The Rotary Hearing Center of San Felipe

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Introduction

The Rotary Hearing Center of San Felipe Mexico opened in March 2018 with the goal of creating a sustainable humanitarian audiology services delivery model, using telehealth, that can be replicated in other under-served areas. The common short-term humanitarian mission model does not allow for sustainable services that continue beyond the period of the service visit. The tele-audiology model established in San Felipe overcomes this limitation and helps to bridge the gap between the demand for hearing healthcare and the available supply for individuals in a developing country.

SF Telehealth Model & Aims

Tele-Audiology is the delivery of audiological services and information via telehealth technologies using either synchronous and/or asynchronous approaches.

Synchronous Real Time

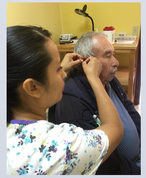
- Live bi-directional interaction between technicians, patient, and remote audiologist

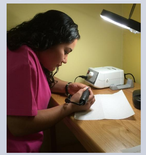
Asynchronous Store & Forward

- Technician-provided services reviewed retroactively by audiologist

The SF telehealth project primarily uses Synchronous Real Time interaction using this model:

- Tele-audiology services provided 2 half days weekly
- Technicians work face-to-face with patients at the SF Clinic
- ASU Audiologist/AUD student supervise from a remote site
- On-site SF physician provides medical support as needed

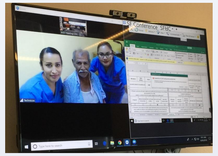


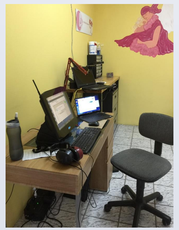


Tele-Audiology Set-Up

Videoconferencing equipment (ASU & SF sites) includes:

- Zoom video conferencing software
- Teamviewer remote desktop software
- Logitech C930e 1080P HD video webcams
- Jabra Speak 410 conference speakerphones



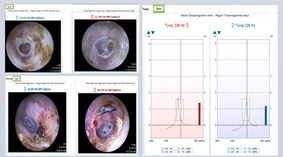


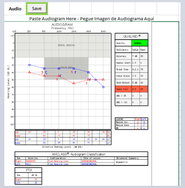
Audiology-specific hardware and software at the SF Clinic includes:

- AMTAS (Automated Method for Testing Auditory Sensitivity)
- Interacoustics Viot Video Otoscope
- Interacoustics Titan tympanometer
- Manufacturer fitting modules/HiPro box

Telehealth Services Provided

Diagnostics	Treatment	Aftercare
• Case History • Video Otoscopy • Tympanometry • AMTAS Audiogram	• Cerumen removal • Hearing aid fitting • Temporary and permanent earmolds • Counseling	• Hearing aid adjustment • Troubleshooting • Earmold modification • Outcome Measures





Appointment & Patient Demographics

Between March 2018 to February 2019, 293 appointments were scheduled. Figure 1 shows the appointment totals. No-show visits were high, yielding a total of 221 patients seen to date. Of these patients, 54% were female and 45% were male. The age range was 4 years to 87 years. The average patient age was 58 years old.

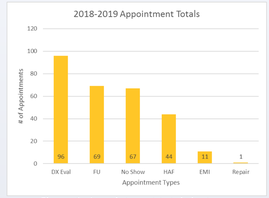
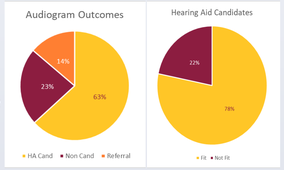


Figure 1: Appointment totals by type



Figures 2 and 3: Outcomes and Candidates

As shown in Figures 2 and 3, 63% of patients tested were hearing aid candidates, 23% were not candidates, and 14% were referred for medical treatment. 78% of the hearing aid candidates were fit with hearing aids while 22% were not.

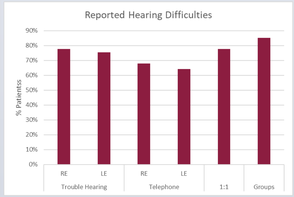


Figure 4: Case History Report of Hearing Difficulty

During the case history, patients were questioned regarding their self-perceived hearing difficulties, which are shown in Figure 4.

Patients were also questioned regarding their otologic history and current symptoms. More than 50% of patients reported noise exposure and tinnitus.

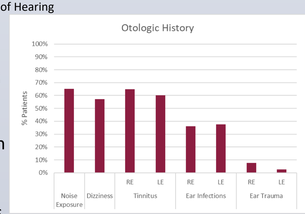


Figure 5: Case History Report of Otologic Complaints

Hearing Aid Fitting Outcomes

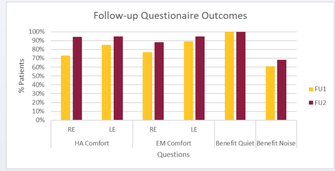
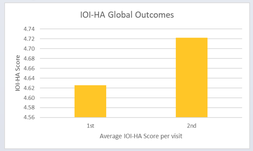


Figure 6: Follow-up Questionnaire Outcomes

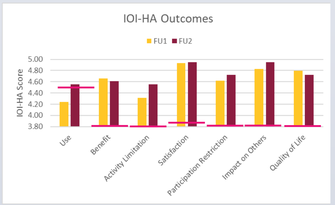
Responses to the follow-up questionnaire documented >88% satisfaction with hearing aid and earmold comfort and benefit in quiet settings. Satisfaction in background noise was 68%.

Figure 7: IOI-HA Global Outcomes



The mean global IOI-HA scores documented improvement in scores from the 1st to the 2nd post-fit follow-up and an average rating of 4.72 at the 2nd follow-up.

Figure 9: IOI-HA Domain Outcomes



The mean IOI-HA scores across different outcome domains are shown in Figure 9. Compared to IOI-HA norms (Cox et al, 2003), hearing aid outcomes exceeded the mean group data reported by Cox et al, 2003 across all domains (red lines).

Self-report data regarding hours of hearing use revealed a wearing time of >5 hours for the majority of patients. Datalogging supported these data.

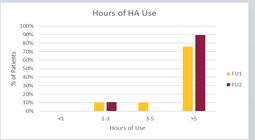


Figure 10: Hours of HA Use

Successes & Challenges

Successes

- Skilled technicians via training modules and hands-on training
- Ability to provide consistent aftercare services
- Live interaction is very effective

Challenges

- Technical difficulties (slow internet speed) can arise
- Language barrier is sometimes problematic
- High no-show rate (reasons unknown, could be cultural or transportation related)

Conclusions

The Hearing Center of San Felipe successfully implements a sustainable humanitarian audiology model using teleaudiology. Keys to a successful telehealth program are 1) the hardware/software setup to permit live interaction or testing for later review, 2) dedicated and well-trained technicians at the host site, and 3) support from the ASU clinic. With this setup, the audiologist has the eyes, ears, and hands to ensure patient-centered care and best practice. The SF tele-audiology model has increased access to hearing healthcare in San Felipe Mexico. Compared to short-term mission projects, the telehealth humanitarian model allows for ongoing provision of services (weekly) and greater sustainability and continuity of care through aftercare services. The impact of the program is evident in the patient outcomes data (IOI-HA). Phase I of the SF project focused on the provision of services and hearing aids to Mexican residents of the municipality of Mexicali. Phase II of the project will offer these same services to American and Canadian residents at a reduced fee. The revenue stream will provide the needed funds to continue to serve the local population at no cost after grant funds have been exhausted.

References

Cox, R. M., Alexander, G.C., & Beyer, C. M. (2003). Norms for the International Outcome Inventory for Hearing Aids). *Journal of the American Academy of Audiology*, *14*(8), 403-413.

Acknowledgments & Contact

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