

Presentation: The Future Is Now: Disruptive Technologies Affecting Service Delivery In Speech-Language Pathology & Audiology

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Introduction: The Future is Now

This handout complements the presentation on disruptive technologies in speech-language pathology and audiology, covering advancements that will revolutionize service delivery. You will find an overview of key technologies, strategies for integrating these tools into practice, and actionable tips you can apply immediately.

Key Technologies in Speech-Language Pathology (SLP) and Audiology

1. Artificial Intelligence (AI) and Machine Learning

AI is transforming both fields by automating processes and enhancing treatment outcomes. AI tools in SLP can assess speech samples, generate real-time feedback, and create personalized therapy plans. In audiology, AI optimizes hearing aid performance, improves cochlear implant programming, and predicts patient outcomes.

- **Tips for Use:**
 - Incorporate AI-driven tools for real-time progress tracking during therapy sessions.
 - Use AI in hearing aids for predictive adjustments in sound quality based on environmental inputs.
 - For SLPs, utilize AI platforms such as ChatGPT to generate lesson plans and therapy materials.
- **Tools to Explore:**
 - **Starkey Livio AI** (for hearing aids)
 - **HearX Group AI solutions** (for hearing and auditory health)
 - **AI Tutor Systems** (for personalized therapy in language development)

2. Natural Language Processing (NLP)

NLP allows for real-time speech and language analysis, benefiting both diagnostic and treatment stages. It enables more accurate fluency and articulation assessments, thus reducing the time needed for manual evaluations.

- **Strategies for Use:**
 - Use NLP tools to analyze speech samples and identify patterns in speech disorders.
 - Implement NLP in teletherapy to track real-time progress and fine-tune therapy plans.
- **Case Study:** An SLP used NLP to analyze articulation patterns in a child with apraxia, enabling timely adjustments to therapy sessions.

3. Augmentative and Alternative Communication (AAC) Devices

AAC devices are continuing to evolve with the integration of AI and cloud connectivity, providing non-verbal children more ways to communicate. Devices like **Proloquo2Go** and **Tobii Dynavox** offer voice output, symbol-based communication, and real-time language assistance.

- **Tips for Immediate Use:**
 - Customize AAC devices to align with individual therapy goals and communication needs.
 - Use cloud-based AAC systems to track communication patterns over time and adjust accordingly.
- **Future Trends:**
 - AI-driven predictive speech output to enhance communication flow for non-verbal users.
 - More lifelike speech synthesis for AAC devices to create more natural-sounding communication.

4. Virtual Reality (VR) and Augmented Reality (AR)

VR and AR offer immersive experiences for speech therapy and aural rehabilitation. They simulate real-life scenarios where children can practice communication skills in controlled, safe environments.

- **Practical Tips:**
 - Use VR environments to simulate noisy classrooms or social gatherings to improve a child's auditory processing and conversational skills.
 - Implement AR tools in therapy sessions to offer interactive language and listening exercises.
- **Tools to Try:**
 - **QuiverVision** (AR coloring pages for language activities)
 - **Magic Earth Turn-by-Turn** (for navigating real-world auditory environments)

5. 3D Printing in Audiology

3D printing has revolutionized the creation of custom hearing aids and cochlear implant components. Audiologists can now design ear molds and other personalized devices more accurately and quickly.

- **Strategies:**
 - Use 3D printing to create individualized hearing aid molds for enhanced comfort and performance.
 - For children with specific anatomical needs, 3D printing provides tailored solutions for cochlear implants or BAHA devices.
- **Case Study:** A clinic used 3D printing to create personalized ear molds for children with craniofacial differences, drastically improving comfort and fit.

6. Teleaudiology and Telepractice

Telepractice expands access to both speech therapy and audiology services, allowing remote sessions for patients in underserved areas. It leverages video conferencing and cloud-based platforms for real-time assessments and follow-ups.

- **Practical Implementation:**
 - Use telepractice to provide remote hearing aid adjustments, saving patients travel time.
 - For SLPs, conduct therapy sessions through telehealth platforms with real-time feedback and progress tracking tools.
- **Tools to Consider:**
 - **Resound Assist** (for hearing aid adjustments)
 - **Zoom or Doxy.me** (for teletherapy)

Future Trends in Hearing Technology and Aural Rehabilitation

1. Brain-Computer Interfaces (BCIs)

BCIs are being developed to help non-verbal individuals control AAC devices with thought alone. This disruptive technology has the potential to change how those with severe communication disabilities interact with the world.

- **Future Tip:**
 - Stay informed about BCI research as it develops, particularly for non-verbal individuals or those with locked-in syndrome.
- **Case Study:** A young child with cerebral palsy was able to operate a communication device using BCI, allowing for more independence in daily communication.

2. Nanotechnology in Hearing Devices

Nanotechnology is making hearing devices more durable, efficient, and capable of self-cleaning. Future nanotech may create entirely implantable devices that eliminate the need for external hearing aids or processors.

- **Upcoming Uses:**
 - Look for waterproof, dustproof hearing aids that are more resilient in various environments.
 - Implantable devices could change the landscape of hearing technology, with no external parts required.

3. Predictive Analytics in Aural Habilitation

Predictive analytics will shape future audiology services by forecasting patient outcomes and suggesting personalized rehabilitation plans. Machine learning will analyze a user's data and automatically adjust their devices for optimal performance.

- **Future Application:**
 - Incorporate predictive analytics to customize aural habilitation and rehabilitation programs for better long-term outcomes.
- **Example:** Predictive analytics were used in aural rehabilitation to forecast the progress of a cochlear implant user, adjusting therapy sessions in real-time.

Ethical Considerations for Technology Integration

As new technologies disrupt traditional service models, clinicians must consider ethical implications, including:

- **Data Security:** Ensure that patient data collected through AI, telepractice, or AAC devices is encrypted and stored securely.
- **Accessibility:** Make sure technology is available and usable by all populations, particularly those with limited access to high-end devices.
- **Bias in AI:** Be aware of potential bias in AI algorithms and monitor their impact on decision-making processes in therapy.

Conclusion and Action Plan

As these disruptive technologies continue to shape the fields of speech-language pathology and audiology, clinicians must stay updated on advancements to deliver the best outcomes for their clients. Here's how you can apply the knowledge gained:

1. **Explore New Tools:** Start using AI-driven apps, VR/AR, and personalized AAC systems in your practice.
2. **Stay Informed:** Engage in continuing education courses on cutting-edge technologies.

3. **Collaborate:** Work with interprofessional teams, including IT specialists, to integrate new tech smoothly into your practice.
4. **Monitor Outcomes:** Regularly assess the effectiveness of new tools and adjust your strategies based on client progress.

For more information, explore these additional resources:

- www.oticon.com
 - www.cochlear.com
 - www.tobidynavox.com
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Hello, amazing speech-language pathologists and audiologists! Are you feeling overwhelmed, stuck, or just plain burned out? It's okay—you're not alone. The demands of our professions are real, and sometimes it feels like there's no light at the end of the tunnel. But what if I told you there *is* a way to rediscover your passion, conquer those limiting beliefs, and step into a more fulfilled, balanced life?

That's where Sunburst Coaching and Consulting comes in. Imagine hiring a personal trainer—but not for your body, for your life. Sunburst Coaching is your partner in tackling burnout, crushing negative mindsets, and moving beyond imposter syndrome. With proven strategies, personalized support, and an approach designed for speech-language pathologists and audiologists just like you, it's time to invest in yourself and transform your outlook.

No more feeling like you're just surviving day to day. With Sunburst Coaching, you can break free of the barriers holding you back and step into the life you deserve—a life that lights you up, just like the sun!

Ready to start your journey? Reach out to K. Todd Houston, Ph.D., at ktodd.houston@gmail.com today to schedule your free discovery call and see what's possible. Let's shine together!