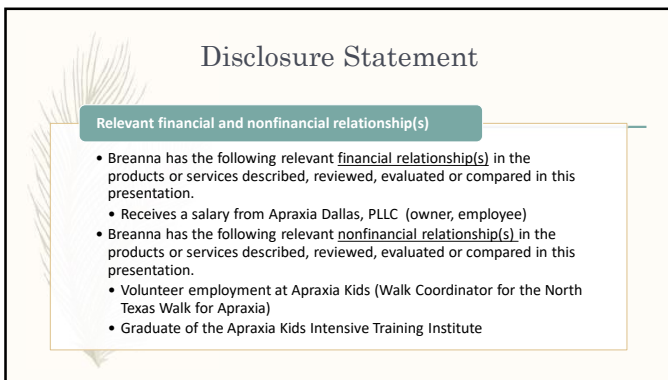





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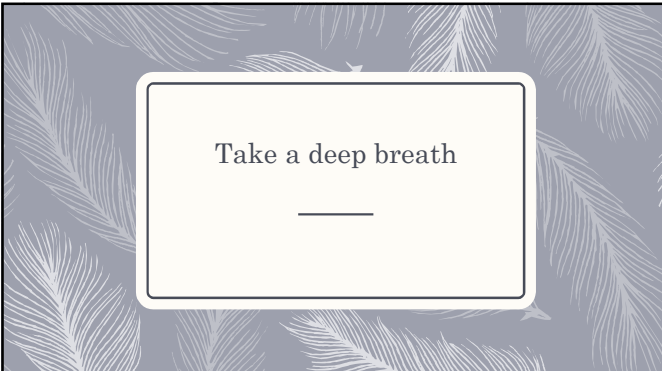
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Overview

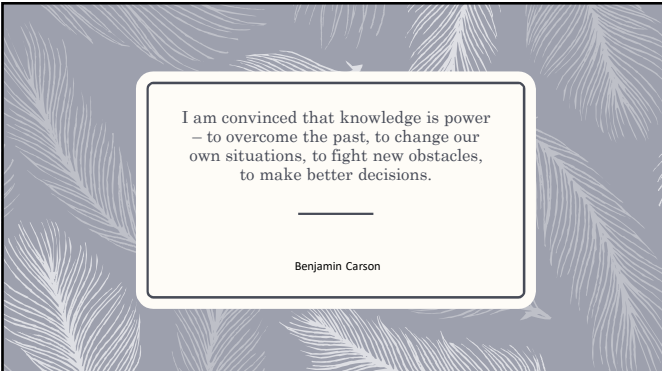
- CAS and its characteristics
- Co-occurring challenges
 - Communication – language, speech, fluency
 - Learning – reading and math
 - Sensory-motor – developmental coordination disorder, sensory differences
 - Social-emotional – social-pragmatic, anxiety
 - Neurodevelopmental – ADHD, executive functioning, autism
 - Genetic syndromes and conditions

4



Take a deep breath

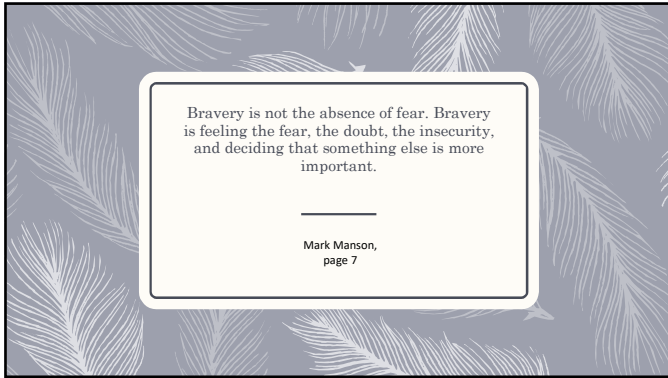
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I am convinced that knowledge is power
– to overcome the past, to change our
own situations, to fight new obstacles,
to make better decisions.

Benjamin Carson

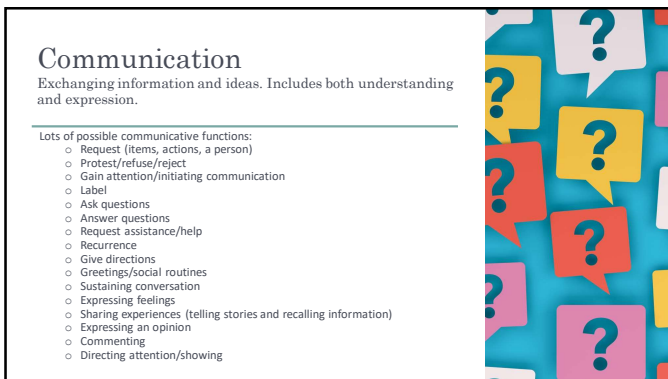
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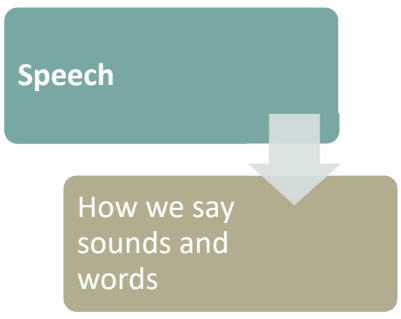


Language
Comprehension and/or use of a spoken, written and/or other communication symbol system. Includes receptive and expressive.

Composed of 5 domains:

- Phonology
- Morphology
- Syntax
- Semantics
- Pragmatics

10



Speech

How we say sounds and words


11



Speech Sound Disorders

“any combination of difficulties with perception, motor production, and/or the phonological representation of speech sounds and speech segments (including phonotactic rules that govern syllable shape, structure, and stress, as well as prosody) that impact speech intelligibility” (<http://www.asha.org/Practice-Portal/Clinical-Topics/Articulation-and-Phonology/>)


12



Childhood Apraxia of Speech (CAS)

"A neurological childhood (pediatric) speech sound disorder in which the precision and consistency of movements underlying speech are impaired in the absence of neuromuscular deficits (e.g., abnormal reflexes, abnormal tone). CAS may occur as a result of known neurological impairment, in association with complex neurobehavioral disorders of known or unknown origin, or as an idiopathic neurogenic speech sound disorder. The core impairment in planning and/or programming spatiotemporal parameters of movement sequences results in errors in speech sound production and prosody" (ASHA, 2007, emphasis added)

13




Childhood Apraxia of Speech (CAS)

CAS is a label used for a specific type of speech sound disorder in which the planning and/or programming of the movements to produce speech is inefficient. This results in a variety of speech characteristics.

Strand, 2016

14



Dysarthria

- Also a motor-based speech sound disorder
- CAS is a deficit in the *planning and/or programming* for movement whereas dysarthria is a deficit in *execution* of movement
 - Muscles often impaired in dysarthria
- Weakness, decreased range of motion and force of movement
- Treatment based on the principles of motor learning

15

Diagnosis determines treatment

If a child has a motor speech disorder (CAS or dysarthria or a mixed motor speech disorder), therapy should be based on the principles of motor learning.

16

Other Communication Challenges

17

Language Disorders

A language disorder is impaired comprehension and/or use of spoken, written and/or other symbol systems. The disorder may involve (1) the form of language (phonology, morphology, syntax), (2) the content of language (semantics), and/or (3) the function of language in communication (pragmatics) in any combination.

([https://www.asha.org/policy/ips1993-00208/#:~:text=A%20language%20disorder%20is%20impaired,\(pragmatics\)%20in%20any%20combination](https://www.asha.org/policy/ips1993-00208/#:~:text=A%20language%20disorder%20is%20impaired,(pragmatics)%20in%20any%20combination))

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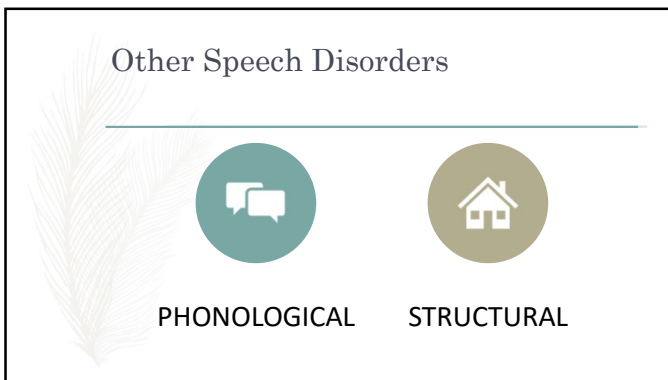


Language Disorder Treatment



Language therapy provided by a speech-language pathologist (SLP)

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19



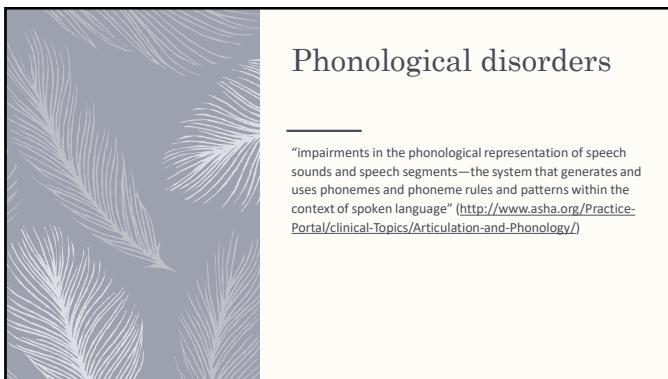
Other Speech Disorders

PHONOLOGICAL STRUCTURAL

This slide features a decorative background of a feather on the left side and two circular icons: one with two speech bubbles and one with a house.

20




Phonological disorders

"impairments in the phonological representation of speech sounds and speech segments—the system that generates and uses phonemes and phoneme rules and patterns within the context of spoken language" (<http://www.asha.org/Practice-Portal/Clinical-Topics/Articulation-and-Phonology/>)

This slide features a decorative background of several feathers on the left side.

21



Phonological Disorders

- Phonological patterns are patterns in children's speech used to make talking easier.
- If these persist beyond the typical developmental range or are considered atypical patterns, a child is diagnosed with a phonological disorder.


22



Phonological Disorder Treatment

- Speech therapy by a speech-language pathologist BUT
- Keep motor planning in mind
- Often need to modify cycles approach

23




Structural

- Cleft lip and/or palate
 - Submucosal cleft
 - Velopharyngeal Insufficiency (VPI)
- Tethered oral tissues

24

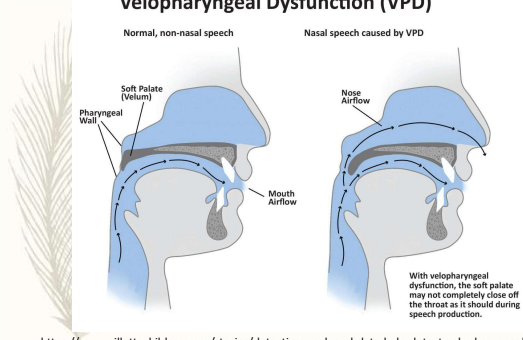
Cleft lip and palate



- Clefts typically identified at birth and referred to craniofacial team
- Submucosal cleft may not be identified until later
- Velopharyngeal insufficiency (VPI)
 - Soft palate/velum does not make adequate contact with back of throat (posterior pharyngeal wall)
- Signs
 - Nasality issues (*hypernasal, air emission*)
 - Difficulty feeding
 - Chronic ear infections
 - Speech errors

25

Velopharyngeal Dysfunction (VPD)



Normal, non-nasal speech


Nasal speech caused by VPD

With velopharyngeal dysfunction, the soft palate may not completely close off the throat as it should during speech production.

<https://www.gillettechildrens.org/stories/detective-work-and-data-help-detect-velopharyngeal-dysfunction-vpd>


26

Cleft lip/palate/VPI treatment



- Assessment by craniofacial team
 - SLP
 - Surgeon
 - Possibly ENT and others
 - May include nasopharyngoscopy or videofluoroscopy
 - Teams often found at children's hospitals
- Therapy from SLP with knowledge and experience in this area
- Surgery to repair cleft lip/palate
- Possibly procedure for submucosal cleft and/or VPI
- Often speech therapy post surgery/procedure

27




Tethered oral tissues

Includes tongue tie, lip tie, buccal ties

Tongue tie may impact speech but is not the reason a child is not talking

28



Tongue Tie

- Also called ankyloglossia
- Frenulum – tissue connecting the underside of the tongue to the floor of the mouth
- Tongue-tie – tight or short frenulum, causing impaired mobility of the tongue
 - 5 sub-types
 - Can't be diagnosed just by looking – should be based on FUNCTION


29



Signs of Tongue Tie

- Infants
 - Difficulty breast feeding
 - nipple pain or damage for the mother
 - slow weight gain
 - clicking or noisy feeding
 - baby feeding all of the time (asking to eat right after eating or not seeming to be full)
 - decreasing milk supply for mother despite regular feedings
 - Tongue down (not elevated) when crying
 - Difficulty transitioning to baby foods or textured foods that require chewing
 - Fussy baby – lots of gas, spit-up and/or gastrointestinal discomfort
 - May be diagnosed with GERD but acid reducing medication doesn't help

30



Signs of Tongue Tie

- Older Children
- Picky (beyond age 3) or resistant eaters
- Loud sleepers/snore
- Tired/fatigue
- Attention issues
- Difficulty elevating tongue
- Difficulty producing sounds on the alveolar ridge (/t, d, n, l, s, z, j, tj, ʒ, dʒ/)
- Difficulty lateralizing tongue (may affect chewing)


31



Treatment for Tongue Tie

- Orofacial myofunctional therapy by SLP with knowledge/training/experience or other professional with orofacial myofunctional certification
- Possible procedure to release tissue to increase mobility by frenectomy (scissors) or frenotomy (laser, scalpel)
 - Conducted by pediatric dentist, ENT or pediatrician
- Follow up exercises for wound care and to increase mobility

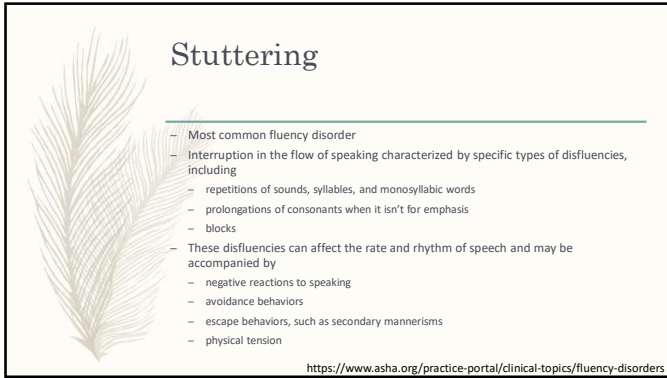
32



Fluency

- Fluency refers to continuity, smoothness, rate, and effort in speech production.
 - Motor planning!
- All speakers are dysfluent at times
 - Pauses, fillers (uh, like), repetitions
- Preschool children often go through periods of developmental dysfluency

33



Stuttering

- Most common fluency disorder
- Interruption in the flow of speaking characterized by specific types of disfluencies, including
 - repetitions of sounds, syllables, and monosyllabic words
 - prolongations of consonants when it isn't for emphasis
 - blocks
- These disfluencies can affect the rate and rhythm of speech and may be accompanied by
 - negative reactions to speaking
 - avoidance behaviors
 - escape behaviors, such as secondary mannerisms
 - physical tension

<https://www.asha.org/practice-portal/clinical-topics/fluency-disorders>

34



Stuttering Treatment


- Treatment approach will depend on child's age and other challenges but may be a very different focus than therapy for apraxia
- Speech-language pathologist (SLP) with knowledge and experience
- Board Certified Specialists in Fluency - <https://www.stutteringspecialists.org/>

35



Learning Differences


36



Reading Disorders

- Considered a language disorder
- Reading/writing are written language
- Includes dyslexia
- Children with speech and language disorders, including children with CAS, are at increased risk of reading disorders

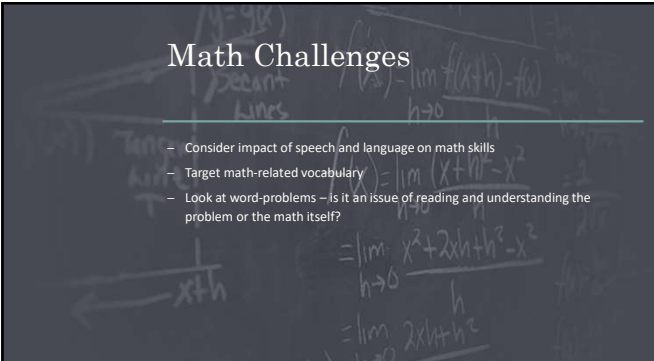
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Reading Disorder Treatment

- Be proactive – talk with SLP about including pre-reading skills such as phonological awareness in therapy starting in pre-school
- Screeners for dyslexia at end of kindergarten and first grade
- Look for structured literacy approaches, but modify/individualize to your child
 - www.thereadingleague.org
 - www.readingrockets.org
 - aacliteracy.psu.edu
- Reading/dyslexia specialists
- Team effort – have SLP(s), reading/dyslexia specialist, teacher and family on the same page

38



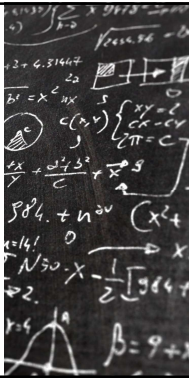
Math Challenges

- Consider impact of speech and language on math skills
- Target math-related vocabulary
- Look at word-problems – Is it an issue of reading and understanding the problem or the math itself?

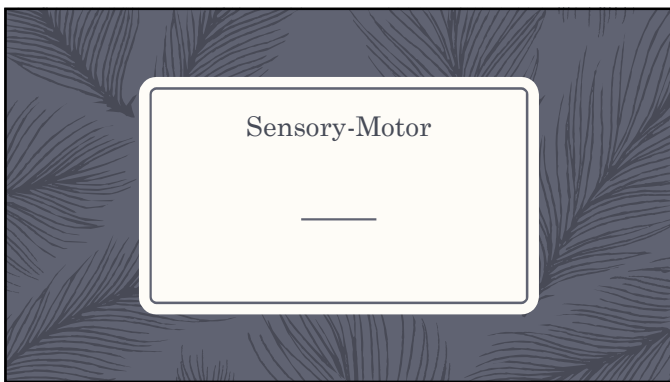
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Strategies for Math Challenges

- Teach math-related vocabulary
- Add visuals and then fade to visualization

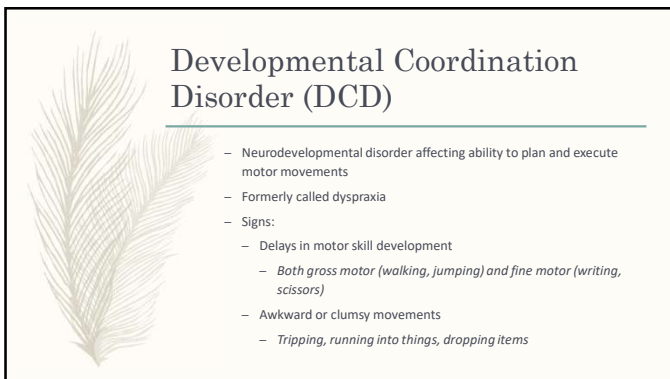


40



Sensory-Motor


41



Developmental Coordination Disorder (DCD)

- Neurodevelopmental disorder affecting ability to plan and execute motor movements
- Formerly called dyspraxia
- Signs:
 - Delays in motor skill development
 - Both gross motor (walking, jumping) and fine motor (writing, scissors)
 - Awkward or clumsy movements
 - Tripping, running into things, dropping items


42



Treatment for DCD

- Diagnosed by a neurologist
- Occupational and/or physical therapy, depending on needs


43



Sensory differences

- Sensory processing disorder
 - Formerly sensory integration disorder
- Brain has trouble receiving and responding to information that comes in through the senses
 - May under respond (hyposensitive) or overrespond (hypersensitive)
 - May have different levels of response, depending on the sense
- Signs:
 - Sensitivity to noises, bright lights
 - Seeks more input – crashing into walls, furniture
 - Differences in response to pain
 - Feeding issues

44



Treatment for Sensory Differences

- Diagnosed and treated by occupational therapist (OT)
- Therapeutic activities to help child attain "ready learning state"
 - *Might be crucial to engage in other activities, like speech therapy and school*
- OT may also design a "sensory diet" to implement at home/throughout the day
- Families and other professionals can help implement plans created by OT
- Diagnosis may not be recognized by physicians or other medical professionals
- Not a qualifying diagnosis in most schools for services

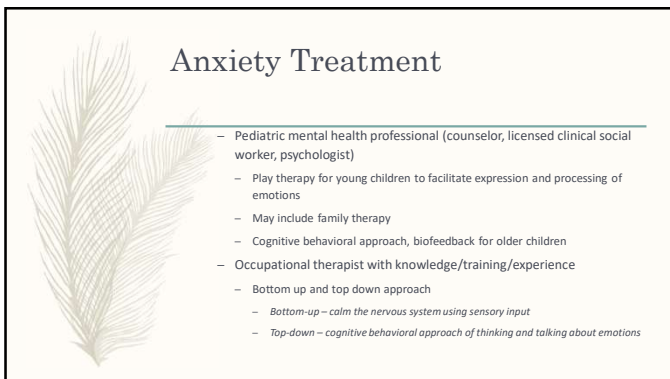
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46



47




48



Social-Pragmatic

- How language is used – the function
- Sometimes difficulties in this are due to challenges with perspective taking
- Also sometimes seems to be developmental delay/mismatch with other communication skills

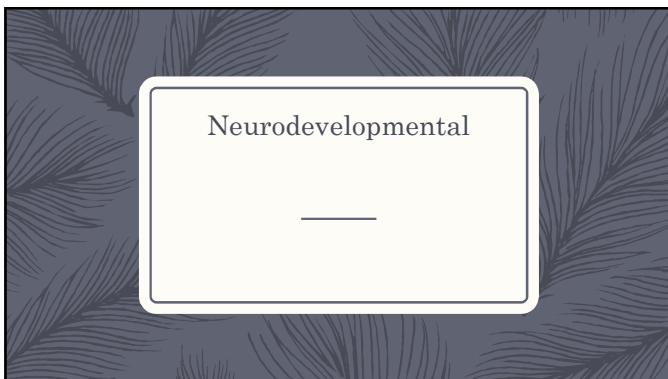
49



Social-Pragmatic Treatment

- Variety of approaches, modified for children with CAS
- Usually involved talking about social rules explicitly
- Individual and group therapy, usually led by SLP
- Often involves role-playing

50



Neurodevelopmental

51

ADHD

- Attention difficulty, hyperactivity and impulsiveness that interferes with ability to engage in daily life
- Consider child's age – not usually diagnosed until school age
- Signs:
 - Child never rests/always in motion/fidgets
 - Difficulty sustaining attention (for age-appropriate amount of time)
 - Constantly distracted
 - Highly impulsive/can't resist temptation
 - Accident prone/takes unnecessary risks
 - Sleep issues
 - Chicken or egg?

52


ADHD Treatment



- Diagnosed by a physician (including psychiatrist) or psychologist
- Behavior therapy and parent training for younger children
- Behavior therapy and medication for older children
- Lifestyle changes
 - Healthy diet
 - Adequate sleep
 - Limit screen time
 - Physical activity

53

Executive Functioning



- Mental processes that enable us to plan, focus attention, remember instructions, and juggle multiple tasks successfully.
- Includes
 - Working memory
 - Mental flexibility
 - Self-control
- Signs of deficits
 - Difficulty with organizing, planning, prioritizing, maintaining attention, task initiation, self-monitoring, impulse control, changing plans


54



Executive Functioning Treatment

- SLP can usually include in treatment
- Counselors and educators may also treat
- For older children, "coach" can be helpful

55



Autism

- Broad range of conditions characterized by difficulty in social interaction and communication and by restricted patterns of thought and behavior.
- "Autism isn't an illness. It's a different way of being human." (Barry Prizant)

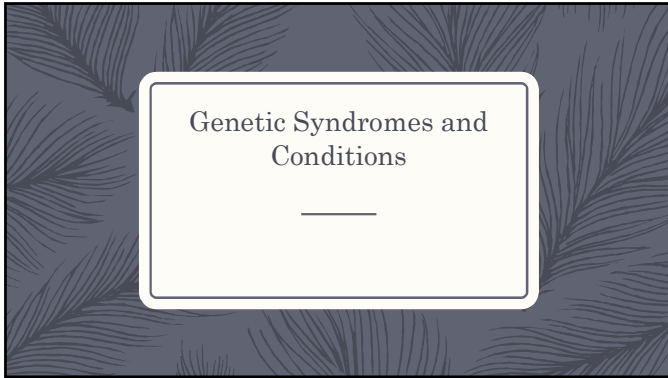
56



Therapy for Autism

- Diagnosed by a physician (medical), psychologist or diagnostician (school), often as part of a team
- Speech and language therapy
 - Focus on practical, functional goals that will improve the child's life
 - Don't forget about coaching family members and others about how to best facilitate interactions with the child
- Occupational therapy
 - Most children with autism have sensory differences
- ABA services typically recommended by medical professionals
 - Before you enroll in ABA, consider your goals for your child
 - Research who and how ABA will be implemented
 - Read/listen to information from autistic adults about their experiences

57



58

Genetic syndromes and conditions

- Many, many rare genetic disorders
- Diagnosed by a physician (geneticist) using genetic testing
- Some readily recognized at birth, others not diagnosed until later
- Metabolic disorders
 - Galactosemia
- Mitochondrial disorders
- Important to know if possible because there may be significant medical issues that can be treated


59

Some signs of genetic disorders

<ul style="list-style-type: none"> - ear abnormalities - unusually shaped eyes - different colored eyes - facial features that are unusual or different from other family members - brittle or sparse hair - excessive body hair - white patches of hair - large or small tongue - misshapen teeth 	<ul style="list-style-type: none"> - missing or extra teeth - loose or stiff joints - unusually tall or short stature - webbed fingers or toes - excessive skin - unusual birthmarks - increased or decreased sweating - unusual body odor
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Boston Children's Hospital
<https://www.childrenshospital.org/conditions/genetic-disorders>

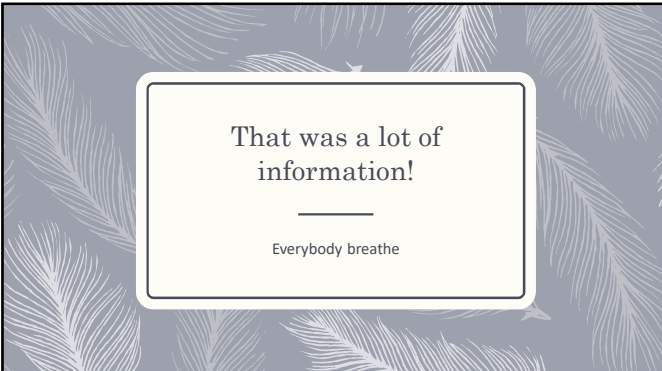
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Treatment for genetic disorders

- Talk to a genetic counselor
- Therapy, depending on challenges
 - Speech and language therapy
 - Occupational therapy
 - Physical therapy
- Treatment for specific medical conditions may include:
 - Surgery
 - Dietary changes
 - Medication

61




That was a lot of information!

—

Everybody breathe


62



Take Home Points

- Diagnosis of CAS alone doesn't warrant seeing neurologist, geneticist, etc
- Look at the whole child and impacts on their functioning
- Prioritize – what needs to be addressed the most?
- Take one step and one day at a time
- Give yourself grace!

63



References

- American Speech-Language-Hearing Association. (2007). Childhood apraxia of speech [Technical report]. Available from www.asha.org/policy#1.
- American Speech-Language-Hearing Association. (1993). Definitions of communication disorders and variations [Relevant Paper]. Available from www.asha.org/policy.
- American Speech-Language-Hearing Association Practice Portal on Childhood Apraxia of Speech: <https://www.asha.org/practice-portal/clinical-topics/childhood-apraxia-of-speech/> Available from www.asha.org/policy.
- American Speech-Language-Hearing Association Practice Portal on Articulation and Phonology: <http://www.asha.org/practice-portal/clinical-topics/articulation-and-phonology/>
- American Speech-Language-Hearing Association Practice Portal on Fluency: <https://www.asha.org/practice-portal/clinical-topics/fluency-disorders>
- Boston Children's Hospital <https://www.childrenshospital.org/conditions/genetic-disorders>
- Center on the Developing Child, Harvard University: <https://developingchild.harvard.edu/science/key-concepts/executive-function/>
- Cunningham, Greta (2020). Detective work and data help detect velopharyngeal incompetency (VPI). <https://www.gillettechildrens.org/stories/detective-work-and-data-help-detect-velopharyngeal-dysfunction-vpi>
- Strand, Edythe A. (2016). CAS Intensive Training Workshop Handout.

64

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Thank you!

65
