

Speech, Language, and Literacy Intervention Considerations and Best Practices for Infants and Children with Down Syndrome

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Introduction

- Down syndrome (DS) is the most common genetic cause of intellectual disability (~1 in 700 live births) that is caused by an extra copy of chromosome 21.
- Individuals with DS often present with a specific phenotype that often hinders language development, speech intelligibility, and literacy skills. This includes:
 - Hearing and vision impairments
 - Poor muscle tone
 - Enlarged tongues
 - Intellectual disability
- Children experience more difficulty with expressive language when compared to expressive, with relative strengths in social skills, visual memory, and vocabulary knowledge.
- The cognitive-behavioral phenotype of DS should pose as a guide for selecting appropriate interventions.

Early Intervention (EI)

- EI is the process of identifying difficulties and providing services to young children and their families in order to lessen the effects of disability and delay.
- Benefits include:
 - Increased lifetime earnings
 - Decreased grade retention
 - Improved health outcomes that have the potential to lower future medical costs
- **Key Principles**
 - Services should be comprehensive, coordinated, and team-based. This includes services that are:
 - Family centered
 - Considerate and respectful of cultural and linguistic differences
 - Promote developmentally supportive services in the child's natural environment.
- **Intervention Strategies**
 - *Responsive strategies* aim to increase engagement and interaction, child-initiated interactions, and emphasize turn-taking. This includes narration of adult and child-directed play, imitation, expansion, and/or recasting of the child's utterances.
 - In *directive strategies*, the adult is responsible for directing language production in an attempt to elicit a desired response. This may include asking open-ended questions and selecting options from a field of two.

Parent-Implemented Therapy

- There are evidence-based programs available that train parents to become the primary intervention agents:
 - Enhanced milieu Teaching (EMT), Responsivity Training (RE), and the Hanen Program.
- Although outcomes vary based on the client and their family's motivation and dedication to treatment, parent-implemented therapies have the potential to increase positive outcomes increase parental responsiveness and have an overall positive effect on children's communication skills by creating more opportunities for growth outside of therapy sessions.
- Parent-implemented therapy can increase overall Interaction, receptive language skills, and certain aspects of expressive language such as vocabulary diversity, lexical density, and MLU.

Language Interventions

Expressive Language

- It is considered best practice to utilize their linguistic strengths to aid learning.
 - E.g.: Capitalize on their strengths in visual memory by using visually oriented pictures and books to enhance learning.
- Begin by establishing prelinguistic skills such as eye contact, joint attention, turn-taking skills, and imitation prior to moving up the language hierarchy.
- Following the establishment of prelinguistic skills, expressive language aim to increase the frequency and complexity of expressive output utilizing a total communication approach/ AAC.

Receptive Language

- Obtain prerequisite skills such as imitation, matching-to-sample, auditory discrimination, scanning, and pointing prior to receptive language intervention .
- After establishing prerequisite skills, select functional and appropriate goals based on the DS language phenotype and the child's current receptive language levels.

Speech Sound Interventions

- Children with DS's speech is described as being "atypical" and "unusual." Although the speech sound errors differ based on the individual, they are most often a combination of consonant and vowel errors.
- Current research suggests intervention should focus on increasing phonetic repertoire and reducing errors by using therapy techniques similar to those for children with phonological delay or disorder, while continuing to consider phenotypical strengths in DS (E.g.: Utilizing visual placement cues).
- It is also noted that in addition to targeting segmental aspects of speech (i.e. consonants and vowel sounds), incorporating suprasegmental targets (i.e. prosody, tone, word-juncture) has the potential to increase the naturalness of speech.

Literacy Interventions

- Research regarding literacy interventions strongly suggests targeting emerging literacy has the potential to positively impact:
 - Later literacy skills such as:
 - Letter-sound knowledge
 - Print concepts
 - Phoneme blending
 - Single word reading
 - Academic development
 - Expressive language
 - MLU
 - Vocabulary knowledge
 - Receptive language
 - Speech sound production.
- Best practices includes using a model of emergent literacy and implementing parent coaching. This includes:
 - Dialogic reading strategies
 - Limit the text to fit the child's receptive language levels, make connections to background knowledge, ask questions, make comments, utilize facial expressions and prosody to imitate the characters in the story, and pointing.
 - Print referencing
 - Point to the text while reading the words aloud to help children create a connection between spoken and written words
 - Book-handling strategies
 - Implementing phonemic awareness tasks.

Conclusion

- This review serves as a guide to selecting appropriate evidence-based language, speech, and literacy intervention methods and strategies specifically tailored to infants and children with DS.
- These considerations may provide insight to alter current interventions, maximize client growth, and inform practice.