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Treatment Approaches and Techniques for Speech Sound Disorders

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Special Thanks to Shelley Myers, Shyla Miller, and the SSD team at CCHMC

Agenda

- Purpose and Learner Outcomes
- ASHA Policy
- Considerations for Therapy
- Basic Overview of All Pathways
- Universal Practices
- Pathway Details
  - Case Study
  - Videos
  - Treatment Techniques
  - Activity Ideas
- Resources

Purpose

- Provide a framework for treatment
  - Appropriate?
  - Effective?
- Treatment approach based on presentation
  - Mild vs Profound
  - Making progress

Learner Objectives

After this course, participants will be able to:

- Describe at least 3 therapy techniques.
- Define specific characteristics of mild to profound speech sound disorders.
- Explain how to apply effective speech therapy techniques for typical speech sound disorders

ASHA's Policy

- In an effort to align with the WHO framework, SLP intervention services should encompass the following:
  - Build on an individual's strengths
  - Address weaknesses that affect articulation and phonology
  - Assist the individual in acquiring new speech production skills and strategies
  - Do what you can to reduce barriers to successful communication
  - Provide necessary and appropriate accommodations and support. Teach the individual how to use the accommodations.
  - Intervention is expected to result in improved abilities, functioning, and participation.
  - Intervention may result in additional recommendations or referrals.

(American Speech-Language-Hearing Association, 2004)

Considerations for Therapy

- Family dynamics
- The Child
- Other considerations

Considerations for Therapy: Family

- What are the family's concerns/goals?
- What are their reasons for bringing the child to the evaluation or therapy appointment? (i.e., child is unintelligible, family member or teacher expressed concerns, child is embarrassed or frustrated by sound errors, etc.)
- What is the family's level of readiness and motivation?
- Does the family recognize the speech sound errors?
- Does the family have time to commit to therapy and a home program?
- Is the family advocating for therapy now, or do they like the idea of "waiting?"
- Does the family understand typical developmental errors for their child's age?
- Therapists may need to educate the family on the appropriateness of direct treatment verses a "wait and see" approach.

Considerations for Therapy: Child

- What is the child's level of stimulability for the sound(s) in error?
- Is the child able to establish correct placement?
- Does the child already have correct sound production in certain positions of words but not others (e.g. medial /s/ but not initial /s/)?
- How consistent is the error? If correct production is inconsistent, the sound may be developmentally emerging.
- If the child is not stimulable for the sound then the error is unlikely to change without treatment.
- What is the child's overall developmental level?
- What is the child's attention span?

Considerations for Therapy: Child

- Will child be able to participate in therapy?
- What is the child's willingness to repeat sounds and words?
- What are the child's language skills?
- Can the child follow directions?
- Are expressive language deficits interfering with intelligibility?
- What is the child's cognitive level?
- Does the child understand tongue placement directions?

Considerations for Therapy: Child

- Will the child be able to carry-over skills into less structured activities?
- Is the child able to discriminate correct vs incorrect sound productions?
- What is the child's level of motivation?
- Is the child aware of the speech sound errors?
- Is the child frustrated by the speech sound errors?
- Is the child embarrassed by the speech sound errors?
- What is the social impact – Is the child teased by peers?
- How significantly do the sound error(s) affect the child's overall intelligibility?
- Are the errors just noticeable distortions or do family and friends have a hard time understanding the child?

Considerations for Therapy: Other Factors

- Has the child's hearing been formally tested?
- Are there any other languages spoken in the home? Has the child been exposed to speech sounds from another language?
- What is the child's grade? (pre-kindergarten versus kindergarten versus third grade)
- What is the probability the child will self-correct naturally without intervention?
- Is the child already in therapy for other reasons that could affect progress? (speech for language, OT, PT, etc.)

Considerations for Therapy: Other Factors

- Does the child have normal dentition (e.g., open bite, missing teeth). Is a referral to oral motor evaluation appropriate?
- Does the child use a pacifier? Does the child suck a thumb/fingers? Should the family be encouraged to wean the child from these behaviors?
- Is there a family history of speech sound disorders?
- What was standard score? A standardized test score can help determine the severity of errors.
- Will "waiting" make it more difficult for the child to "break the pattern" and correct?

What is a pathway?

- Guide for decision making
- Evidence-based
- Leads to efficient and effective change

Pathways Overview

"Treatment decisions should be influenced the most by the changes that occur in client behaviors and that these changes should be empirically validated by demonstrating that the treatment provided, not some other variable, was responsible for the behavioral change" (Kamhi, 2006).

- Mild
- Moderate-Severe
- Profound

Universal Practices

- Auditory Awareness
  - Bombardment
  - Amplified listening
  - Phonological/phonemic awareness
  - Naturalistic experiences

Universal Practices – Video 1

Universal Practices

- Prompts/Cues/Feedback
  - Visual
  - Tactile
  - Gestural
  - Auditory/verbal
  - Knowledge of performance
  - Knowledge of results
  - Feedback rate
  - Timing

Universal Practices – Video 2

Universal Practices

- Generalization
  - What has worked for you?

Universal Practices

- Generalization
  - Functional words (and phrases)
  - Natural Contexts
  - Different environments
  - Different communication partners

Universal Practices – Video 3

Universal Practices

- Generalization
  - Self-awareness
  - Self-monitoring
  - Self-corrections

Universal Practices

- Generalization Activities
  - Play with the little people house and act out play schemes that incorporate target vocabulary
  - Restaurant and have items on the menu that have target sound
  - Pretend to have a birthday party and open presents with target sounds
  - Make a wand with the target sound on the top and the child will turn the clinician into something that has their target sound-can use this with the magic castle
  - Grocery Store and buy items with target sound
  - Train has to pick up and deliver items with target sound.
  - Vehicles are going to different stores that have the child's target sound

Universal Practices – Video 4

Universal Practices – Video 5

Gestural Speech Cues

- Technique for SLPs and Caregivers
  - Visual
  - Tactile
- What gestures do you use?

Gestural Speech Cues – Video 6

Gestural Speech Cues – Video 7

Pathways Decision Making Matrix

	Mild	Moderate-Severe	Profound
Number of Errors	1 to 2	3 or more	3 or more
Intelligibility	Fair to good	Poor	Poor
Stimulability	Good	Fair to Good	Fair
Consistent Errors	Yes	Yes	No
Vowel Errors	No	No	Yes
Typical Developmental Errors	Yes	Yes	No

Mild Pathway

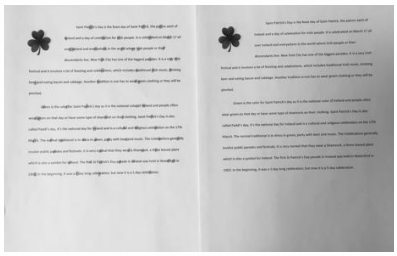
	Mild	Moderate-Severe	Profound
Number of Errors	1 to 2	3 or more	3 or more
Intelligibility	Fair to good	Poor	Poor
Stimulability	Good	Fair to Good	Fair
Consistent Errors	Yes	Yes	No
Vowel Errors	No	No	Yes
Typical Developmental Errors	Yes	Yes	No

Mild Pathway: Major Influences

- Traditional Approach (Secord, 1989)
  - Isolation
  - Nonsense syllables
  - Words
  - Phrases
  - Sentences
  - Conversation
- Traditional Approach (Van Riper, 1939)
  - Sensory-Perceptual Training
  - Production Training for Sound Establishment
  - Production Training for Sound Stabilization
  - Transfer and Carryover training
  - Maintenance of learned behaviors across time

Mild Pathway: Target Selection

- Sounds are often targeted individually in a progressive hierarchy of linguistic complexity
  - Isolation
  - Syllables
  - Words
  - Phrases
  - Sentences
  - Reading
  - Conversation



- Sounds are often targeted separately in the initial, medial, and final positions of words

Mild Pathway

- Target selection is based on
  - stimulability
  - developmental norms
  - errors
- Goal advancement
  - mastery based on a percentage of accuracy
  - mastery of one sound prior to next
- Child will produce /L/ in the initial position of words given no cues with 80% accuracy.

Mild Pathway: Case Study

- Female, Age 5
- Intelligible but noticeably different
- "2 errors"
- Good stimulabilty
- Consistent
- No vowel distortions
- Developmental errors

Sound	Initial	Medial	Final
/g/	d	d	d
/k/	t	t	t
/L/	w	w	omit
/r/	w	w	ə
/th/ voiced	d	d	d
/th/ voiceless	f	f	f

Mild Pathway: Case Study – Video 8

Mild Pathway: Activity Ideas

- I like it I don't like it
- Lift the flap books – I see, I found
- Literature based repetitive books
- Trash Talk (Crazy Speech World)
- Sound Jars
- Sound Books

Mild Pathway: Activity Idea Video 9

Moderate-Severe Pathway

	Mild	Moderate-Severe	Profound
Number of Errors	1 to 2	3 or more	3 or more
Intelligibility	Fair to good	Poor	Poor
Stimulability	Good	Fair to Good	Fair
Consistent Errors	Yes	Yes	No
Vowel Errors	No	No	Yes
Typical Developmental Errors	Yes	Yes	No

Moderate-Severe Pathway: Major Influences

- Many different types of therapy techniques (Baker and McLeod, 2001)
  - Maximal Oppositions (Goldstein & Gierut, 1998; Barlow & Gierut, 2002)
  - Minimal Contrasts (Ferrier & Davis, 1973; Weiner, 1981)
  - Cycles (Hodson & Paden, 1983; 1991)

http://www.asha.org/Practice-Portal/Clinical-Topics/Articulation-and-Phonology/

Moderate-Severe Pathway: Target Selection Maximal Oppositions

- Maximal oppositions
  - Non-stimulable
  - Later developing
  - Differences in place-voice-manner
- Examples:
  - θ/L r/p r/s
  - tʃ/b s/g L/f ʃ/b

(Goldstein & Gierut, 1998; Barlow & Gierut, 2002)

Maximal Oppositions

Maximal Oppositions

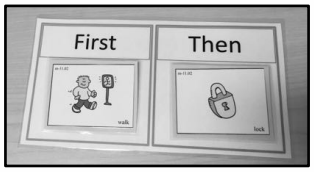
Phases

1. Imitation
   - Produce target following model 75%
2. Spontaneous
   - Independent target at 90%

Moderate-Severe Pathway: Target Selection Minimal Contrasts

- Minimal
  - Stimulable for target sound (Lowe, 1994)
  - Word pairs that differ by only one feature
  - By establishing contrasts between two sounds will lead to generalization to other sounds within the same sound class after developing
  - Examples:
    - t/s
    - p/f

    (Ferrier & Davis, 1973; Weiner, 1981)



Minimal Pairs – Video 10

Minimal Contrasts

- Intelligibility should take priority
- Session Structure
  - Introduce targets
    - Key vs Tea
  - Discrimination testing/training
  - Production training
  - Carryover training

(Blanche, 1981; Ferrier & Davis, 1973; Weiner, 1981)

Minimal Pairs – Video 11

Moderate-Severe Pathway: Target Selection Cycles

- According to Hodson and Paden (1991), you can pick target phonemes based on the following hierarchy:

- Primary Targets initial cycles:
  - Syllableness (1 vs. 2 syllables)
  - Initial Consonants
  - Final Consonants
  - Posterior-Anterior Contrasts (velars/alveolars)
  - /s/-Clusters
  - Liquids
- Secondary Targets during later cycles:
  - Voicing Contrasts (voiced/unvoiced)
  - Vowel Contrasts
  - Singleton Stridents (/s/, /f/, /sh/, voiceless-/th/, /z/, /v/, voiced-/th/)
  - Other consonant clusters
  - Other Miscellaneous Errors

Moderate-Severe Pathway: Cycles Session Structure

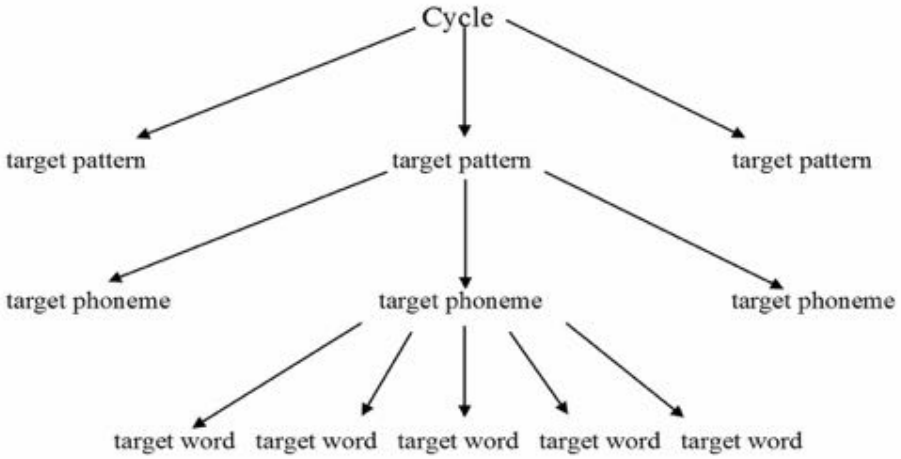
- Session Structure
  - Review – review prior week's practice words
  - Auditory Bombardment
  - Target Word Cards
  - Optional auditory discrimination training
  - Practice Production
  - Stimulability Probing
  - Auditory Bombardment
  - Home Program

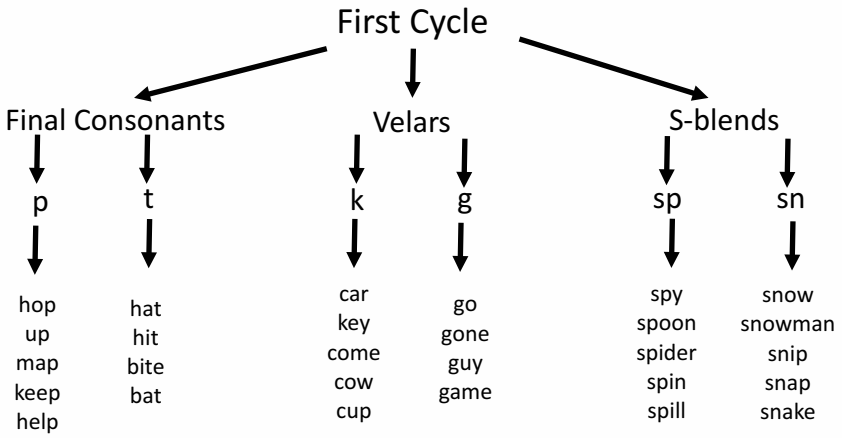
(Pena-Brooks & Hedge, 2007)

What are typical cycles?

- Cycle 1
  - Primary targets
  - Some or all target phonemes
- Cycle 2
  - Primary targets
  - New target phonemes
  - Secondary targets
- Cycle 3+
  - What is the child still having difficulty with?

What is a cycle??





Moderate-Severe Pathway: Cycles

- Target Selection
  - Primary targets for first cycle
  - Secondary targets for later cycles
- Goal advancement
  - pre-set cycles

(Hodson & Paden, 1991)

Moderate-Severe Pathway: Case Study

- Male, 4 years old
- Poor intelligibility
- 3+ errors
- Good stimulabilty
- Consistent
- No vowel distortions
- Developmental errors

Sound	Initial	Medial	Final
/p/			Omit
/b/			Omit
/t/			omit
/d/			omit
/g/	d	d	omit
/k/	t	t	omit
/f/	t	t	
/v/	b	t	
/th/ voiced	d	d	d
/th/ voiceless	f	f	f
/L/	W	W	omit
/r/	w	w	ə
/sp/	p		
/sm/	m		
/st/	t		

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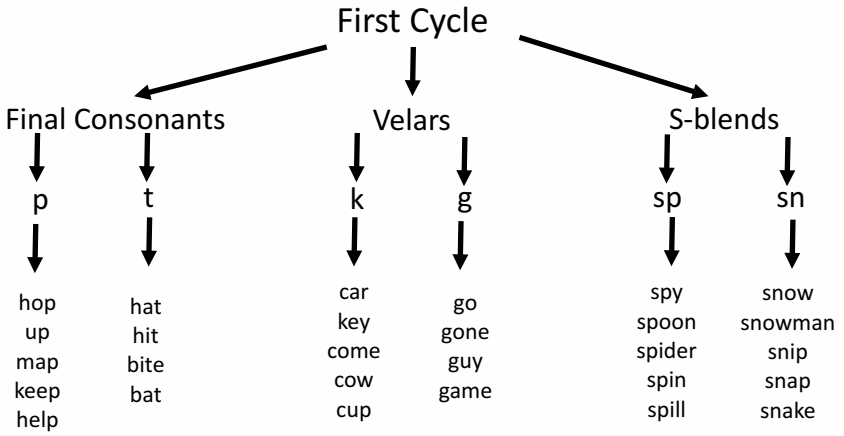
Moderate-Severe Pathway: Case Study

- Male, 4 years old
- a severe phonological disorder
  - final consonant deletion
  - velar fronting
  - cluster reduction
  - inconsistent voicing errors
  - stops fricatives including /f/ and /v/.

Moderate-Severe Pathway: Case Study

- Cycle 1 Target Phonological Patterns and Phonemes:
  - Final Consonants
    - /p/ - hop, up, map, keep, help
    - /t/ - hat, hit, bite, bat
  - Velars - /k/, /g/
    - /k/ - car, key, come, cow, cup
    - /g/ - Go, gone, guy, game
  - /s/-blends
    - /sp/ - Spy, spoon, spider, spin, spill
    - /st/ - Stop, stay, still, step



Moderate-Severe Pathway: Case Study

- Cycle 2 Target Phonological Patterns and Phonemes:
  - Velars - /k
    - Initial /k/ - cat, cute, cut, Kate
    - Final /k/ - bike, lock, book, look, took
  - /s/-blends
    - /sm/ - smile, small, smart, smell
    - /sn/ - snow, snowman, snip, snap, snake
  - 3 syllable words
    - Ohio, elephant, potato, animal, bicycle

Moderate-Severe Pathway – Video 12

Backward Chaining

- Work backwards with target
  - Working backward from end of word
  - Can be applied to larger contexts

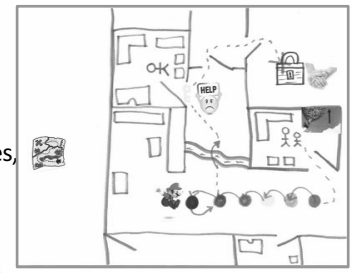
Moderate-Severe Pathway – Video 13

Moderate-Severe Pathway: Case Study

- Cycle 3 Target Phonological Patterns and Phonemes:
  - Velars – mixed /k/
    - Mixed /k/ - cook, cake, kangaroo, kiss
    - Final /k/ - bike, lock, book, look, took
  - /s/-blends
    - /sk/ - skate, ski, scary, scarf, sky
  - Singleton Stridents
    - /f/ - four, five, fish, find
    - /f/ - fire, firetruck, fireman, fight, first

Moderate-Severe Pathway: Activity Ideas

- Use target words to guide activities
- /p/ - hop, up, map, keep, help
  - Make a realistic map with target word pictures, place pictures around the area and hop on them
- /k/ - car, key, come, cow, cup
  - Color picture cards of target words, drive cars over picture cards, make a cow drink from a cup, hide pictures under a cup and guess what they are – hide and seek with picture cards
- /sp/ - Spy, spoon, spider, spin, spill
  - Play I spy, spin around then race across the room with a spider on a spoon being careful not to spill



Profound Pathway

	Mild	Moderate-Severe	Profound
Number of Errors	1 to 2	3 or more	3 or more
Intelligibility	Fair to good	Poor	Poor
Stimulability	Good	Fair to Good	Fair
Consistent Errors	Yes	Yes	No
Vowel Errors	No	No	Yes
Typical Developmental Errors	Yes	Yes	No

Profound Pathway: Integral Stimulation

Treatment hierarchy

1) Production simultaneous with the therapist
2) Production post clinician model, clinician mouths production while child produces
3) Production post clinician model given cues
4) Production post clinician model
5) Production elicited without a model
6) Production in less structured, naturalistic contexts

(Gildersleeve-Neumann, C, 2007)

Profound Pathway: Integral Stimulation

Integral Stimulation

Establishing the target → more support

Generalizing the target → decreased support

Profound Pathway

- What is the goal?
  - Can the child produce the target?
  - Can the child produce the target in therapy but not at home?
  - What happens when you change the context of the target?

Profound Pathway: Motor Learning Theory

- **Distribution of practice:** spread of trials across time
  - **Mass:** longer less but less frequent practice
  - **Distributed:** shorter but more frequent practice

(Strand & Skinder, 1999)

Profound Pathway: Motor Learning Theory

- **Variability:** varying the target phoneme, target position, syllable complexity, or target context
  - **Constant:** practice same target in same context (e.g., targeting CVCV words only).
  - **Variable:** practice different targets and/or different contexts (e.g., targeting multiple phonemes at the same time, targeting phoneme in different positions such as initial, final, and medial, and targeting phoneme within different linguistic contexts such as within words phrases or sentences).

(Wulf & Schmidt, 1997)

Profound Pathway: Motor Learning Theory

- Variability
  - Syllable shape (CV1CV2) – baby, mommy, daddy
  - Suprasegmental characteristics – rate, loudness, inflection

Profound Pathway: Motor Learning Theory

- **Schedule:** how you practice the targets
  - **Block:** separate and successive blocks or phases
    - targeting CVCV for 20 minutes and then targeting VC words for 20 minutes
  - **Random:** randomly distribute targets within session, should be an unpredictable pattern
    - targeting CVCV and VC words randomly throughout

(Schimdt & Wrisberg, 2004)

Profound Pathway: Motor Learning Theory

Feedback

- **Knowledge of Performance** – clinician provides specific information about how the sound was produced
  - You put your lips together for that sound /m/.
- **Knowledge of Results** – clinician provides feedback about whether a target was produced correctly or incorrectly
  - You said /m/ correctly

Profound Pathway: Motor Learning Theory

- **Feedback Rate** – consistent versus less frequent
- **Feedback Timing** – immediate versus delayed

(Gildersleeve-Neumann C, 2007)

Profound Pathway: Target Selection

- Based on syllable complexity
- Child's production of various syllable shapes should be analyzed in order to determine targets
- V
- CV
- CVCV
- CV1CV2
- C1V1C2V2
- CVC

(Jacks, Marquardt, and Davis, 2006)

Profound Pathway: Case Study

- Female, 6:1
- Childhood Apraxia of Speech
  - Poor intelligibility and stimulability
  - Receptive and expressive language deficits
  - 3+ errors
  - Inconsistent errors
  - Abnormal prosody (monotone, choppy)
  - Atypical errors (e.g., sound additions top/car, dowp/down)
  - Difficulties with placement
  - Vowel distortions

Profound Pathway: Case Study – Video 14

Profound Pathway: Use of AAC

Augmentative and Alternative Communication

- Does not inhibit spoken communication
- Facilitates verbal speech
- Reduces frustration

(Millar, Light, & Schlosser, 2016; Parsons & La Sorte, 1993; Scholosser & Wendt 2008).

Profound Pathway:
Case Study – Video 15

Profound Pathway:
Use of AAC – Video 16

Profound Pathway:
Use of AAC – Video 17

Profound Pathway:
Backward Chaining – Video 18

Profound Pathway: Activity Ideas

- Eliciting functional and high frequency phrases (e.g., I don't know, I need help, I see, I want).
- Repetitive activities targeting specific syllable shape (e.g., I have blue **money**).

Profound Pathway: Activity Ideas

- Core vocabulary

Conclusion

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