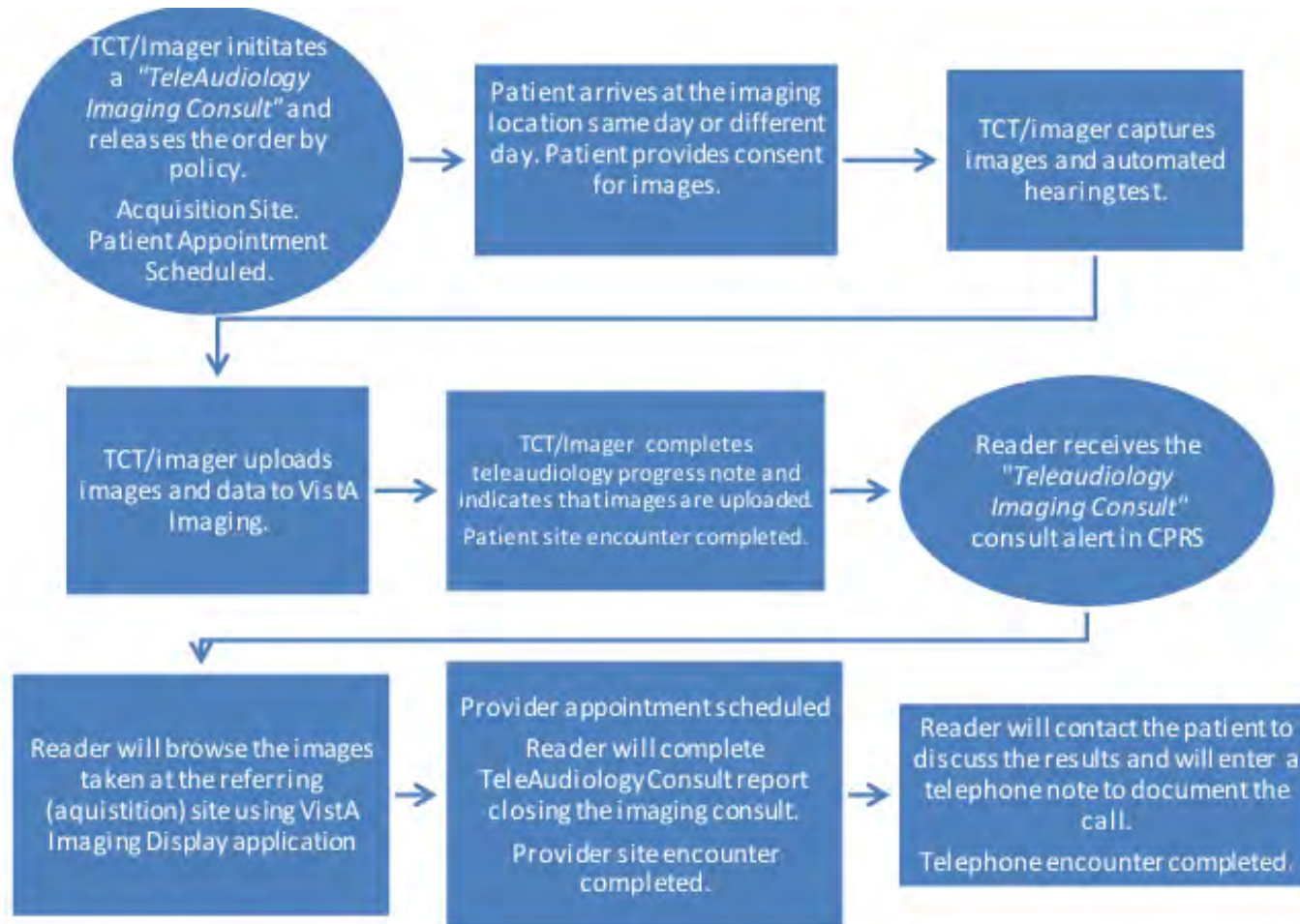


Boothless Environment & Noise Monitoring

- The level of ambient noise in the room is monitored during the patient's hearing test with the use of the noise monitoring microphone in a booth less test environment.
- The DD450 circumaural high-frequency headphones provide a significant amount of noise attenuation on their own.
- Additionally, a noise check is performed prior to bringing the patient back for their appointment to ensure the microphone is working and the environment is appropriate for testing.



AMTAS Clinical Workflow

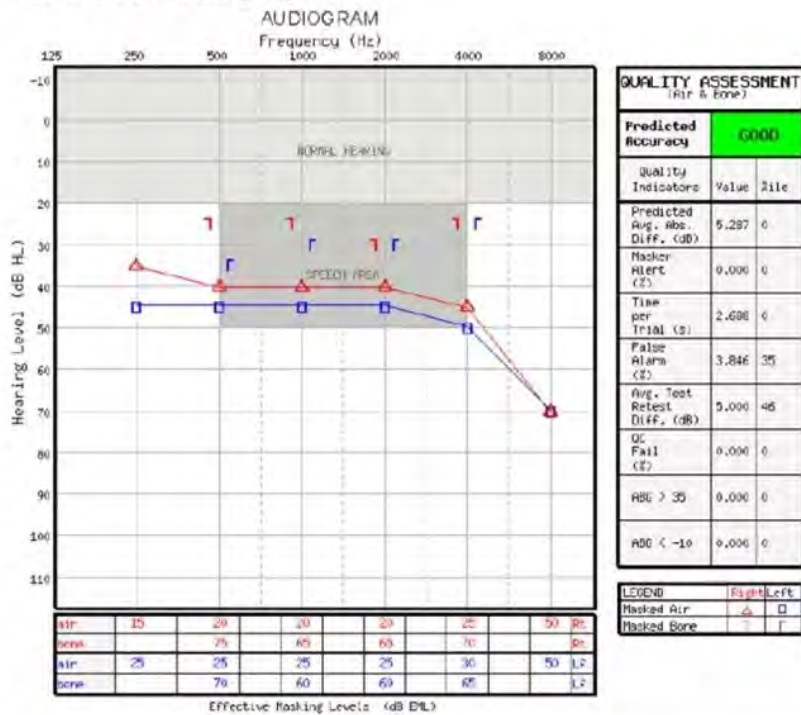


Candidacy Criteria for AMTAS

- ✓ No diagnosed or known blindness/severe vision loss
- ✓ No diagnosed or known physical limitations
- ✓ No diagnosed or known cognitive impairment or significant dementia
- ✓ No flat severe-profound degree of hearing loss
 - SRT and WRS limitations
- ✓ Previous hearing test in medical record for reference
 - Site dependent
- ✓ Any criteria as determined by local decision-makers

AMTAS Hearing Report & Quality Indicators

GSI-AMTAS™ Hearing Report



QUALITY ASSESSMENT (Air & Bone)		
Predicted Accuracy	GOOD	
Quality Indicators	Value	File
Predicted Avg. Abs. Diff. (dB)	5.297	0
Masker Alert (%)	0.000	0
Time per Trial (s)	2.698	0
False Alarm (%)	3.846	35
Avg. Test Retest Diff. (dB)	0.000	46
QC Fail (%)	0.000	0
ABG > 35	0.000	0
ABG < -10	0.000	0

Legend	Right	Left
Masked Air	△	□
Masked Bone	▽	◇

AMCLASS® Audiogram Classification				
Ear	Severity	Configuration	Site of Lesion	Bilateral Symmetry
Right	MODERATE	Flat Hearing Loss	MIXED	Symmetric
Left	MODERATE	Flat Hearing Loss	MIXED	

Speech Recognition Report										
Ear	Pure Tone		Word Recognition (NBS closed set)				Word Recognition (NBS closed set)			
	Avg dB HL	SRT	2 Conn Level dB HL	Mask Level dB HL	List	2 Conn Level dB HL	Mask Level dB HL	Mask dB HL	List	
Right	40	45	75	62	42	84	68	48	NB-3	
Left	40	45	75	67	47	92	73	53	NB-4	

1. Predicted Accuracy
2. Predicted Average Absolute Difference
3. Masker Alerts
4. Time Per Trial
5. False Alarm Rate
6. Average Test Re-Test Difference
7. Quality Check Fail Rate
8. Air/Bone Gaps >35dB
9. Air/Bone Gaps <-10dB

Ways AMTAS Can Be Utilized in the Clinic

Physical Space Issues

Inadequate Staffing

Increase Access to Care

Increase Workload Credit for Providers

Hearing Screenings



Annual Audiograms

Occupational Health
Employee Audiograms

Audiogram Monitoring Programs

Improve Appointment Efficiency

Walk-in Incorporation



Challenges & Limitations of AMTAS



Testing instructions and procedures cannot be modified during testing

Limitations on speech testing levels due to system programming

Pure tone air and bone thresholds are masked for all test points

Procurement of specialized equipment and software

Extra work for Imager and Reader

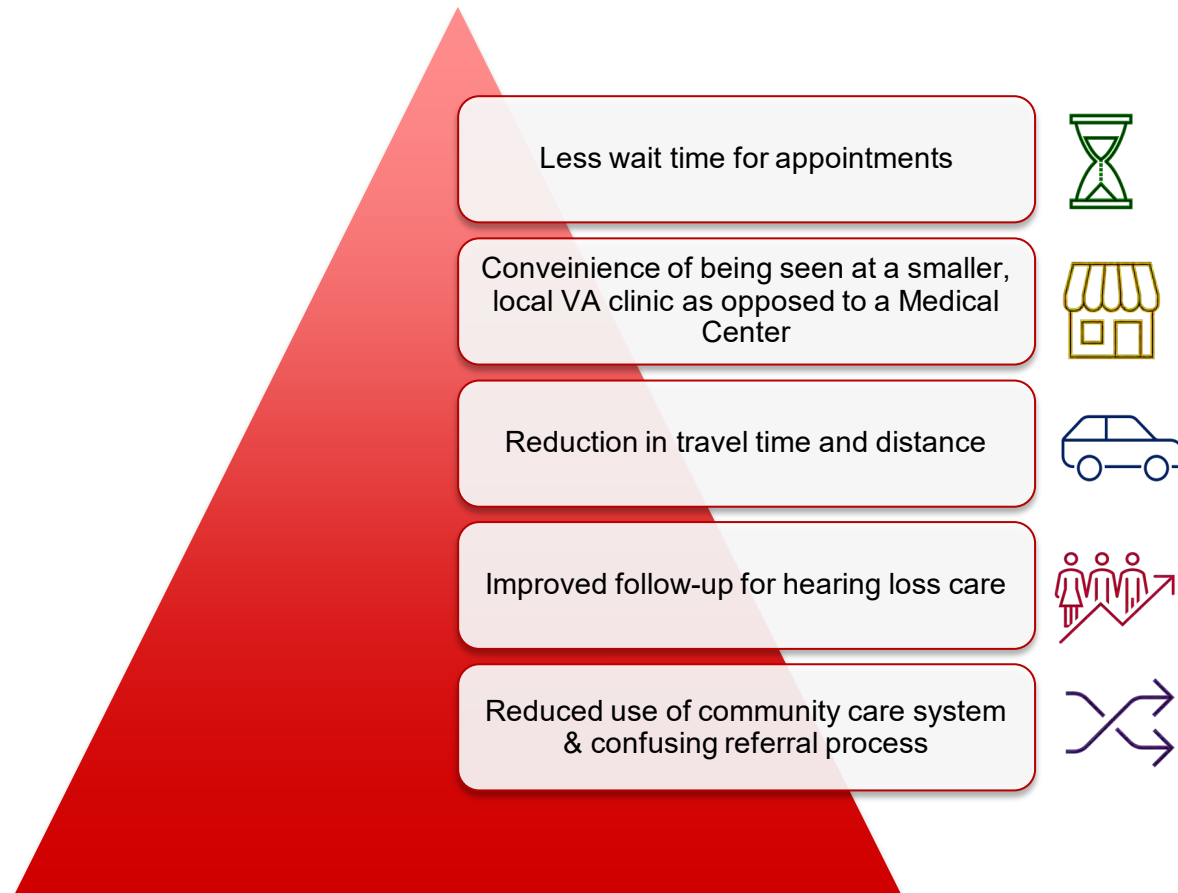
Skepticism from providers regarding test accuracy



Concern for future job outlook

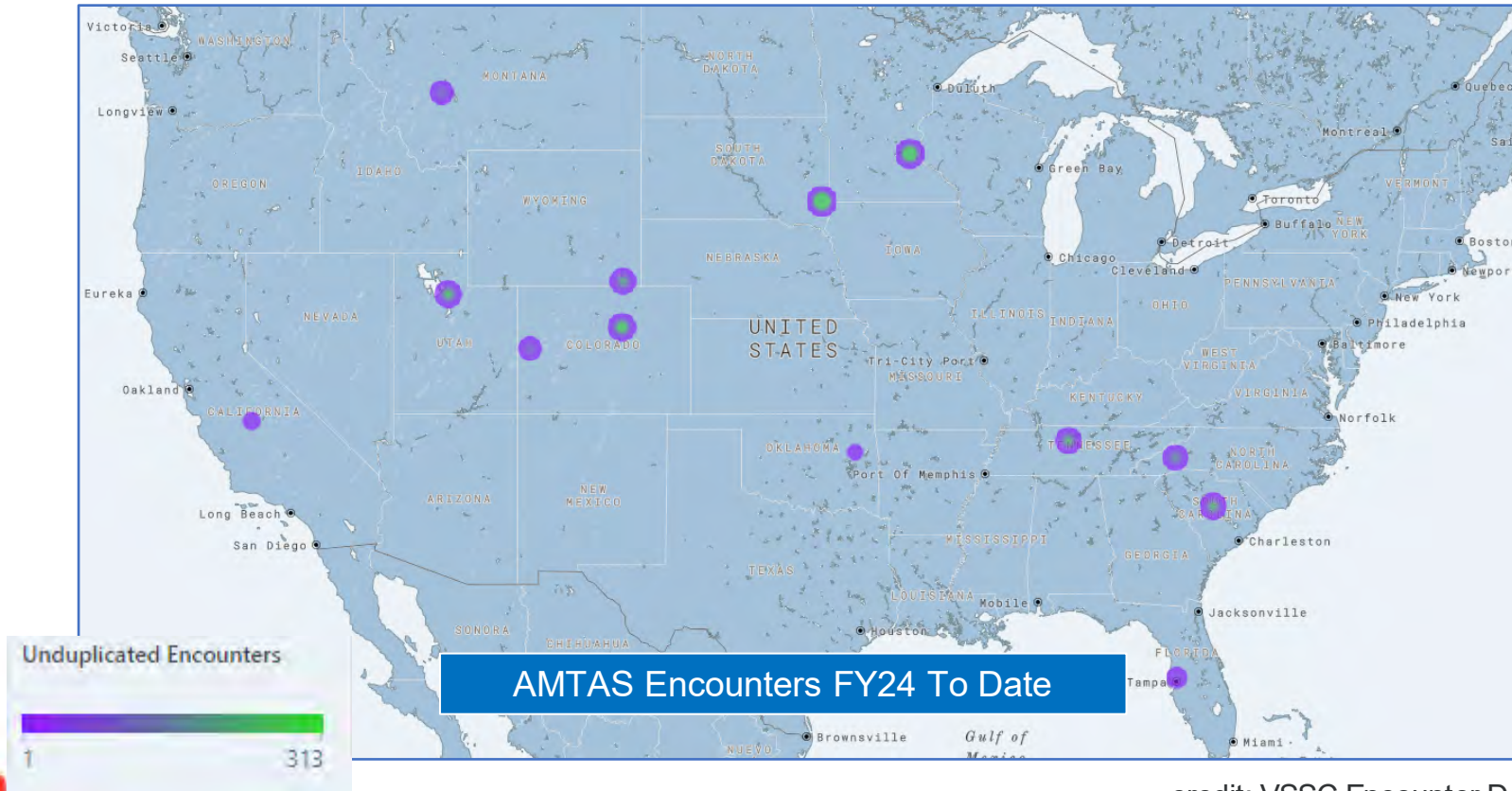


Benefits of AMTAS for the Patient



Prevalence of AMTAS Use in the VA

Telehealth Type	FY20	FY21	FY22	FY23	FY24
Store and Forward Telehealth (Patient Site)	52	223	960	1,047	1,070



VA Video Connect

Danielle Crawford, Au.D.



VA Video Connect



Current version

- 2.25.4



Regular updates based on user feedback

- Blur background option
- Easier navigation
- Office of Connected Care welcomes feedback



VVC Now

**VA Video Connect (VVC) Now**

* Required field

Create VVC Visit Now

Enter cell phone (SMS text) or email to send links for a video visit starting immediately.

- Verify contact information
- Video includes only patient and you
- [VVC Fundamentals: How To & Troubleshooting](#)

My info

* Must have one:

My Cell Phone: For text

My Email:

Additional VA Staff Email:

Patient info to send Video Link

Ensure patient is expecting link

☐ * I verify this patient agrees to receive messages about this appointment and understands that standard text messaging rates may apply. [i](#)

* Select one:

☐ Patient Phone

☐ Patient Email

Office of Connected Care Help Desk (OCCHD): [\(866\) 651-3180](#) or visit the [OCCHD Help Desk Portal](#)

e911



Available 24 hours/day, 7 days a week



Issues temporary phone number that can be dialed to reach the Veteran's local 911

- Number is active for 10 minutes



Pre-validation of address to confirm if e911 is available for the patient's address

- If not available, emergency relay center can be used



Patient should enter the address where they are located when they connect to their appointment



Available when using a different modality (e.g. remote programming)

e911

* Required field

Pre-Validate e911 Service

Enter address where Veteran will be during the time of this video visit to pre-validate that the Emergency Service is available for the address.

Name:

Location:

* Street Number:

* Street Name:

Additional Detail:

* City:

* State:

* Zip Code:

Pre-Validate Address

If unable to obtain an Emergency Contact Number call the Emergency Call Relay Center at 267-908-6605 to speak with an operator for manual relay to 911. **Do not make test calls.**

Enhanced 911, e911, VA Video Connect Visit |
Emergencies | VHA Telehealth Services Intranet

CAPS-LOCK

C: Consent

A: Address

P: Phone number

S: Survey

LOCK



Virtual Care Manager (VCM)



Video Platform can be customized with clinician preferences

- Contact Information
- Notifications
- Clinic schedules



Patient Scheduling



Use link in VCM or email link to join appointment

Create Video Visit

* I, DANIELLE CRAWFORD, will be leading this video visit:

☒ Yes
 ☐ No

MY INFORMATION

* My Email for Appointment Notifications:

danielle.crawford@va.gov

My Cell Phone for Appointment Text Notifications:

(225) 955-2386

Not shared with patients

Save my contact information in Preferences. This will be used for future appointments.

ATLAS INFORMATION

Patient prefers an ATLAS appointment

☒ No
 ☐ Yes

APPOINTMENT DATE & TIME

* Date: 05/20/2024
 * Time (MST): 07 : 50
 * Duration: 20 minutes

Add Another Date

* VETERAN MEETING PARTICIPANT

Ways VA Video Connect Can Be Used



Hearing Aid Fittings & Orientation

(Demonstration hearing aids)



- Previous hearing aid user
- Tech savvy
- Open-fit devices



- ✓ Complete audiometry & selection
- ✓ Use demos to obtain program settings
- ✓ Complete real ear measures
- ✓ Order hearing aids



2 weeks prior to virtual appointment:

- Save program settings to device(s)
- Mail devices & packet of information
 - Bluetooth/App set-up
 - Encourage full-time, daily use



Hearing Aid Adjustments & Orientation:

- ✓ Fine tune adjustments
- ✓ Review function, cleaning/maintenance, etc.
- ✓ Button Functionality
- ✓ Trial period, warranty, DLC supplies

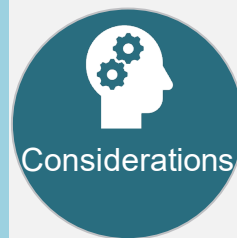
Hearing Aid Follow-up Care



- ✓ Activate remote programming on ALL fittings
- ✓ Pair phone & apps at fitting
- ✓ Give brief tutorial on app & remote programming



Every Veteran is remote programming ready



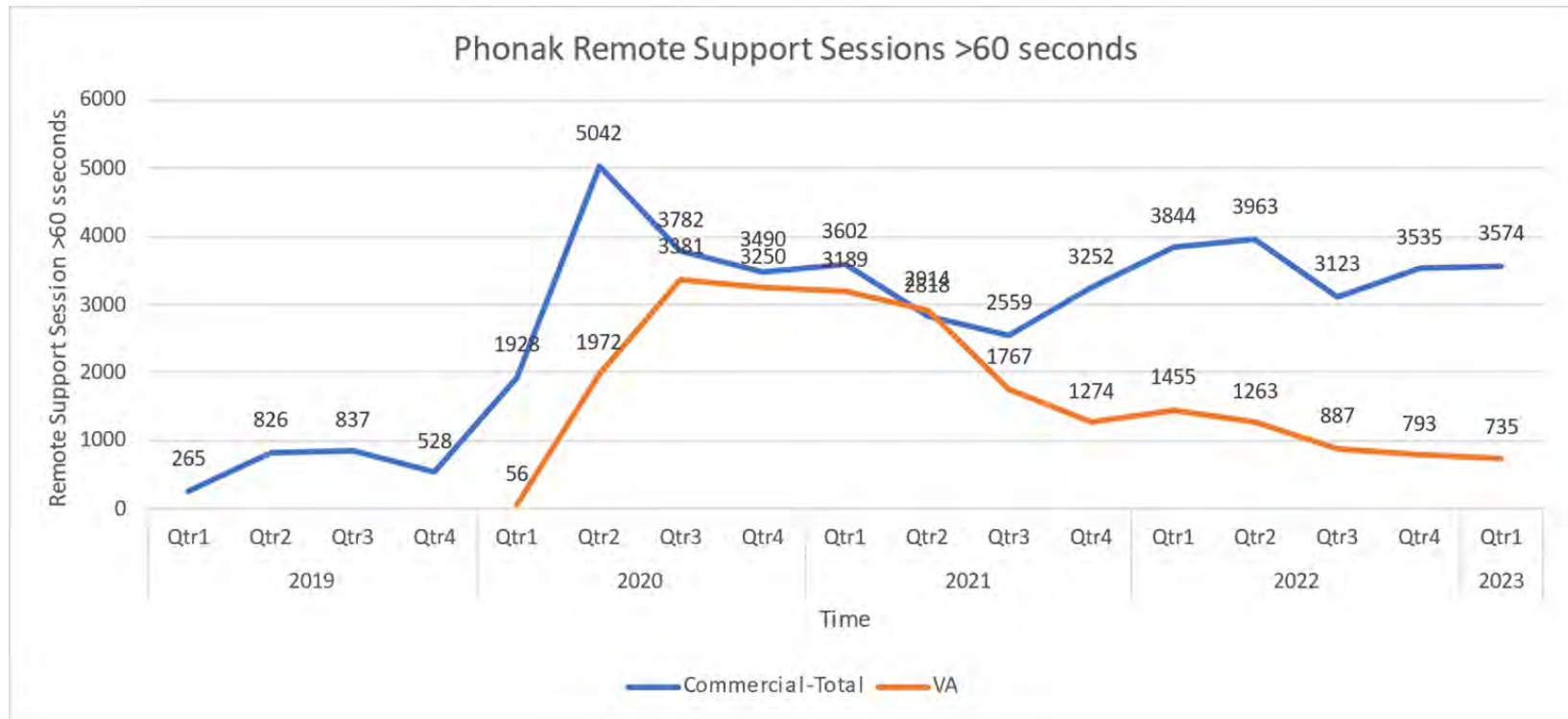
- ✓ Encourage Veterans to request remote programming when scheduling
- ✓ Document remote programming readiness in CPRS note
- ✓ Schedulers offer remote programming appt

VVC as a gateway to Remote Programming

- ✓ Useful tool prior to remote programming
- ✓ Can ensure all the connections needed are working
- ✓ Better able to assist patient with troubleshooting

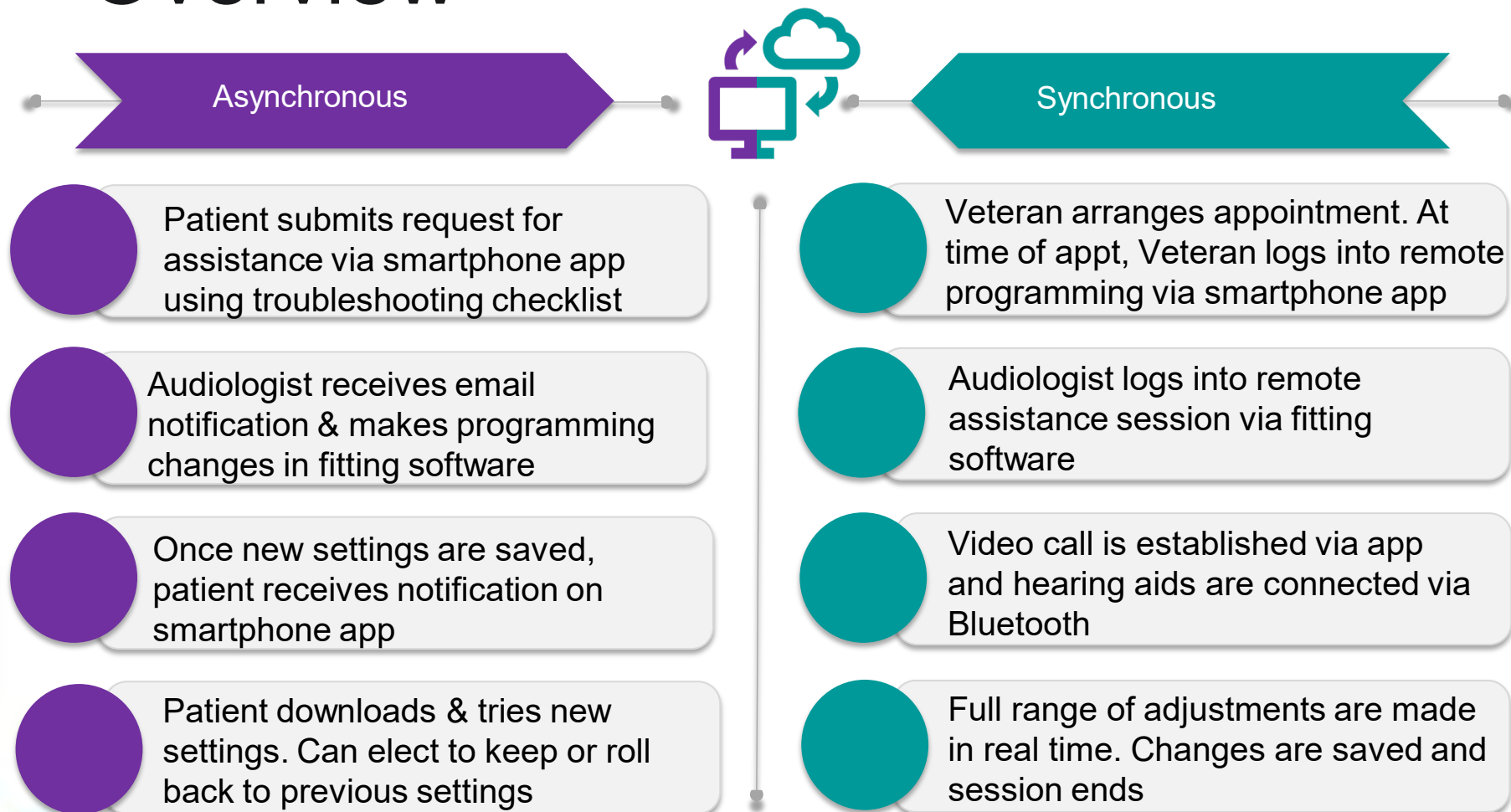


Use of Remote Programming in VA



Courtesy: Phonak

Remote Programming Applications: Overview



Remote Programming Applications: Overview

Requirements

- Smart phone/app
- Stable internet connection
- Activation in programming software?



Limitations

- Unable to complete REM
- Depending on manufacturer, may be unable to:
 - Create/Delete programs
 - Adjust tinnitus sound generator
 - Feedback calibration
 - In-situ audiometry
 - Firmware updates

Overcoming Barriers: Patient Buy-In

Who makes a good candidate?

- Has smart phone
- Tech savvy
- Uses email
- Support at home

What are common obstacles?

- Internet access
- Computer skills
- Lack of familiarity with cell phone/apps
- Unaware remote care is available

How can we promote?

- Clinic signage & handouts to promote awareness
- Educate every patient on availability of remote programming
- Demo in the clinic: show them how easy it is!
- Promote convenience and accessibility benefits:
 - Quicker access to appointments
 - Great for snowbirds, homebound, rural patients, etc.

GET HEARING
AID ADJUSTMENTS
AT HOME

Need your hearing aids adjusted, but can't get into the clinic for an in-person appointment?

We can adjust your hearing aids virtually... All you need is a smart phone.

Ask your Audiologist for more information or contact us to arrange a virtual appointment.

VA U.S. Department of Veterans Affairs

The poster is a vertical rectangle with a blue border. The top half has a white background with the text "GET HEARING AID ADJUSTMENTS AT HOME" in blue. To the left of the text is an image of a hand holding a black smartphone. The bottom half has a blue background with white text. On the right side of the bottom half is a close-up image of a person's ear with a hearing aid. At the bottom of the poster, on the left, is the "VA" logo, and on the right is the U.S. Department of Veterans Affairs seal and name.

Overcoming Barriers: Clinician Buy-In

What are common obstacles?

- Lack of training
- Comfort level
- Assumptions about patient
- Learning front-end set-up
- Navigating connectivity/technical issues
- Lack of availability of certain procedures (REM)
- Issues needing hands-on care: fit, earmolds, etc.

How to promote amongst clinicians?

- Have a champion in your clinic
- Regular in-service trainings
- Provide time for 1:1 training with manufacturers
- Full day of virtual clinic each week
- Opportunity for telework
- Rewarding to see patient success/satisfaction



Case study: Expanding VVC



Staffing

- 3 Audiologists
- 1 Tech
- 1 MSA



Clinic Space

FY 21: 1100 Sq Ft



Virtual Visits

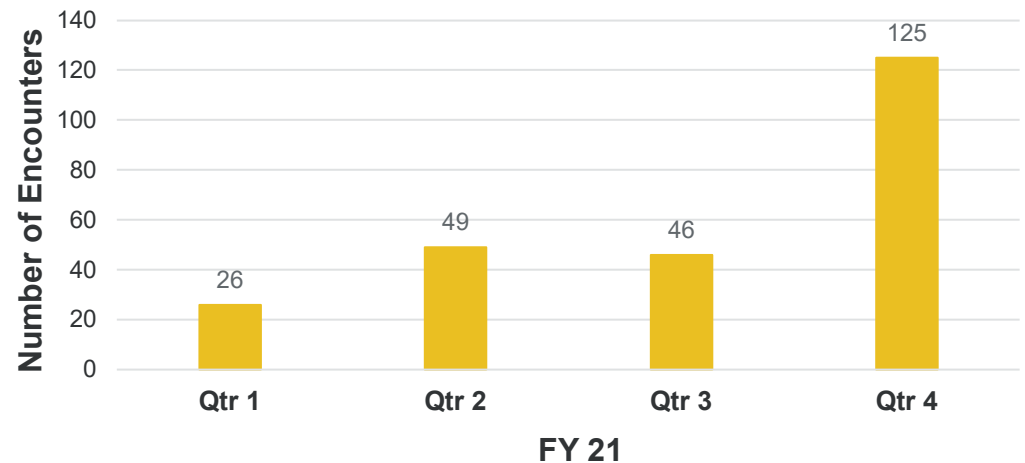
FY 21: 0-4 encounters per provider weekly



Wait Time

FY 21: 44 days

Virtual Encounters: Northwest Phoenix
CBOC



Case study: Expanding VVC



Virtual Visits

FY 22: **6-9** encounters
per provider weekly



Clinic Space

FY 22: 1100 Sq Ft

+

Telework



Staffing

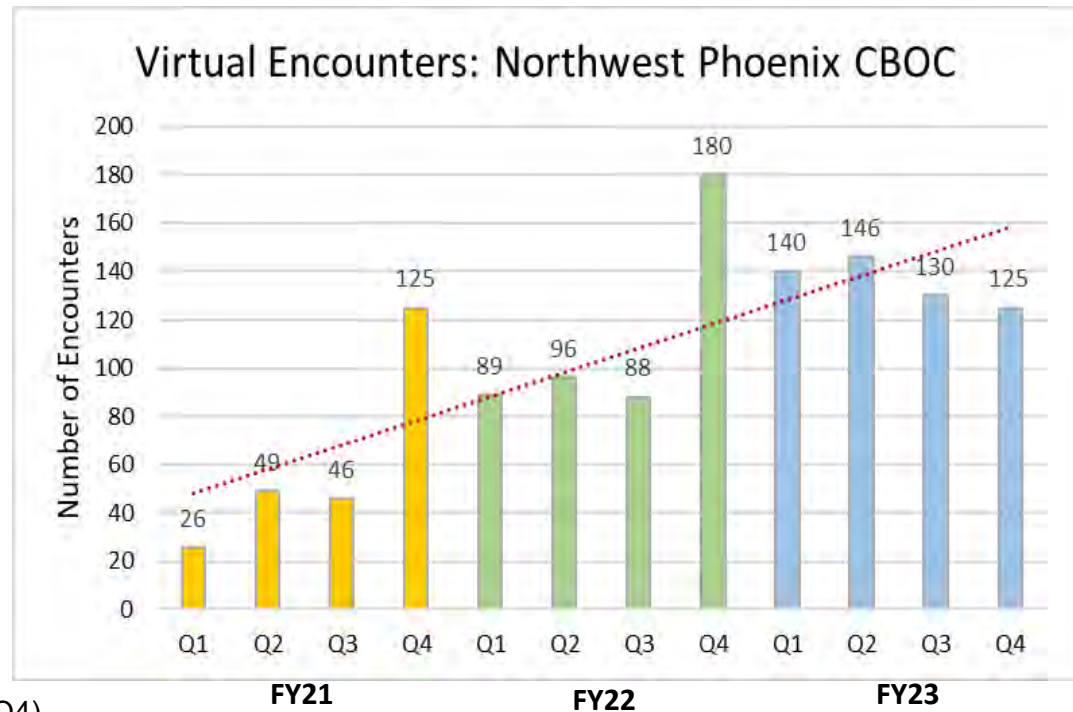
- **4** Audiologists
- 1 Tech
- 1 MSA



Wait Time

FY 22: 28 days (avg for Q4)

FY 23: **24 days**



Emerging Technology: ATLAS

Accessing Telehealth through Local Area Stations

Gina Lindwall, AuD



Credit: Office of Connected Care

Emerging Technology: ATLAS

- Goal: Enhance accessibility of VA services
 - Provide private, secure environment for appointments in the community
 - Provide necessary video equipment and internet access with on-site troubleshooting and check-in process
 - VA-Video Connect (VVC)
 - Reduce travel time to nearest VA

Credit: Office of Connected Care



Credit: Office of Connected Care

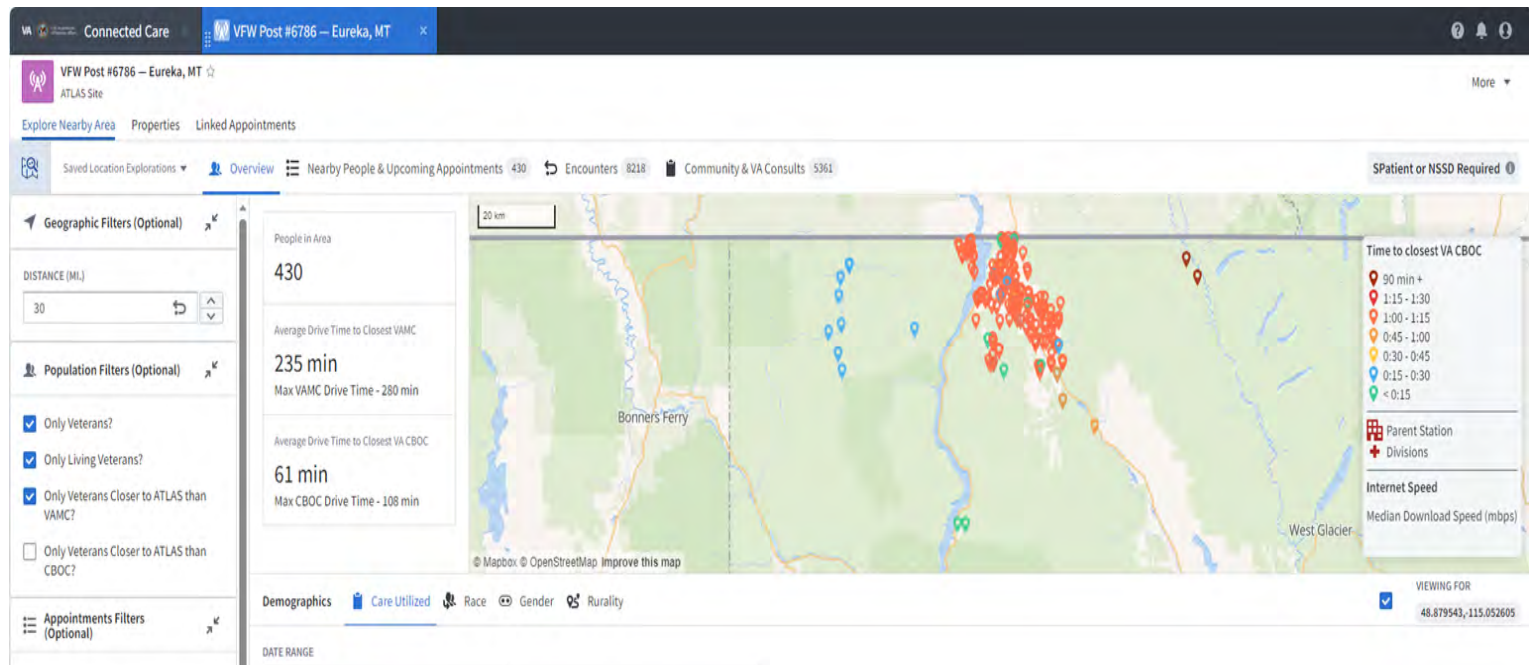
ATLAS in Eureka, MT

- VFW
- First ATLAS site to include Audiology services
 - Appointments began 8/2023
- Available services:
 - ✓ 4-week hearing aid fitting follow-ups
 - ✓ Hearing aid troubleshooting
 - ✓ Remote programming
 - ✓ ALD fitting and follow-up
 - ✓ Tinnitus education



ATLAS Scheduling Process

- Identify potential ATLAS candidates using dashboard tool:



Credit: Office of Connected Care

ATLAS Scheduling/ Check-In Process

- Provider calls potential patients, explains services provided at the pod, and explains scheduling and check-in process
 - Veterans may also contact schedulers directly to request ATLAS appointment
- Provider contacts scheduler to set up appointment
- Scheduler calls patient to confirm appointment date and time and provides 6-digit numeric code for appointment
 - Patient receives letter with the information
- Once at the ATLAS site, patient checks in with VFW attendant who logs into video appointment
- When provider also logs in, attendant leaves room
- Continue with video appointment procedures

ATLAS: Strengths

- ✓ Positive Veteran qualitative feedback
- ✓ Saves travel time and bridges digital divide
- ✓ Bolsters partnership between VA and service organizations
- ✓ Have designated scheduler for Audiology ATLAS appointments
- ✓ Site attendant available for Veteran check-in, connecting to video appointment, and for equipment troubleshooting

ATLAS: Challenges

- ✓ Occasional VA-Video Connect and related equipment breakdown
- ✓ Reliance on strong Wi-Fi connection
 - Remote programming tricky inside the pod
- ✓ Subset of Audiology services available
- ✓ No TCT present
- ✓ Unique six-digit code needed for appointment that Veteran may forget to bring

ATLAS: Future Directions

- ✓ Potential to provide AMTAS services and follow-up IF peripherals could be used in future
- ✓ Expand services to University sites in Missoula and Bozeman
 - Opportunity to offer tinnitus education
- ✓ Clinical champions to provide support to other sites interested in offering Audiology services at ATLAS locations

ATLAS Marketing Initiatives

- Open house: 9/20/2023



- Education provided to home-based primary care team at nearest VA
- Site visits with representatives from Veterans Experience Office and ATLAS program office scheduled for all 3 Montana ATLAS sites
 - June 2024

ATLAS Best Practices

❑ Identify Veteran needs

- ✓ Use ATLAS dashboard tool to identify Veterans who may benefit from ATLAS Audiology services
- ✓ Determine which clinical services could be appropriate for the Veteran population near the ATLAS location

❑ Identify clinical champions

- ✓ Confirm appropriate services to provide
- ✓ Develop clinical schedule and confirm availability with ATLAS site
- ✓ Identify scheduler and ensure proper training to schedule ATLAS appointments

❑ Continue collaboration between VA and VA Service Organizations (VSOs):

- ✓ Promotion and expansion of services
- ✓ Troubleshooting equipment

ATLAS: Best Practices, Continued

- ❑ Foster ongoing communication among VA provider, scheduler, and Veterans
 - ✓ Verify patient has unique appointment code and call patient/send letter prior to appointment with code
 - ✓ Provide assurance that ATLAS pod is open for appointment even if VSO would typically be closed at that time
- ❑ Provide outreach to VA staff, VSOs, and Veterans
 - ✓ Develop Audiology-specific marketing materials to display at pod and VA clinics
 - ✓ Inform appropriate clinics and providers regarding ATLAS services
- ❑ Host an open house to increase awareness
 - ✓ Showcase pod and demonstrate telehealth appointment
 - ✓ Have informational packets available
 - ✓ Services provided
 - ✓ Local contact information

ATLAS: Case Study

- Patient: 75-year-old Veteran with 2022 hearing aids
- Lives in Eureka, MT
- **Visit 1:**
 - Overall pleased with benefit from hearing aids
 - Reviewed care and use
 - Difficulty hearing on cellphone
 - Poor retention from hearing aid domes
 - Intervention:
 - ✓ Provide tech support phone number for Bluetooth cellphone connection
 - ✓ Send other dome sizes to patient for trial
 - ✓ Follow-up in 4 weeks

ATLAS Case Study

- **Visit 2:**

- Tried different dome sizes and settled on a new size for good retention
 - Ensured patient is comfortable ordering correct supplies
- Found cellphone not compatible
- New concern: difficulty hearing soft-spoken wife
 - ✓ Intervention: Order remote microphone, send to nearest VA to process the new equipment, then mail to patient
 - ✓ Follow-up in 4 weeks

ATLAS Case Study

- **Visit 3:**

- Verified patient has received the remote microphone and paired it to hearing aids
- Reviewed care and use of the microphone
- Patient pleased with benefit from the hearing aids and remote microphone
- No further follow-up scheduled
- Ensured patient has clinic contact information:
 - ✓ Nearest VA for hearing evaluation
 - ✓ How to schedule additional ATLAS appointments, if needed

Summary

- AMTAS, VVC, and ATLAS technologies can all be used to enhance access to VA TeleAudiology services
- AMTAS:
 - Helps to overcome inadequate staffing and physical space limitations
- VVC and Remote Programming:
 - Allows for delivery of a variety of audiological services and hearing aid follow-up care while Veteran is at home
- ATLAS:
 - Saves travel time and provides private, secure environment with necessary equipment and internet connection in a community location

Thank you!

Danielle Crawford, AuD, CCC-A

Gina Lindwall, AuD, CCC-A

Danielle McCall, AuD, MBA, CCC-A

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