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DISCLOSURES

- **Financial Disclosure:** Jennie is the owner of Bjorem Speech Publications and receives pay from sales from her products on her website, TPT and Boom Learning. Jennie is the owner of Children's Therapy Services and case studies were conducted at her place of business.
- TAASLP provided my fee for this presentation.

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LEARNING OBJECTIVES

- After completing this class, participants will be able to identify the characteristics of CAS that separate the diagnosis from other speech sound disorders.
- Participants will be able to define childhood apraxia of speech.
- Participants will become familiar with differential diagnostic criteria for CAS and learn how to informally assess.

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DEFINE APRAXIA

Apraxia of speech is a **SPEECH LABEL** for difficulty with planning and programming movement for speech. Our brains plan and program the movements needed for speech including the tongue, lips, jaw, palate, vocal cords, and diaphragm. Our brains also must judge when to move, at what speed, in what direction and distance for the movement, with how much muscle contraction... all at the same time. CAS is when there is a disconnect in the ability to plan out and program these movements, impacting movement for speech production and prosody.

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CAUSES OF CAS

Complex Neuro developmental disorders – Secondary characteristics of other disorders such as ASD, Down syndrome or genetic differences.

Neurological Impairment due to infection, illness or injury

Idiopathic Speech Disorders – unknown origin

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PREVALENCE


- It is estimated that CAS occurs in 1 to 2 children per 1,000 (0.1%–0.2%); (Shriberg et al., 1997).
- Boys have a higher incidence than in girls, with a 2–3:1 ratio (Hall, Jordan, & Robin, 1993; Lewis et al., 2004).
- Children with CAS are more likely to have accompanying language, reading, and/or spelling disorders (Lewis et al., 2004; Lewis & Ekelman, 2007).

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APRAXIA

(Characteristics)

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DISCRIMINATIVE	NON-DISCRIMINATIVE
 <p>Errors that are discriminative to CAS. These errors are more likely observed in CAS and less likely observed in other speech sound disorders.</p>	<p>Errors that are may be observed in CAS but are also frequently observed in other speech sound disorders.</p>

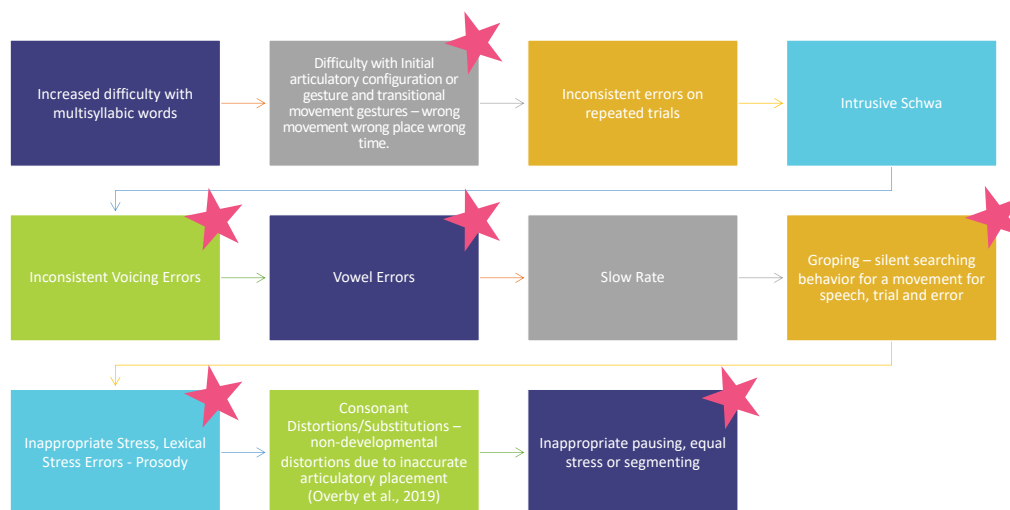
vs.

Appraising Apraxia by Dr. Edythe Strand, (March, 2017) The ASHA Leader, Volume 22, Issue 3
<https://leader.pubs.asha.org/doi/10.1044/leader.FTR2.22032017.50>

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Key Characteristics according to the Mayo 10 +1

(ASHA, 2007; Davis, Jacks & Marquardt, 2005; Iuzzuni-Siegel et al, 2015; Shriberg and Strand, 2014)



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CAS CHARACTERISTICS

Identification Practice



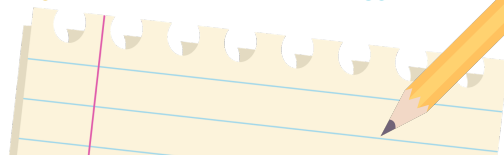
GO TO PAGE 1 IN YOUR
SUPPLEMENTAL PACKET



WATCH AND LISTEN TO CLIENT
VIDEOS




MARK ALL THE
CHARACTERISTICS YOU OBSERVE



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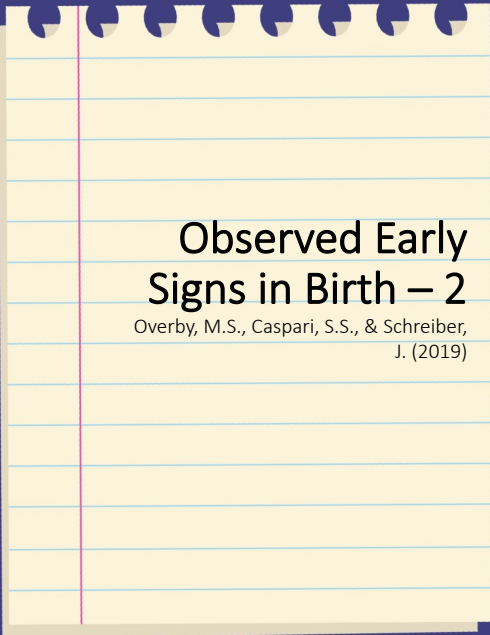
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**Early Characteristics
Reported Red Flags
for CAS in Early
Speech Development**
(Davis & Velleman, 2000; Highman,
Leitao, Hennessy, & Piek, 2012;
Maassen 2002.)

- Decreased, lack of babbling
- Groping, lack of flexibility when imitating speech
- Delayed onset of first words – beyond 12 months
- Limited Intonation
- GHOST WORDS – Words Appear and disappear
- Simple Syllable Shapes and Vowel Errors
- Difficulty attaining and maintaining articulatory postures

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Observed Early Signs in Birth – 2

Overby, M.S., Caspari, S.S., & Schreiber, J. (2019)

- First Consonant after 12 months
- 3 or fewer consonants by 16 months
- 5 or fewer consonants between 17-24 months
- Lack of velars or posterior sounds in first 24 months
- Dependency on bilabials, alveolars, stops, and nasals in first 24 months
- Limited syllable structure

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APRAXIA
Assessment & Diagnosis

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WHO CAN DIAGNOSIS APRAXIA?



ACCORDING TO THE ASHA POSITION STATEMENT, SPEECH-LANGUAGE PATHOLOGISTS **TRAINED** IN DIAGNOSIS OF APRAXIA OF SPEECH ARE THE PROFESSIONALS RESPONSIBLE FOR MAKING THE PRIMARY DIAGNOSIS OF CAS.

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DIFFERENTIAL DIAGNOSIS Checklist

- ☐ CASE History and Family Interview
- ☐ Retrospective Video Analysis – help identify early characteristics
- ☐ Oral Motor Speech Exam
- ☐ Sound Inventory
- ☐ Motor Speech Exam
- ☐ Word Lists – Well Rehearsed & Power



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ORAL MOTOR EXAM

& NON-SPEECH oral Motor EXAM

Children with non-speech oral apraxia are more likely to have apraxia of speech, however it is not required to give a diagnosis of CAS. We do a NSOME because it provides us with more information regarding oral apraxia and can help us rule out dysarthria and help complete the puzzle of diagnosing CAS.

(ue-TIP

AMY graham has a WONderFul oral MoTOR eXAM!



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SOUND INVENTORY



- **Sound & Syllable:** take an inventory of sounds and syllables child is able to say spontaneously as well as elicited
- **Well Rehearsed & Power Words:** make a list of words the child has in their repertoire as well as words that are powerful.
 - Well Rehearsed Words – words child already has
 - Power Word- words that are important for the child to learn (interview the family)

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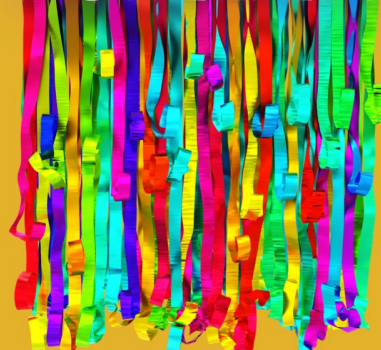
MOTOR SPEECH EXAM

What's The difference?

STATIC



DYNAMIC



(Strand et al., 2013; Strand & McCauley, 2019).

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DEMSS

DYNaMIC eValuation OF
MoTOr SPEeCh skill

- Standardized, criterion-referenced assessment for ages 3 and up or severely speech impaired, even children considered minimally or non-verbal.
- Focus – movements for speech
- Guide the clinician in observations of speech characteristics
- Help with judgments of severity and prognosis
- Tool for facilitating treatment planning and target selection
- Overall articulatory accuracy, vowel accuracy, prosodic accuracy and consistency are scored.

Dr. EdYThe sTraNd

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DIY.... I DID!



- You can use for children ages 2 and up as a working document!
- Focus – movements for speech
- Assess targets that vary in length and phonetic complexity that are organized in a syllabic hierarchy.
- Assessment is done in imitation of the administrator
- Characteristics of CAS are observed over 3 speech probes
- Assess dynamically to get more information on how the child learns and improves accuracy through cueing.

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DEFINITIONS

For The iNFormal assessment

- **Speech Probe:** the task that assesses the child's skill - articulation test, speech sample, Challenging Word Task, Park Play Scene, syllable hierarchy, 1-Syllable, 2-syllable, multisyllabic
- **Sign/Characteristic:** a sign is a feature of CAS and is only counted as a sign when it is seen at least twice within a speech task.
- **CUES:** note cues used to help the child with accurate productions – our goal during assessment is to get a correct production.

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SCORING

Score vowel on the 1st production – correct or incorrect

Must see a characteristic 2 times in order to count it as a sign within a speech task. *e.g., you should see “groping” 2 times when assessing CV in order to check it as a sign.*

For a CAS+ you should be able to observe 4 of the same characteristics over a minimum of 3 speech tasks. *e.g., you should see “groping”, “inconsistent errors on repeated trials”, “vowel distortions” and “segmenting” consistently in an articulation test, speech sample, and multisyllabic words.*

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DEFINITIONS

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Childhood Apraxia of Speech		Apraxia of speech is a speech label for difficulty with planning and programming movement for speech. Our brains plan and program the movements needed for speech including the tongue, lips, jaw, palate, vocal cords, and diaphragm. Our brains also must judge when to move, at what speed, in what direction, the distance for the movement, with how much muscle contraction... all at the same time. CAS is when there is a disconnect in the ability to plan out and program these movements impacting the movement for speech production and prosody. -Jen Bjorem
Segmenting	S	Inappropriate pausing between sounds or syllables - robot sounding
Voicing Errors	V	Child uses voiced consonants in place of voiceless or vice versa - e.g., do for two
Vowel Distortion or Substitution	VD	Slight or significant differences in vowel production, something sounds wrong ... listen closely it takes a trained ear
Groping	G	Silent searching behavior for a movement for speech
Intrusive Schwa	IS	Inappropriate addition of schwa e.g., gulue (glue), nouh (no), bedu (bed), epenthesis
Inconsistent Errors	IE	Noted differences in production on repeated trials e.g., beby, baby, debi, beddi
Difficulty with initial articulatory configuration and transitional movement gestures	TG	Lengthened or disrupted movements between sounds and syllables, wrong movement wrong place wrong time, difficulty establishing initial articulatory gesture
Equal or inappropriate stress or prosody errors	P	e.g., money (no stress) vs. MOney OR MOney vs. moNEY (wrong stress), Limited vocal range, difficulty with volume, may sound monotone
Slow Speech	SS	Slow rate of speech
Increased Errors in Multisyllabic words	M	Increased errors on multisyllabic words
Consonant Distortions	C	Non-developmental distortions due to inaccurate articulatory placement (Overby et al., 2019)

Overby, M.S., Caspari, S.S., & Schreiber, J. (2019). Volubility, consonant emergence, and syllabic structure in infants and toddlers later diagnosed with childhood apraxia of speech, speech sound disorder, and typical development: A retrospective video analysis. *Journal of Speech, Language, and Hearing Research*. doi: 10.1044/2019_JSLHR-S-18-0046.

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