



Assistive Technology and Strategies to Mitigate Speech and Swallowing Impairments in Ataxia

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Attendees are encouraged to work with a licensed speech-language pathologist to find strategies and assistive tools that work for them.



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Topics for today:



Impacts of ataxia on speech and swallowing



Communication strategies, interventions, and assistive tools




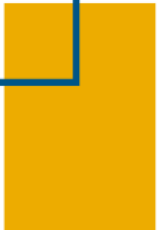
Swallowing strategies, interventions, and assistive tools



How does ataxia affect speech & swallowing?

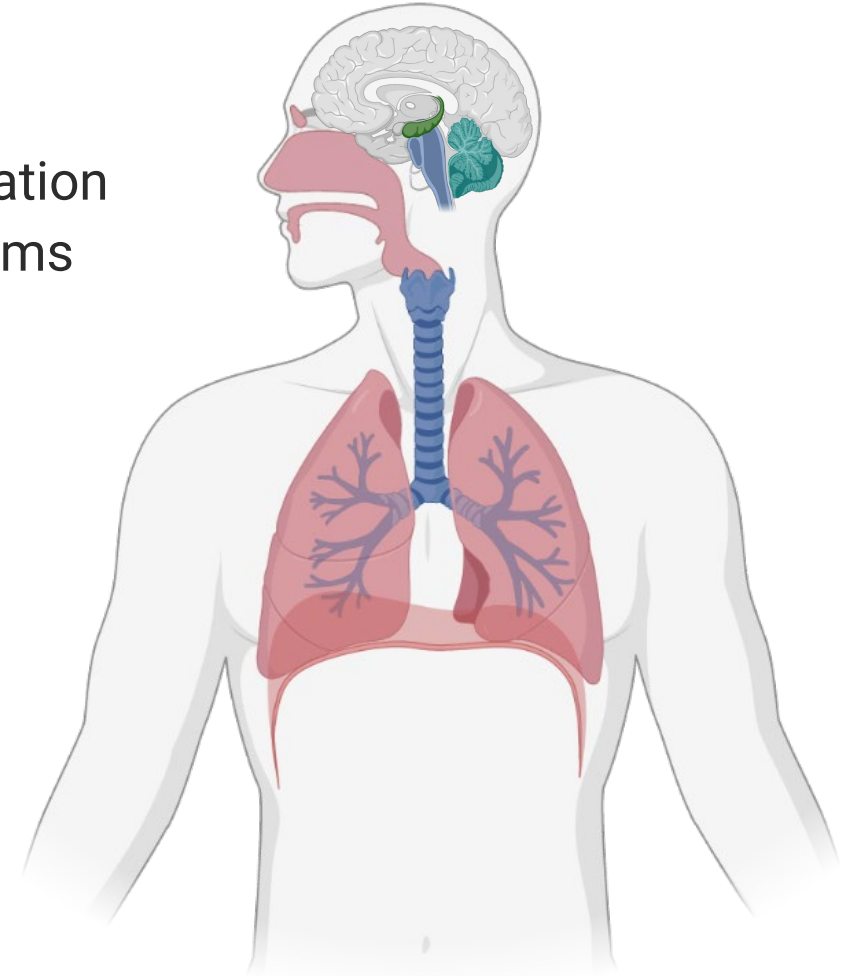


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Speech changes due to ataxia

- **Cerebellum → coordination of movement**
 - Ataxia is most often associated with incoordination
 - Some forms of ataxia may cause other symptoms (e.g., spasticity, weakness)
- **How might ataxia affect speech?**
 - Breath control
 - Voice production
 - Resonance
 - Articulation
 - Prosody (rate, rhythm, flow)



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What are some speech changes I may notice?

Breath and voice control

- Running out of air when speaking
- Variable pitch, loudness, & voice quality

Resonance changes

- Voice may intermittently sound too nasal (*hypernasal*), or less nasal than expected (*hyponasal – like when you have a cold*)

Articulation

- Inconsistent speech sound errors or distortions
- Sounds and syllables running together or collapsing

Prosody

- Changes in the rate, rhythm, and flow of speech
- Sounds and syllables may be prolonged or shortened

Overall

- A perception of “slurred”, imprecise, or inefficient speech
- Changes in how well your speech is understood by others

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Swallowing changes due to ataxia

- **Cerebellum → coordination of movement**
 - Ataxia is mostly associated with **incoordination**
 - Some forms of ataxia may cause other symptoms (e.g., spasticity, weakness)
- **How might ataxia affect swallowing?**
 - *Before the swallow:* using utensils and cups
 - Control of food and drink in the mouth
 - Coordination of breathing and swallowing
 - Effective closure of the airway during the swallow
 - Timing of the swallowing sequence as a whole



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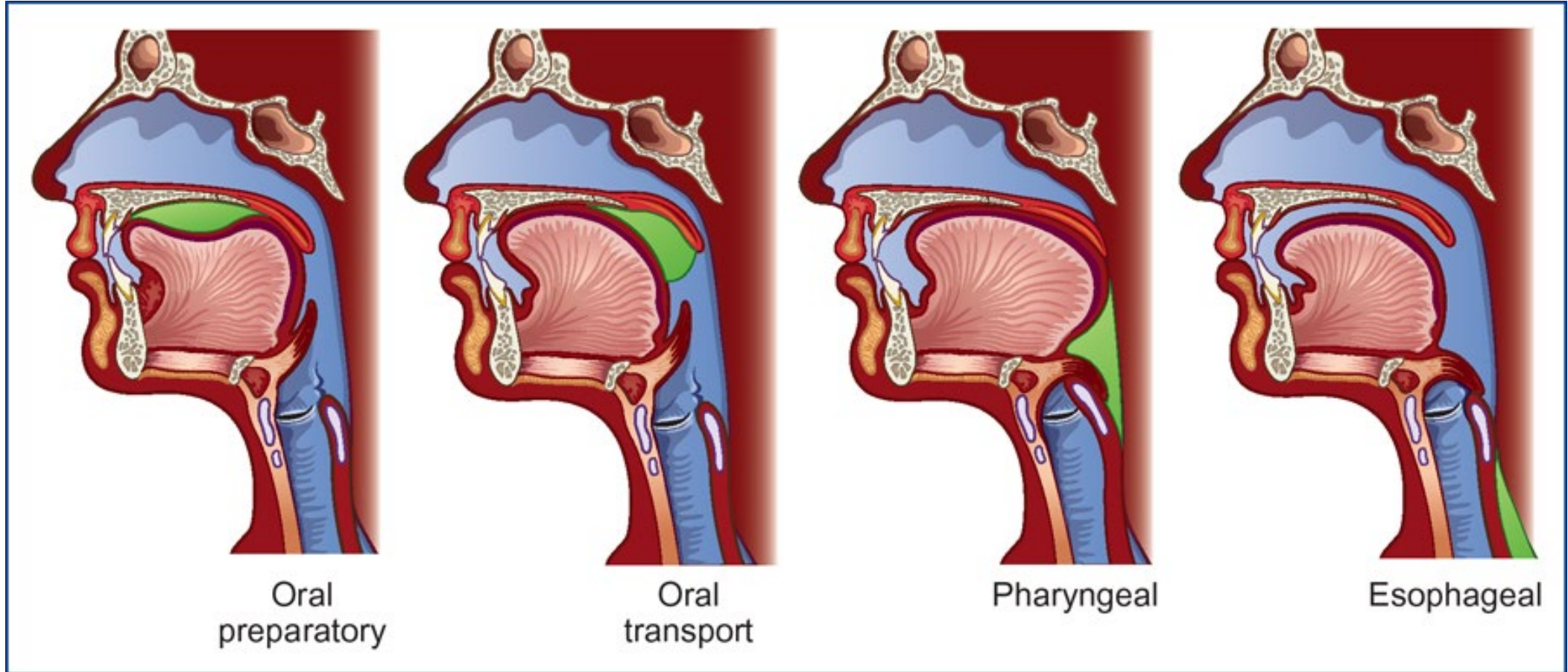


Figure 16-5, <https://entokey.com/swallowing-2/>



What does a typical swallow look like?



What can it look like when things go wrong?

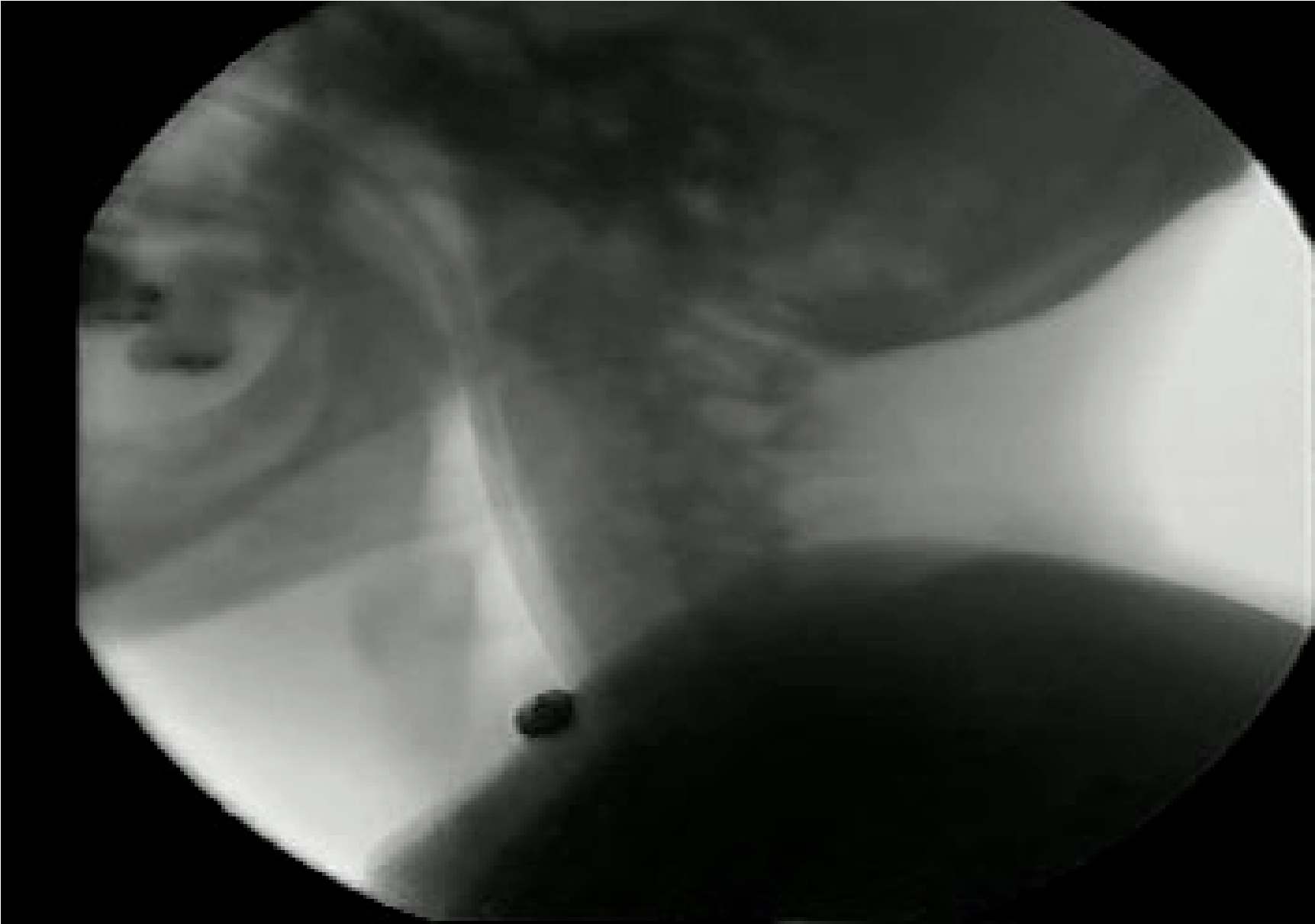
Normal Swallow





Abnormal Swallow



What can it look like when things go wrong?


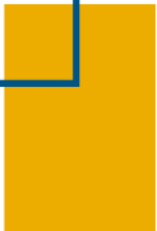




Speech Language Pathology Services *(Speech Therapy)*



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Speech Therapy: Overview

- **Evaluation**

- Office visits
- Swallow studies

- **Individualized treatment**

- Rehabilitation
 - Improving, optimizing, and/or maintaining function
 - Lots of practice!
- Compensation
 - Developing strategies to support communication and swallowing
 - Often incorporated to reduce the **impact** of an impairment on one's daily life
 - Includes the use of assistive technology & adaptive tools
- Family & caregiver training



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Speech Therapy: Examples of Treatment Targets

Speech

- **Rehabilitation**

- Improved control over breathing and voicing patterns
- Improved coordination of lip, jaw, and tongue movements
- Adjusting speaking patterns for rhythm / flow
- Must target the underlying problem – *strengthening exercises won't improve coordination!*

- **Compensation**

- In-the-moment strategies (e.g., *slow rate, over-articulation*)
- Augmentative and alternative communication systems & supports





Speech Therapy: Examples of Treatment Targets

Swallowing

- **Rehabilitation**

- Training **movement patterns** to improve coordination
- Using **targeted exercises** to address impairments

- **Compensation**

- Adjusting the environment
- Altering food and liquid consistencies and sensory characteristics (*e.g., taste, temperature*)
- Adjusting posture and head position (*e.g., chin tuck, head turn, head tilt*)
- In-the-moment strategies (*e.g., effortful swallow, double swallow, alternating food/drink*)
- Mindfulness / intentionality strategies
- Use of adaptive equipment to make eating and drinking easier



Assistive Technology & Adaptive Equipment



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Augmentative & Alternative Communication (AAC)

No-tech

- Gestures
- Body language
- Facial expressions
- Sign language

Light- and mid-tech

- Writing
- Drawing
- Boards & books
 - *Alphabet*
 - *Words/pictures*
- Battery-operated devices with speech output

High-tech

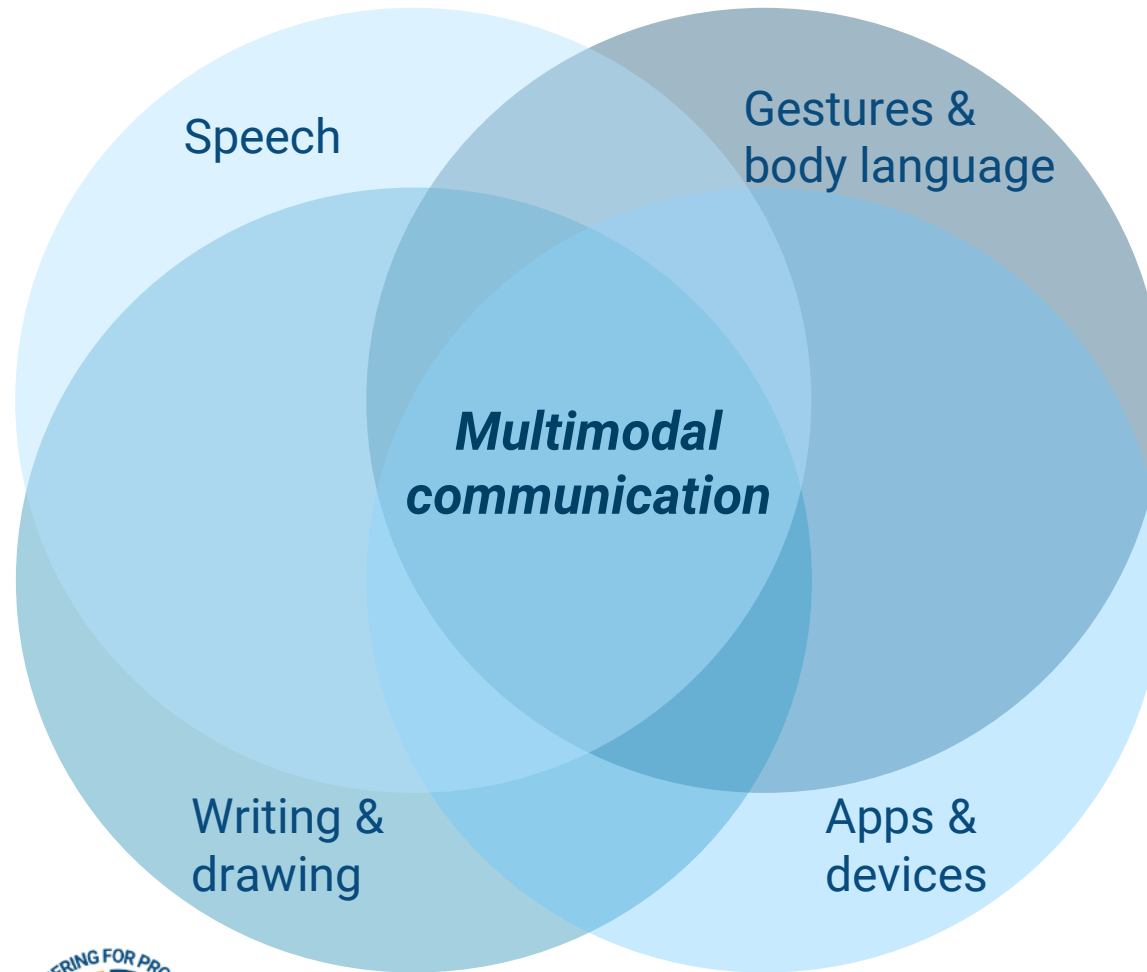
- Speech-generating devices
 - *Voice banking*
 - *Message banking*
- Apps for tablets and smartphones
- Text-to-speech (*and speech-to-text*)



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Augmentative & Alternative Communication (AAC)



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Augmentative & Alternative Communication (AAC)

- **AAC Systems**

- **Any tool(s)** that support communication
- Can serve as one's **primary** way to communicate
- Can also be used to **augment** speech or as a tool for specific situations
- Range from simple to complex
- Various price points

- **Some challenges associated with ataxia**

- **Access:** how a system is manipulated (*e.g., touch, eye tracking, head pointing*)
- **Portability:** ease of transporting, carrying, and using the system
- **Changes in function:** progression of ataxia may impact the types of supports that work for you



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Voice Banking / Message Banking

- **Voice banking**

- The process of recording the individual's speech to create a synthetic voice that approximates their natural voice
- Allows the user to continue to produce new messages over time in a voice that sounds like theirs
- **4-6 hours** of recording time

- **Message banking**

- The process of recording personally selected messages in your own voice and inflection that can be uploaded to an AAC device and played at a later time

- **“Double dipping”** *(developed by John Costello at BCH)*

- Allows you to use your message banked messages to create a synthetic voice



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Voice Banking / Message Banking

- **Several voice / message banking platforms are available**
 - Acapela my-own-voice
 - Model Talker
 - VocalID
 - The Voice Keeper
 - Cereproc Cerevoice Me
 - My Message Banking (*from Boston Children's Hospital and Tobii Dynavox*)
- **It is best to start voice banking or message banking early, but the need to use these options depends on:**
 - The anticipated progression of your type of ataxia
 - Your communication needs, goals, and values



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What might AAC systems look like?



family	friends	feelings	schedule				
home	1	A	B	C	D	YES	NO
food	2	E	F	G	H	?	😊
clothing	3	I	J	K	L	M	N
weather	4	O	P	Q	R	S	T
you	5	U	V	W	X	Y	Z
	6	7	8	9	0	⊗	SPACE

Topic board from Aphat!
Letter board from AlphaTopics AAC app by Tactus Therapy Solutions Ltd. © 2015. tactustherapy.com



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Phone & Tablet Applications

- Not typically covered by insurance
- Quickly accessible
- Free and low-cost options
- Fewer features / less customizable
- See resources page (link / QR code at end of presentation) for examples and tutorials



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Dedicated Communication Devices

- **High-tech devices and equipment are mostly paid for by insurance**
 - Cost will vary based on details of insurance coverage
 - Requires a physician visit and an SLP evaluation with documentation demonstrating “*medical necessity*” for the **specific device** being requested
 - Equipment needs (*e.g., device mount, key guard, carrying strap*) must be documented
 - AAC devices are considered durable medical equipment (DME)
- **If insurance denies certain features or accessories, individuals can:**
 - pay out-of-pocket
 - request equipment upgrades later (*e.g., with disease progression*)
- **Alternative funding sources are available** (*see resource page*)



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General Recommendations

- **First and foremost, remember:**
 - All forms of communication are valid
 - Communication is a two-way street
- **Start exploring your options and find an SLP to work with**
 - Find easy, light-tech options as a starting point
 - Explore accessibility features on your electronic devices
 - Consider trying out a free or low-cost communication app on your phone
 - Connect with an AAC specialist
 - Discuss your prognosis with your doctor and therapist so you can make informed decisions about long-term communication supports
 - Multimodal communication is often the most successful



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Adaptive equipment for swallowing

- **FIRST:** be sure to see an SLP for a swallowing evaluation!
- **Diagnostic imaging** is essential for guiding care
- Treatment strategies must be tailored to the individual



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Adaptive equipment for swallowing

- Thickening agents
- Bolus monitoring cups
- SafeStraw
- Adapted utensils
 - ELISpoon
 - LiftWare spoon
 - Weighted utensils
- Adapted tableware
 - Eatwell Assistive Tableware Set
 - Meal Lifter
- Cut-resistant safety gloves



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General Recommendations

- **SLP evaluation** for any concerns about your swallowing
- **Occupational therapy evaluation** if you primarily have trouble using cups and utensils
- **Work with your physician(s)** to manage allergies and acid reflux



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General Recommendations

- **Keep a journal of your symptoms** to share with your SLP / physician
 - *Is swallowing better at certain times of the day?*
 - *Do you have trouble with food, liquids, saliva, pills, or a combination?*
 - *What are your symptoms? How often do they arise?*
 - *Does anything make the problem worse? Do any strategies or types of food/drink make it better?*
- **There are some basic strategies you can try at home, but nothing beats an individualized evaluation and treatment plan!**
 - Some compensatory strategies can be **HELPFUL** to some, yet **HARMFUL** to others (*e.g., chin tuck*)
 - Targeted treatment can go beyond compensation to **improve or optimize** function
 - An individualized treatment plan will account for your **personal goals, values, and preferences**



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General Recommendations

- **Simple strategies you can try:**

- Eat and drink at a slow pace (*one bite/sip at a time*)
- Take breaks if you feel short of breath
- Try alternating bites and sips
- Sit upright while eating and drinking (*rather than reclining*)
- If you have trouble with pills, try taking them with yogurt, pudding, or *applesauce* (*instead of liquids*)
- If you have acid reflux, try to stay upright for 30-60 minutes after meals
- Talk to your physician about products to manage saliva, mucus, and acid reflux



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Summary & Recommendations

More research is needed about treating speech and swallowing impairments in people with ataxia. However:

- Know that some types of ataxia will cause more severe speech and swallowing difficulties. Other types will cause only mild difficulties. Speak with your doctor about your prognosis so you can decide what's right for you.
- If you have any concerns about your speech / swallowing, see a speech-language pathologist for an evaluation.
- There are a variety of strategies and tools that can be used to improve speech and swallowing at various stages of disease progression.
- Insurance may help pay for communication devices and adaptive tools. However, other funding options are available if you need support.



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Contact

I'd love to hear from you!

Please contact me at if you have any questions or if you are interested in participating in future research related to speech and swallowing in ataxia.

I am currently conducting a survey to learn more about how people with ataxia experience and navigate swallowing difficulties. People with ataxia and caregivers can participate. Learn more here:

<https://sisc.unl.edu/ataxia-survey/>



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**SENSORIMOTOR INTEGRATION
FOR SWALLOWING AND
COMMUNICATION**

Scan for resources:



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