INTRODUCTION

Remote microphone technology (RMT) significantly enhances speech recognition in noise for people with cochlear implants (CI) by providing improved signal-to-noise ratios. To optimize the listening advantage provided by RMT in multiple settings, it is important to perform a listening check when fitting CI and RMT systems to verify the output and overall sound quality. The connection between CI and the RMT varies widely depending on the manufacturer and model of the CI. An RMT system requires two key components: (1) a receiver (integrated [RogerDirect, 20, 21], universal [Roger X]), incorporated into the sound processor itself, and/or a streamer), and (2) a transmitter (proprietary remote microphone, Roger Pen, Roger Select, etc.). Phonak Roger is a popular RMT system with a variety of products for users with different listening needs at home and school, in social situations, work environments, meetings, or sports. Unlike the universal listening check protocol for hearing aids, the protocol for cochlear implants varies by manufacturer and model of the speech processors.

PURPOSES

For an on-the-ear speech processor from each of the three CI manufacturers—Advanced Bionics, Cochlear, and MED-EL—this study had two purposes: 1. Provide a guide of connectivity options and the corresponding set up for listening checks with and without the RMT. 2. Identify smartphone app features for checking connectivity and CI function.

METHODS

Research was completed for three speech processors as shown in Table 1.

RESULTS

Step 1: Listening to the RMT

- Set up as indicated then present audio input to the transmitter

- **Induction neck loop**
  - Plug compatible headphones into the induction neck loop

- **Roger 21**
  - Attach Roger 21 to the Roger 21 adapter and plug into the Mtx audio checker. Then plug in compatible headphones.

Step 2: Listening to the sound processor without RMT

1. **Connect the SMTD adapter and headphones to the SMTD**
2. **Turn SMTD volume to minimum**
3. **Activate monitoring mode in the app or press the following button on a remote control connected to SP:**
   - M button
   - FineTuner For VUs
   - MT button
   - FineTuner Echo For V1.5s
4. **Center the SP in the SMTD adapter**
5. **Provide audio input to the SP's microphone and check the signal with the headphones**

Step 3: Listening to the sound processor with RMT

Perform step 2 with indicated setup below. Then present audio input to the transmitter

- **Induction neck loop**
  - Plug compatible headphones into the induction neck loop

- **Roger 21**
  - Roger 21 installed on the SP
  - Roger 21 connected to a transmitter

- **MED-EL Audio Link**
  - MED-EL Audio Link connected to the SP

- **Roger X & FM battery pack cover**
  - Roger X plugged into the FM battery pack cover
  - Roger X connected to a transmitter

Table 1. Currently available speech processors for three cochlear implant manufacturers and their remote microphone technology connectivity options.

Advanced Bionics Naida/Sky Marvel CI – No adapter needed

Cochlear Nucleus 7 – Roger 20 adapter and Nucleus 7 battery

MED-EL Sonnet 2 – Roger 21 adapter and M90 listening check module

Table 2. Smartphone App Features for Checking Connectivity and Cochlear Implant Speech Processor Function.

CONCLUSION

This guide reflects the most up to date technology available through March 2021, and provides a valuable resource for parents, CI and educational audiologists, and CI users to help in selecting, fitting, and troubleshooting CI with RMT systems.

ACKNOWLEDGEMENTS

Special thanks to all the manufacturer representatives for providing verification of the information on this poster.

REFERENCES


*Chi Tran, BS, Allison Woodford, BS, Kitrie Howell, BS, and Linda Thibodeau, PhD

The University of Texas at Dallas