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# Prologue to the Forum: Care of the Whole Child: Key Considerations When Working With Children With Childhood Apraxia of Speech

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# Prologue to the Forum: Care of the Whole Child: Key Considerations When Working with Children with Childhood Apraxia of Speech

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## Abstract

### Purpose:

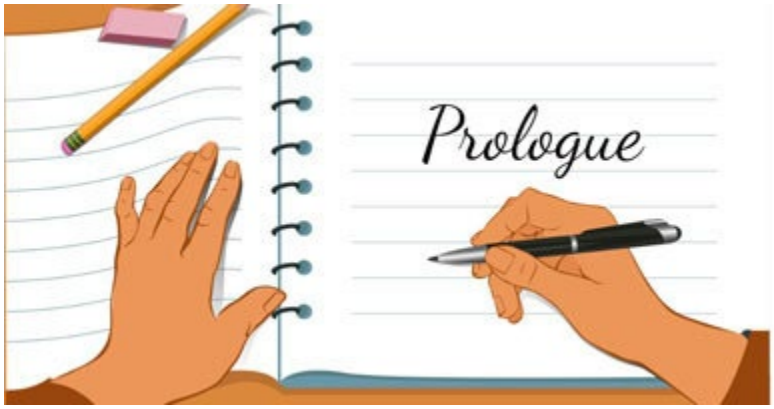
This prologue introduces the *LSHSS* Forum: Care of the Whole Child: Key Considerations When Working With Children With Childhood Apraxia of Speech. The goals of the forum are to provide (a) an overview of several co-occurring conditions and challenges that may affect children in this population and (b) methods and materials to enhance diagnostic accuracy and treatment efficacy to help children with childhood apraxia of speech (CAS) to thrive.

## Method:

The prologue provides an overview of what it means to care for the whole child and introduces the five articles in the forum, including research and clinical focus articles as well as tutorials. Infographics, assessment templates, video examples, case studies, and treatment goals are included throughout the forum to promote translation from research to practice.

## Conclusion:

Children with CAS may experience a breadth of skills, challenges, and diagnoses. By learning (a) to identify possible co-occurring conditions, (b) when to make referrals, and (c) how to best accommodate and treat children when different conditions are present, speech-language pathologists can further increase the quality of care provided and ability to advocate for some of our most vulnerable clients and their families.




*Childhood apraxia of speech* (CAS) is described as a disorder of motor programming and planning that affects the sequencing, direction, timing, and degree of the articulatory movements used to produce speech sounds (**American Speech-Language-Hearing Association [ASHA], 2007**; **Iuzzini-Seigel, Allison, & Stoeckel, 2022**). These deficits result in the constellation of speech features that are commonly associated with CAS including various segmental errors, difficulty with coarticulatory transitions, prosodic disturbance, and inconsistency of speech sounds (**Allison et al., 2020**; **ASHA, 2007**; **Iuzzini-Seigel et al., 2015**, **2017**; **Iuzzini-Seigel, Allison, & Stoeckel, 2022**; **Murray et al., 2021**; **Shriberg et al., 2017**; **Terband et al., 2019**). Although CAS is a speech disorder, previous research suggests that it rarely occurs on its own (**Duchow et al., 2019**; **Iuzzini-Seigel, 2019**, **2021**; **Lewis et al., 2004**; **Zuk et al., 2018**). In fact, the extant literature reflects mounting evidence that between 50%–80% of children with CAS demonstrate developmental language disorder and/or challenges in speech perception, literacy, fine/gross motor, and social–emotional domains (**Bradford-Heit & Dodd, 1998**; **Duchow et al., 2019**; **Iuzzini-Seigel, 2019**, **2021**; **Iuzzini-Seigel, Moorer, & Tamplain, 2022**; **Lewis et al., 2004**; **McNeill et al., 2009**; **Miller et al., 2019**; **Moriarty & Gillon, 2006**; **Zuk et al., 2018**). The extent of other comorbid diagnoses among children with CAS, such as autism, may be less clear due to differences in inclusionary criteria across the limited studies that exist (**Beiting & Maas, 2021**; **Chenausky et al., 2019**; **Shriberg et al., 2011**; **Tierney et al., 2015**). Any of these other conditions or diagnoses can have a significant impact on academic, vocational, and social–emotional outcomes on their own (**Bird et al., 1995**; **Cassar et al., 2022**; **Felsenfeld et al., 1994**; **Rice et al., 1991**) and children with co-occurring

deficits unfortunately may have even greater difficulties by comparison to those who have isolated challenges (e.g., **Flapper & Schoemaker, 2013**).

Ultimately, we know that CAS does not occur in a vacuum, and a child's (and their family's) challenges will likely be greater if having to manage multiple deficits. When a child has multiple diagnoses, it is not "just" that they have an extra diagnostic label listed in their chart or individualized education program. An added diagnosis can also mean more daily challenges and considerations for the child and family as they work together to accomplish activities of daily living, schoolwork, and extracurricular activities that other same-aged peers perform with greater independence. More diagnoses may mean that more time, money, and mental energy are spent getting a child much-needed therapy and support. More diagnoses can mean greater risk for long-term academic, physical, and mental health challenges. Taken together, more challenges and diagnoses can mean additional considerations are needed to attend to and provide care for the whole child.

To effectively address the varied challenges faced by children with CAS, clinicians need to know what areas to look for and how to effectively evaluate and address those challenges, whether directly through their own practice or through appropriate referrals. Each article in this forum moves us toward this goal by providing a summary of the extant research on the most common conditions that co-occur with CAS and providing practical clinical assessment and treatment tools and strategies to optimize our care of the whole child. Case study illustrations, video examples, checklists, infographics, and step-by-step instructions are included to help support you in implementing the evidence right away.

To begin, you will find a tutorial that centers on differentiating CAS and pediatric dysarthria (**Iuzzini-Seigel, Allison, & Stoeckel, 2022**). While the past decade has brought increased clarity on the differential diagnosis of CAS and phonological disorder, there is less transparent information available on how to best differentiate CAS and dysarthria in children. Iuzzini-Seigel, Allison, and Stoeckel conducted a web-based survey of 359 clinicians to investigate clinician confidence in diagnosing motor speech disorders in children. Results showed that 60% of clinician respondents reported low or no confidence in diagnosing dysarthria in children, which inspired a new clinical tool, the ProCAD (Profile of CAS and Dysarthria). In their tutorial, Iuzzini-Seigel, Allison, and Stoeckel present a background on CAS and dysarthria; results of their survey; step-by-step instructions for using the ProCAD; and various assessment templates, video examples, and case studies to promote clinical application of this free tool. Case studies walk the reader through the diagnostic process and then provide treatment considerations as well. The goal of this tutorial is to provide clinicians with a tool that can be immediately used in the real world to systematically evaluate the speech subsystems and interpret how the child's profile of speech features maps on to a particular diagnosis (or co-occurring diagnoses).

Second, we include a tutorial that offers practical, evidence-based recommendations to guide speech assessment and services for autistic children with CAS and particularly for those with limited verbal ability (**Beiting, 2022**). Beiting starts with a thorough review of the literature on assessment and treatment of speech sound disorders in autistic children and discusses how some features, such as atypical prosody, overlap populations and can be demonstrated by autistic children as well as those with CAS. Beiting describes important points to consider when supporting autistic children with CAS, such as how sensory differences may interfere with the oral mechanism exam and make tactile cues unwelcome or how avoidance or other challenging behaviors could be exacerbated during assessment

tasks if the child becomes frustrated. Beiting offers suggestions for what to include in assessments and how to organize the sessions to optimize the child's level of arousal and thereby improve the likelihood that the child will feel comfortable participating in the evaluation. For instance, ensuring the child has unrestricted access to augmentative and alternative communication allows a child to self-advocate, and incorporating physical activity before and throughout the session can help to increase behavioral regulation.

Third, you will find a tutorial by **Spencer et al. (2022)** on speech perception in children with CAS. This article is helpful in summarizing the equivocal research on speech perception as an area of potential difficulty for children with CAS and providing guidance on the best methods to assess speech perception for children in this population. Spencer et al. discuss the benefits and limitations of different evaluation tasks and help to distill why some tasks may not be sensitive enough to detect speech perception challenges in children who do in fact have difficulty in this area. For instance, a "goodness judgment" task, in which a listener indicates whether or not a talker has produced a "good" example of a target sound (**Rvachew et al., 1999**, **2004**; **Shuster, 1998**; **Wolfe et al., 2003**), is considered superior to "same/different" tasks, in which a listener judges whether two words or sounds are the same or different (**Locke, 1980**). Previous research showed that children with CAS who have co-occurring developmental language disorder had speech perception challenges while those with typically developing language did not (**Zuk et al., 2018**). Understandably, speech skills are the most common focus of therapy for children with CAS and, consequently, speech perception and language treatment may occur less often than is needed (**Gomez et al., 2022**). Spencer et al. discuss various ways to explicitly target speech perception and language in children with CAS and provide case illustrations to show potential cascading differences in intervention responsiveness for children who differ in speech perception ability. Because speech perception and language skills underlie literacy, it is essential that we are evaluating these skills and addressing them as needed to help children with CAS thrive in academic and other environments.

Next, **Miller and Lewis (2022)** report on the decoding and literacy skills of children with suspected CAS as compared to children with reading difficulties and no speech sound diagnosis. This research article (a) provides a literature review on the skills that underlie reading abilities in children with CAS; (b) reports empirical results on literacy skills and those that underlie literacy such as phonological processing, language, speech perception in noise, and more; and finally, (c) discusses clinical implications of these findings. Key takeaways include that children with suspected CAS demonstrated an increased rate of literacy deficits similar to that of children with reading deficits without speech sound disorder; the rate of literacy deficits among children with suspected CAS was further elevated when language disorder was present. Findings add to the literature on reading difficulties in children with CAS (**Miller et al., 2019**; **Stein et al., 2020**). Miller and Lewis suggest that language and preliteracy skills are assessed as early as possible for children with CAS and use tasks like the Phonological Awareness Test (**Bird et al., 1995**) or Memory for Digits (Comprehensive Test of Phonological Processing–Second Edition; **Wagner et al., 2013**) that require minimal or no speech when assessing children who are unintelligible.

Finally, **Iuzzini-Seigel, Moorer, and Tamplain (2022)** report on developmental coordination disorder (DCD) in children with CAS. This clinical focus article begins with a background on DCD, which is

thought to affect at least 50% of children with CAS compared to 5% of the general population. Iuzzini-Seigel, Moorer, and Tamplain describe (a) symptoms of DCD, (b) the diagnostic criteria and procedure to make a DCD diagnosis, (c) how DCD affects daily functioning and limits access to the curriculum, and (d) why it is essential to make a referral when you suspect motor deficits in a child with CAS (or other communication impairment). Iuzzini-Seigel, Moorer, and Tamplain also report results from a small study investigating DCD in children with CAS. In addition to the obvious challenges that a child with motor difficulties might have (e.g., being clumsy, difficulty writing quickly and neatly enough to be successful note takers), individuals with poor motor abilities are also known to exercise less and are more prone to long-term physical and mental health issues as well (**American College of Sports Medicine, 2020**; **Caçola & Killian, 2018**; **Hendrix et al., 2014**; **Li et al., 2018**; **Missiuna et al., 2008**; **Zhu et al., 2014**). Taken together, it is essential to assess motor skills in children with CAS as part of caring for the whole child. An infographic is included in the supplemental materials of this article, which can be printed and displayed to help identify children at risk so they can be referred to colleagues for standardized motor assessments.

## Conclusion

In summary, children with CAS often have various co-occurring challenges and diagnoses. As speech-language pathologists, we can greatly improve care by making accurate differential diagnoses, extending referrals when indicated, and considering care of the whole child when planning intervention. Because the various challenges discussed in this forum can also be associated with poor academic, vocational, health, and social–emotional outcomes, it is essential that we are supporting early identification of these co-occurring challenges so that intervention can be optimized for each individual we work with. We hope this forum will raise awareness and provide evidence to support comprehensive service delivery so children with CAS can thrive. Thank you for spending some of your limited time reading this forum; we hope it will be of service to you.

Author Notes

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